Public Comments (2024)

AURORA AIRPORT MASTER PLAN

All emails, letters, calls outside of meetings are included in this document for 2024 only; other years are included in separate documents to minimize the document size/length. PAC meeting conversations and questions, as well as emails sent specifically regarding the meetings can be found in the PAC meeting summaries. Comments during Public Open Houses can be found in the Open House summaries.

Please note: Emails and documents are listed alphabetically by last name, then date (from January to December for 2024).

2024

Last Name	First Name	Date of Comment	Received Through	Subject Line
Altemus	Robert	12/20/2024	Website comment	NA
Andrews	John	06/16/2024	Email	Opposition to expansion of Aurora State Airport
Ausland	Chelsea	06/12/2024	Website comment	NA
Bakke	David	11/01/2024	Email	Aurora Airport master plan
Barlow Lind	Pamela	02/12/2024	Email	ODA PAC Membership Roster
Baymor	Jeff	03/12/2024	Email	Anti-terrorism Measures
Baymor	Jeffrey	08/16/2024	Website comment	NA
Bennett	Bruce	04/30/2024	Website comment	NA
Bennett	Bruce	05/14/2024	Website comment	NA
Bennett	Bruce	06/11/2024	Email; Attachment	Email: Fwd: lot line Attachment: lot line.pdf
Bennett	Bruce	06/17/2024	Website comment 1; Website comment 2	NA
Bennett	Bruce	10/29/2024	Email	Aurora Airport Master Plan
Bennett	Bruce	12/16/2024	Email; Attachment	Email: Aurora Airport Master Plan Attachment: Marion County APN Document
Bennett	Bruce	12/23/2024	Email	PAC input Aurora Master Plan
Bennett	Leann	06/13/2024	Email	Complaint about Aurora State Airport
Beyers	Randal	11/10/2024	Email	The Aurora Airport master plan
Bieganski	Jonathan	12/23/2024	Email	Urgent Input on Aurora Airport Master Plan

Bieganski	Kathleen	12/18/2024	Email	Aurora Airport Master Plan
Brenneke	Stephen	11/13/2024	Website comment	NA
Brenneke	Stephen	11/18/2024	Website comment	NA
Brenneke	Stephen	12/18/2024	Email	Refined Prelim Alternatives
Brownlee/Helbling	Trent/Tony	12/10/2024	Email	UAO PAC Alternate Request
Buley	George	12/23/2024	Website comment	NA
Burch	Matt	12/22/2024	Email	Aurora airport master plan
Buss	Jonathan	11/14/2024	Email	IN OPPOSISTION Current Aurora Airport Master Plan
Clayton	Ben	10/09/2024	Email	Re: Aurora PAC membership
Clayton	Ben	12/23/2024	Email; Attachment	Email: RE: Aurora PAC Meeting 8 follow up Attachment: Re: Aurora State Airport Master Plan Proposed Preferred Alternative Letter
Conroy	Trevor	06/12/2024	Website comment	NA
Crouch	Don	06/28/2024	Website comment	NA
Cummings	Zachary	11/14/2024	Email	Regarding the Aurora Airport master plan that is currently underway
Davis	Ted	11/14/2024	Website comment	NA
Davis	Ted	12/18/2024	Email	Opposition to proposed hangar destruction
Dierks	John	11/08/2024	Email	Aurora Airport Master Plan
Enger	Dallas	11/01/24	Email; Attachment	Email: Aurora Airport master plan Attachment: Letter
Faegre	Aron	09/03/2024	Email; Attachment	Email: Aron Faegre Submission to ODAV and JLA- Input for Aurora State Airport Master Plan Attachment: UAO Proposed Modification of Runway Object Free Area (ROFA) Design Standards
Faegre	Aron	12/23/2024	Email; Attachment 1; Attachment 2	Email: Aron Faegre master plan comments for December 23 submittal Attachment 1: Re: Aurora State Airport Master Plan Proposed Preferred Alternative Use of Modifications of Standards Attachment 2: Re: Aurora State Airport Master Plan Proposed Preferred Alternative Septic Drainfield Geotech Report Review: Additional Information
Faegre	Aron	12/26/2024	Email; Attachment	Email: RE: 12.23 FINAL AAIA TLM LTR Preferred alternative Attachment: Site Plan

Farnbach	Rick	11/12/2024	Email	Objection to Proposed Hangar Demolition in Aurora Airport Master Plan
Fellin	Dan	12/18/2024	Email	Public Comment on Aurora Airport Master Plan
Funnell	Adrian	12/19/2024	Email	Aurora Airport Master Plan
Graupp	Bill	11/05/2024	Email	Notice of UAO Master Plan Discussion
Granewich	Bill	09/03/2024	Letter	RE: Comments on July 30, 2024 Aurora Master Plan Alternatives
Hardy	Don	06/13/2024	Email	RE: Aurora Airport project
Helbling	Tony	05/14/2024	Email	RE: Aurora Airport - June 11 PAC meeting and June 13 open house
Helbling	Tony	08/13/2024	Email	PAC Question
Helbling	Tony	08/14/2024	Email	Extension request
Helbling	Tony	08/15/2024	Email; Attachment	Email: Extension Request Attachment: Airport Improvement Program Handbook
Helbling	Tony	09/09/2024	Email; Attachment	Email: Aurora State Airport Attachment: Aron Faegre UAO airport risk analysis for ROFA mod of standards
Helbling	Tony	10/02/2024	Email	Idea for ODAV to work with ODOT
Helbling	Tony	10/17/2024	Email	FW: Master Plan Discussion
Helbling	Tony	10/25/2024	Email	Aurora Preferred Alternative
Helbling	Tony	10/28/2024	Email	Questions
Helbling	Tony	10/29/2024	Email; Attachment	Email: Feedback to Preferred Alternative Rev 0.docx Attachment: RE: Feedback to Preferred Alternative - Aurora Airport Master Plan letter
Helbling	Tony	12/10/2024	Email	PAC
Helbling	Tony	12/10/2024	Email; attachment 1; attachment 2; attachment 3; attachment 4; attachment 5	Email: OAB packet enter into tonight's record Attachment 1: Aurora Airport Situation Brief v5.docx Attachment 2:aurora-amp-preferred-alternative-summary-10.15.24.pdf Attachment 3: ORS 836.642 - Program for through the fence operations.pdf

				Attachment 4: UAO airport risk analysis for ROFA mod of standards - 2024-8-29 Final.pdf Attachment 5: LTR DIRECTOR GARRISON.pdf
Hebling	Tony	12/23/2024	Email 1; Email 2; Attachment 1; Attachment 2; Attachment 3	Email 1: Opposition to taking of drain-field Email 2: Enter into the MP record Attachment 1: Utitlty Easement Attachment 2: Non-commercial Site Lease Attachment 3: Re: Notice to Exercise Lease Renewal
Johnson	Mark	06/14/2024	Email	Aurora State Airport Master Expansion Plan
Keller	Cathy	12/19/2024	Email	KUAO Airport Plan
Kellington	Wendie	08/30/2024	Email	Aurora meeting please
Kellington	Wendie	09/03/2024	Email 1 of 9, Email 2 of 9, Email 3 of 9, Email 4 of 9, Email 5 of 9, Email 6 of 9, Email 7 of 9, Email 8 of 9, Email 9 of 9, Exhibit A, Exhibit B, Exhibit C, Exhibit D, Exhibit E, Exhibit F, Exhibit G, Exhibit H, Exhibit I, Exhibit J, Exhibit L, Exhibit M, Exhibit N	Emails 1 –9: RE: Aurora Airport Master Plan Proceedings
Kellington	Wendie	09/23/2024	Response to 09/03/24 email; attachment 1; attachment 2; attachment 3; attachment 4; attachment 5	
Kellington	Wendie	09/25/2024	Email	RE: Meeting last week
Kellington	Wendie	10/15/2024	Website Comment; Email 1; Email 2	Email 1: Chat and Q & A Email 2: Public records request
Kellington	Wendie	11/03/2024	Email	public comments
Kellington	Wendie	12/10/2024	Email 1; Email 2; Email 3; Email 4; Email 5; Email 6; Email 7; Email 8; Email 9; Email 10; Email 11; Email 12; Email 13; Email 14; Email 15;	Email 1: PAC Member TLM Holdings, LLC's, Response to Oregon Department of Aviation for December 10 PAC Meeting (ODAV) "Preferred Alternative"

			Email 16; Email 17; Email 18; Email 19; Email 20; Email 21; Email 22; Email 23 Exhibit 1; Exhibit 2; exhibit 3; Exhibit 4.1; Exhibit 4.2; Exhibit 4.3; Exhibit 4.4; Exhibit 4.5; Exhibit 4.6; Exhibit 4.7; Exhibit 4.8; Exhibit 4.9; Exhibit 5.1; Exhibit 5.2; Exhibit 5.3; Exhibit 5.4; Exhibit 5.5; Exhibit 6; Exhibit 7; Exhibit 8.1; Exhibit 8.2; Exhibit 9.	Emails 2-23: RE: PAC Member TLM Holdings, LLC's, Response to Oregon Department of Aviation for December 10 PAC Meeting (ODAV) "Preferred Alternative" Exhibit 1: Site Plan Airport Alternative Exhibit 2: ODAV Analysis Exhibit 3: Exception approving HDSE drainfield Exhibit 4.1: 2012 MP_Part1 Exhibit 4.2: 2012 MP_Part2 Exhibit 4.3: 2012 MP_Part3 Exhibit 4.4: 2012 MP_Part4 Exhibit 4.5: 2012 MP_Part5 Exhibit 4.6: 2012 MP_Part6 Exhibit 4.7: 2012 MP_Part7 Exhibit 4.8: 2012 MP_Part8 Exhibit 4.9: 2012 MP_Part9 Exhibit 5.1: 1976 MP_Part1 Exhibit 5.2: 1976 MP_Part2 Exhibit 5.3: 1976 MP_Part3 Exhibit 5.4: 1976 MP_Part4 Exhibit 5.5: 1976 MP_Part5 Exhibit 6: 2012 Approved ALP Exhibit 7: TLM Image showing 2012 approved service road and hangars ODAV wipes out Exhibit 8.1: Taxiway and Runway Access Easement_Part1 Exhibit 8.2: Taxiway and Runway Access Easement_Part2 Exhibit 9: Zone Change/Comprehensive Plan/Conditional Use Case
Kellington	Wendie	12/23/2024	Email; Attachment 1; Attachment 2	Email: 12.23 FINAL AAIA TLM LTR Preferred alternative Attachment 1: Re: December 23, 2024 Comment Letter on Behalf of Aurora Airport Improvement Association and TLM Holdings, LLC, Regarding the Aurora State Airport Master Plan – ODAV Proposed Preferred Alternative Attachment 2: Site Plan
Kincart	Peter	11/25/2024	Email	Aurora Airport master plan
Knowles	David	08/30/2024	Website comment	NA
Krause	Aric	12/18/2024	Email	Concerns Regarding the Proposed Airport Master Plan Alternatives

Laurin	Janette and Harmon	06/10/2024	Email 1; Email 2	Aurora Airport Plan
Lawyer	Matt	12/23/2024	Email; Attachment	Email: Letter for UAO Proposed Preferred Alternative Attachment: Re: Aurora State Airport Master Plan Proposed Preferred Alternative letter
Lewis	Jeff	07/02/2024	Email	UAO Forecast Data
Lewis	Jeff	08/27/2024	Email	KUAO RDC timeline
Linville	Joann	06/10/2024	Email	Re: Aurora Airport - Public event this Thursday (6/13)
MacGregor	Kory	12/20/2024	Email; Attachment.	Email: UAO master plan Attachment: Re: Aurora State Airport Master Plan Proposed Preferred Alternative letter
Mandel	Philip	11/12/2024	Email	Aurora Airport Master Plan
Mauk	David	06/10/2024	Email	Re: Charbonneau Replacement on PAC
Mauk	David	09/17/2024	Letter	Addendum to PAC Feedback Form
Mauk	David	12/16/2024	Website comment	NA
Mayner	Karina	11/18/2024	Email	Aurora Airport Master Plan - Hangars Take
McLaughlin	Hannah	12/22/2024	Email; Attachment	Email: Aurora State Airport Master Plan Comments Attachment: letter
Meskers	Tyler	12/18/2024	Email	Aurora State Airport Master Plan
Meuser	Ken	08/29/2024	Email; Attachment	Email: FW: ODAV master plan alternatives submitted - Objection Attachment: RE: Comments on July 30, 2024 Aurora Master Plan Alternatives
Meuser	Ken	11/12/2024	Email	Aurora Airport Master Plan 2024
Miller	Phillip	12/03/2024	Email	Aurora Airport Master Plan -- Taking of Hangars
Millar	Ted	02/08/2024	Email	RE: Notice - Aurora State Airport Master Plan PAC Meeting
Millar	Ted	08/30/2024	Email	Aurora meeting please
Millar	Ted	09/23/2024	Response to 09/03/24 email; attachment 1; attachment 2; attachment 3; attachment 4; attachment 5	Email: RE: Meeting last week Attachment 1: FW: Scope request - Runway Justification / Constrained Operations Report Attachment 2: Modification of Airport Design Standards Attachment 3: Potential for MOS related to runway extensions at UAO Attachment 4: RE: Investigation Closeout of Vehicle/Pedestrian Deviation Attachment 5: Modification of Airport Design Standards

Millar	Ted	09/25/2024	Email	RE: Meeting last week
Millar	Ted	10/15/2024	Website Comment; Email 1; Email 2	Email 1: Chat and Q & A Email 2: Public records request
Millar	Ted	10/29/2024	Email; Attachment	Email: Feedback to Preferred Alternative Rev 0.docx Attachment: RE: Feedback to Preferred Alternative - Aurora Airport Master Plan letter
Millar	Ted	11/03/2024	Email	public comments
Millar	Ted	12/10/2024	Email 1; Email 2; Email 3; Email 4; Email 5; Email 6; Email 7; Email 8; Email 9; Email 10; Email 11; Email 12; Email 13; Email 14; Email 15; Email 16; Email 17; Email 18; Email 19; Email 20; Email 21; Email 22; Email 23 Exhibit 1; Exhibit 2; exhibit 3; Exhibit 4.1; Exhibit 4.2; Exhibit 4.3; Exhibit 4.4; Exhibit 4.5; Exhibit 4.6; Exhibit 4.7; Exhibit 4.8; Exhibit 4.9; Exhibit 5.1; Exhibit 5.2; Exhibit 5.3; Exhibit 5.4; Exhibit 5.5; Exhibit 6; Exhibit 7; Exhibit 8.1; Exhibit 8.2; Exhibit 9.	Email 1: PAC Member TLM Holdings, LLC's, Response to Oregon Department of Aviation for December 10 PAC Meeting (ODAV) "Preferred Alternative" Emails 2-23:: RE: PAC Member TLM Holdings, LLC's, Response to Oregon Department of Aviation for December 10 PAC Meeting (ODAV) "Preferred Alternative" Exhibit 1: Site Plan Airport Alternative Exhibit 2: ODAV Analysis Exhibit 3: Exception approving HDSE drainfield Exhibit 4.1: 2012 MP_Part1 Exhibit 4.2: 2012 MP_Part2 Exhibit 4.3: 2012 MP_Part3 Exhibit 4.4: 2012 MP_Part4 Exhibit 4.5: 2012 MP_Part5 Exhibit 4.6: 2012 MP_Part6 Exhibit 4.7: 2012 MP_Part7 Exhibit 4.8: 2012 MP_Part8 Exhibit 4.9: 2012 MP_Part9 Exhibit 5.1: 1976 MP_Part1 Exhibit 5.2: 1976 MP_Part2 Exhibit 5.3: 1976 MP_Part3 Exhibit 5.4: 1976 MP_Part4 Exhibit 5.5: 1976 MP_Part5 Exhibit 6: 2012 Approved ALP Exhibit 7: TLM Image showing 2012 approved service road and hangars ODAV wipes out Exhibit 8.1: Taxiway and Runway Access Easement_Part1 Exhibit 8.2: Taxiway and Runway Access Easement_Part2

				Exhibit 9: Zone Change/Comprehensive Plan/Conditional Use Case
Millar	Ted	12/23/2024	Email; Attachment 1; Attachment 2	Email: 12.23 FINAL AAIA TLM LTR Preferred alternative Attachment 1: Re: December 23, 2024 Comment Letter on Behalf of Aurora Airport Improvement Association and TLM Holdings, LLC, Regarding the Aurora State Airport Master Plan – ODAV Proposed Preferred Alternative Attachment 2: Site Plan
Moon	Jan	11/10/2024	Email	Regarding the Aurora Airport Master Plan that is Currently Underway
Moss	Janet	06/15/2024	Email	Aurora State Airport Master Plan
Nager	Andy	12/21/2024	Email	Aurora Airport Master Plan
Newbury	Kirsten	06/11/2024	Website comment	NA
Newbury	Kirsten	09/03/2024	Website comment	NA
Newbury	Kristen	12/13/2024	Website comment	NA
Nickerson	Lukas	12/23/2024	Email; Attachment	Email: Pacific Skies Aviation Letter Regarding the Proposed Aurora State Master Plan Attachment: Re: Aurora State Airport Master Plan Proposed Preferred Alternative letter
No Name		06/23/2024	Website comment	NA
North	James	11/29/2024	Email	Aurora Aviation Master Plan - Hangar Removal Objection
O'Malley	Kevin	12/23/2024	Email; Attachment	Email: Aurora State Airport Master Plan Proposed Preferred Alternative Attachment: Aurora State Airport Master Plan Proposed Preferred Alternative letter
Oerding	Jeff	11/24/2024	Email	comments, Aurora Airport Master Plan - East Side Property Acquisition strategy
Ottenad	Mark	01/25/2024	Email	agenda
Ottenad	Mark	05/23/2024	Email	RE: Wed 5/29 Aurora-Wilsonville-ODAV meeting
Ottenad	Mark	12/04/2024	Email	RE: Aurora Airport - PAC meeting next Tuesday
Patterson	Allen	12/19/2024	Email	UAO Hangar Destruction!
Peters	Elizabeth	09/23/2024	Website Comment	NA
Pilon	Denis	12/09/2024	Email	Meeting December 10, 2024
Porter	Bruce	12/18/2024	Email	Aurora Airport plan
Poss	Jason	10/03/2024	Website Comment	NA
Pricher	Jeffrey	10/31/2024	email	Fw: Potential for MOS related to runway extensions at UAO

Puls	Sarah	03/21/2024	Email	RE: Aurora Airport PAC meeting scheduled for Tuesday, April 30, 2024
Reid	Marci	12/22/2024	Email	Aurora Master Plan
Reuven	Itamer	12/17/2024	Email	NO to KUAO Airport Hangers Destruction
Rhodes	Mike	12/22/2024	Email	UAO Master plan
Rissel	Phillip	12/18/2024	Email	KUAO
Robertson	Matthew	12/22/2024	Email	KUAO masterplan comments
Roche	Kristin	06/12/2024	Website comment	NA
Schreiber	Jeff	08/29/2024	Email; Attachment	Email: Response to ODAV Master Plan Alternatives issued July 30, 2024 Attachment: RE: Comments on July 30, 2024 Aurora Master Plan Alternatives letter
Schreiber	Jeff	12/23/2024	Email	Urgent input and Opposition to proposed Aurora Airport Master Plan
Schreiber	Wendy	11/08/2024	Email	Master Plan for Aurora State Airport
Shevlin	Anne	05/28/2024	Email	Charbonneau Replacement on PAC
Stack	Peter	11/08/2024	Email	Regarding the Aurora Airport Master Plan Process
Stickel	Jamie	10/11/2024	Email	RE: Aurora PAC membership
Stickel	Jamie	12/23/2024	Email; Attachment	Email: Aurora State Airport Master Plan Proposed Preferred Alternative Attachment: Re: Aurora State Airport Master Plan Proposed Preferred Alternative Letter
Storey	John	07/11/2024	Website comment	NA
Storey	John	11/08/2024	Email	Objectction to current Aurora Airport master plan
Swan	Stan	11/17/2024	Email	Aurora State Airport Master Plan
Swan	Walter	11/08/2024	Email	Aurora Airport Master Plan
Swan	Walter	12/18/2024	Email	Aurora Airport Master Plan
Thomas to Johnson	Alex/Betsy	12/17/2024	Email; Attachment	Email: UAO Master Plan PAC & Meeting Attachment: PAC Protocols
Tipper	Mark	07/01/2024	Email	KUAO Master Plan Input
Tipperreiter	Mark	07/01/2024	Website comment	NA
Tipperreiter	Mark	11/06/2024	Email	Update Re: KUAO 8/21/24 Master Plan Input
Turel	Gary	12/02/2024	Email	The Aurora Airport master plan
VanBeek	Don	11/14/2024	Email	Regarding the Aurora Airport master plan that is currently underway

Van Hoomissen	George	08/01/2024	Letter	Comments to Oregon Department of Aviation
Van Hoomissen	George	08/16/2024	Website comment	NA
Van Hoomissen	George	08/27/2024	Email	RE: Aurora State Airport Master Plan Website Comments - George Van Hoomissen
Van Hoomissen	George	09/08/2024	Email; Attachment	Email: Correspondence for ODAV Board Members Attachment: Comments to Oregon Department of Aviation
Van Hoomissen	George	10/15/2024	Website Comment 1; Website Comment 2; Website Comment 3	NA
Van Hoomissen	George	12/10/2024	Website comment; Email	NA Email: RE: Aurora State Airport Master Plan Website Comments - George Van Hoomissen
Waggoner	David	04/29/2024	Website comment	NA
Waggoner	David	06/21/2024	Email	Hot Spot mitigation
Waggoner	David	08/11/2024	Email	An option to relocation the Hubbard Hy
Waggoner	David	10/14/2024	Email	Re: Aurora Airport - PAC meeting #7 tomorrow
Waggoner	David	12/10/2024	Email	PAC
Walsh	Mike	06/13/2024	Email	Aurora Airport Master Plan
Weimer	Mike	10/09/2024	Email	Re: Aurora PAC membership
Williams	Ben	03/12/2024	Email; Letter	Email: Comments submitted during PAC meeting Letter: Re Comments on FAA Forecast Approval letter and Chapter 3 Airport Activities Forecast
Williams	Ben	04/29/2024	Email	FW: Webinar host invited you to be panelist for Aurora Airport Master Plan - PAC meeting #5
Williams	Ben	09/12/2024	Letter	Letter to Chair Stephens & Aviation Board re: Aurora Airport Master Plan
Williams	Ben	10/04/2024	Email	Re: Aurora Airport - PAC meeting #7 (10/15/24) reminder
Williams	Ben	10/08/2024	Email	Aurora Airport Master Plan Preferred Alternative
Williams	Ben	12/06/2024	Email; Attachment	Email: Comments in advance of Aurora Airport PAC Meeting 8 Roundtable Discussion Attachment: Comments from Friends of French Prairie for Aurora Airport PAC Meeting 8 Roundtable discussion on Preferred Alternative
Williams	Josh	08/28/2024	Email	Aurora Airport master plan
Willis	Patrick	12/22/2024	Email	Aurora Airport Master Plan

Willis	Norm	12/18/2024	Email	Aurora Airport plans
Winston	Eric	11/24/2024	Website comment	NA
Wright	Trent	12/23/2024	Email; Attachment	Email: Aurora State Airport Comment Letter - Umpqua Bank Attachment: Strong Opposition to the "Preferred Alternative" in the Aurora State Airport Master Plan Letter

Outlook

Re: Aurora State Airport Master Plan Website Comments - Robert Altemus

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From Jen Winslow <Jen.winslow@jla.us.com>
Date Thu 1/2/2025 4:52 PM
To alto53@comcast.net <alto53@comcast.net>
Cc Brandy Steffen <brandy.steffen@jla.us.com>; Ashley Balsom <ashley.balsom@jla.us.com>

Hi Bob,

Thank you for your comment, and I hope you had a nice holiday! I have forwarded to the Master Plan Team.

Thanks,

JEN WINSLOW | **JLA PUBLIC INVOLVEMENT**
Program Manager
She/Her » Why pronouns matter
jen.winslow@jla.us.com » Cell 503-367-6447 » Office 503-235-5881 » jla.us.com

Work hours 9 a.m.–5 p.m. Monday–Friday

From: Robert Altemus <noreply@jotform.com>
Sent: Friday, December 20, 2024 8:12 AM
To: JLA Tech Support <tech@jla.us.com>; Jen Winslow <Jen.winslow@jla.us.com>; Ashley Balsom <ashley.balsom@jla.us.com>; Brandy Steffen <brandy.steffen@jla.us.com>
Subject: Re: Aurora State Airport Master Plan Website Comments - Robert Altemus

Aurora State Airport Master Plan Website Comments

Name	Robert Altemus
Organization	Retired, GA pilot flying out of Mulino
Comments or questions?	I certainly understand the Hubbard Rd realignment to ensure meeting the RSA requirements. However I'm unsure of the requirement/reasoning to propose a 35' wide Taxilane, and a vehicle service road, to be built parallel to the existing full length Taxiway Alpha, especially considering the significant necessary acquisition and removal of existing facilities. Admittedly, I've got some catching up to do regarding this latest iteration to the Aurora Master Plan Project, but so far I haven't seen

	the history or operational data leading to this proposal. Thanks for any consideration to my query, respectfully, Bob Altemus I would like to receive email updates.
If you would like a response, please tell us the best way to contact you:	Email
Email	alto53@comcast.net

You can edit this submission and view all your submissions easily.

Outlook

Fw: Opposition to expansion of Aurora State Airport

From Brandy Steffen <brandy.steffen@jla.us.com>
Date Mon 6/17/2024 12:32 PM
To Jen Winslow <Jen.winslow@jla.us.com>

comment

BRANDY STEFFEN | JLA PUBLIC INVOLVEMENT
brandy.steffen@jla.us.com » 503-235-5881 » jla.us.com
Woman-led, community-centered, for 35 years and counting
Meeting + email hours 9 a.m.–5 p.m. Tuesday–Friday. Administrative-only hours on Monday.
Check my availability » Schedule a 30 minute check-in

From: BEACH Anthony <Anthony.BEACH@odav.oregon.gov>
Sent: Monday, June 17, 2024 8:24 AM
To: Brandy Steffen <brandy.steffen@jla.us.com>; Samantha Peterson <SPeterson@CenturyWest.com>
Cc: THOMAS Alex R <Alex.R.THOMAS@odav.oregon.gov>
Subject: FW: Opposition to expansion of Aurora State Airport

From: Oregon Department of Aviation <mail.aviation@ODAV.oregon.gov>
Sent: Monday, June 17, 2024 8:18 AM
To: BEACH Anthony <Anthony.BEACH@odav.oregon.gov>; THOMAS Alex R <Alex.R.THOMAS@odav.oregon.gov>
Subject: FW: Opposition to expansion of Aurora State Airport

From: John Andrews <andrews.john2000@gmail.com>
Sent: Sunday, June 16, 2024 8:46 AM
To: Oregon Department of Aviation <mail.aviation@ODAV.oregon.gov>; Warren.Ferrell@faa.gov; Timothy.A.House@faa.gov; THOMAS Alex R <Alex.R.THOMAS@odav.oregon.gov>; Ann.McColaugh@oregon.gov; Kelly.S.Brooks@orgon.gov; David Miller <dmiller@centurywest.com>
Cc: John Andrews <andrews.john2000@gmail.com>; Jean L Gaumer <gaumjlily@gmail.com>; fitzgerald@ci.wilsonville.or.us
Subject: Opposition to expansion of Aurora State Airport

Some people who received this message don't often get email from andrews.john2000@gmail.com. Learn why this is important

This message was sent from outside the organization. Treat attachments, links and requests with caution. Be conscious of the information you share if you respond.

My wife and I are residents of Charbonneau (Wilsonville). We wish to register our strong opposition to any proposed airport expansion. Expansion of the airport, especially the lengthening of the runway, will encourage increased air traffic and enable and encourage larger jets that will further increase overflight noise. The increased air traffic will also lead to increased local road traffic in the vicinity of the airport and on I-5.

The city of Wilsonville has registered opposition to the airport expansion and listed many reasons that the expansion is ill advised and unnecessary. We join with the City in opposition to airport expansion.

Another factor in our opposition to airport expansion is that other property owners in the vicinity of the airport will seek exceptions to the land use restrictions outside the urban development zone. Langdon Farms has already sought an exception to the land use regulations to build a truck depot. If the airport were to be expanded, that would provide more justification for Langdon Farms and other property owners to convert from recreational use and farmland to industrial uses in support of the expanded airport.

We have lived in Charbonneau for twelve years and have enjoyed the relative quiet of the area and lived with the current level of noise from jet overflights. Increase in the level of aircraft noise and road traffic through expansion of the airport would degrade the area irreparably. Please do not expand the airport and especially do not lengthen the runway to enable larger jets to land and take off from the Aurora State Airport.

I was disappointed that I was unable to speak to a senior member of the Oregon Department of Aviation at the June 13 meeting.

Best regards,
John Andrews and Jean Gaumer
[redacted]
Wilsonville,. OR 97070
Phone: [redacted]
Email: andrews.john2000@gmail.com

Outlook

Re: Aurora State Airport Master Plan Website Comments - CHELSEA AUSLAND

From CHELSEA AUSLAND <noreply@jotform.com>
Date Wed 6/12/2024 1:53 PM
To JLA Tech Support <tech@jla.us.com>; Jen Winslow <Jen.winslow@jla.us.com>

Aurora State Airport Master Plan Website Comments

Name	CHELSEA AUSLAND
Organization	Metro West Realty
Comments or questions?	I am opposed to the expansion of the Aurora Airport. As a resident in Wilsonville, OR, I already see far too many large and small planes above my house. The noise is awful and scares the wildlife. The small is also terrible and has notably affected our health. I would like to receive email updates.
If you would like a response, please tell us the best way to contact you:	Email
Email	causland@gmail.com
Phone Number	(503) 548-7973

You can edit this submission and view all your submissions easily.

Outlook

Fw: Aurora Airport master plan

From Brandy Steffen <brandy.steffen@jla.us.com>
Date Fri 2024-11-01 3:00 PM
To Jen Winslow <Jen.winslow@jla.us.com>; Ashley Balsom <ashley.balsom@jla.us.com>

BRANDY STEFFEN | **JLA PUBLIC INVOLVEMENT**
Partner + Senior Program Manager
brandy.steffen@jla.us.com » Schedule a 30 minute meeting

From: BEACH Anthony <Anthony.BEACH@odav.oregon.gov>
Sent: Friday, November 1, 2024 2:25 PM
To: Samantha Peterson <SPeterson@CenturyWest.com>; Brandy Steffen <brandy.steffen@jla.us.com>
Cc: THOMAS Alex R <Alex.R.THOMAS@odav.oregon.gov>
Subject: FW: Aurora Airport master plan

Good afternoon,

Please include in the public record.

Tony Beach
OREGON DEPARTMENT OF AVIATION
STATE AIRPORTS MANAGER
OFFICE 503-378-2523 **CELL** 503-302-5455
M-F 7:30am – 4pm

From: BEACH Anthony
Sent: Friday, November 1, 2024 2:24 PM
To: 'David Bakke - Energy Systems N.W.' <dbakke@energysystemsnw.com>; THOMAS Alex R <Alex.R.THOMAS@odav.oregon.gov>
Cc: Bruce@AuroraAviation.com
Subject: RE: Aurora Airport master plan

Hi David, thank you for your comment. I have forwarded it to the master plan team to be included in the record.

Tony Beach
OREGON DEPARTMENT OF AVIATION
STATE AIRPORTS MANAGER
OFFICE 503-378-2523 **CELL** 503-302-5455
M-F 7:30am – 4pm

From: David Bakke - Energy Systems N.W. <dbakke@energysystemsnw.com>
Sent: Friday, November 1, 2024 12:39 PM
To: THOMAS Alex R <Alex.R.THOMAS@odav.oregon.gov>; BEACH Anthony <Anthony.BEACH@odav.oregon.gov>
Cc: Bruce@AuroraAviation.com
Subject: Aurora Airport master plan

Some people who received this message don't often get email from dbakke@energysystemsnw.com. Learn why this is important

This message was sent from outside the organization. Treat attachments, links and requests with caution. Be conscious of the information you share if you respond.

This is in regard to the Aurora Airport master plan.

Due to the proposed changes I hereby request that you register and make part of the master plan record my objection and concerns to "taking" of, or destruction to any privately owned hangars on the Aurora Airport. I recommend and support airport safety improvements but only with no affect to any of the hangars.

Thank you,
David Bakke
dbakke@energysystemsnw.com

11/1/24

Outlook

Re: ODA PAC Membership Roster

From Brandy Steffen <brandy.steffen@jla.us.com>
Date Tue 2/13/2024 11:04 AM
To THOMAS Alex R <Alex.R.THOMAS@odav.oregon.gov>
Cc Jen Winslow <Jen.winslow@jla.us.com>

Wonderful! Thanks Alex; we'll add them to the PAC email list.

BRANDY STEFFEN | **JLA PUBLIC INVOLVEMENT**
Strategist + Partner
She/Her » Why pronouns matter
brandy.steffen@jla.us.com » 503-235-5881 » jla.us.com
Woman-led, community-centered, for 35 years and counting

Meeting + email hours 9 a.m.–5 p.m. Monday–Thursday. Administrative-only hours on Friday

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From: THOMAS Alex R <Alex.R.THOMAS@odav.oregon.gov>
Sent: Monday, February 12, 2024 6:03 PM
To: Brandy Steffen <brandy.steffen@jla.us.com>
Subject: FW: ODA PAC Membership Roster

Hello Brandy,

Good evening, please see below for the Confederated Tribes of Siletz Indians.

ALEX THOMAS
OREGON DEPARTMENT OF AVIATION
PLANNING & PROGRAMS MANAGER

CELL 971-375-2357

EMAIL Alex.R.Thomas@ODAV.Oregon.Gov

3040 25TH STREET SE, SALEM, OR 97302

WWW.OREGON.GOV/AVIATION

*****CONFIDENTIALITY NOTICE*****

This e-mail may contain information that is privileged, confidential, or otherwise exempt from disclosure under applicable law. If you are not the addressee or it appears from the context or otherwise that you have received this e-mail in error, please advise me immediately by reply e-mail, keep the contents confidential, and immediately delete the message and any attachments from your system.

From: Pamela Barlow-Lind <pamelal@ctsi.nsn.us>
Date: Monday, February 12, 2024 at 17:26
To: THOMAS Alex R <Alex.R.THOMAS@odav.oregon.gov>
Subject: ODA PAC Membership Roster

You don't often get email from pamelal@ctsi.nsn.us. Learn why this is important

This message was sent from outside the organization. Treat attachments, links and requests with caution. Be conscious of the information you share if you respond.

Re: "We are reaching out to confirm and/or update the current membership roster of this PAC. The Confederated Tribes of Siletz Indians currently has a vacant seat on our roster. Please confirm which individual will represent your organization. Please provide the name, e-mail, and phone number for contact information."

I can act as the Confederated Tribes of Siletz Indians representative if you like.
This has been approved by the Assistant to the CEO.
I have a background in Planning and Transportation, including GA airport management.

Pam Barlow Lind
Planning Director
CTSI
(541) 444-8361
PO Box 549
Siletz OR 97380

Outlook

Re: Anti-terrorism Measures

From Brandy Steffen <brandy.steffen@jla.us.com>
Date Tue 3/19/2024 11:04 AM
To jeff.baymor@gmail.com <jeff.baymor@gmail.com>

Thank you for your comment, Jeff.

I will make sure that this is sent to the project's technical team for consideration. Please reach out if you have any other comments or questions. You can also learn more about the project at: https://publicproject.net/AuroraAirport#

Thanks,
Brandy

BRANDY STEFFEN | **JLA PUBLIC INVOLVEMENT**
Strategist + Partner
She/Her » Why pronouns matter
brandy.steffen@jla.us.com » 503-235-5881 » jla.us.com
Woman-led, community-centered, for 35 years and counting

From: Jeff Baymor <jeff.baymor@gmail.com>
Sent: Tuesday, March 12, 2024 4:58 PM
Subject: Anti-terrorism Measures

What if any anti-terrorism measures have been taken at the Aurora Airport. The airport is located less than 25 miles from Portland Downtown Towers and Salem.

Jeff Baymor
(520) 349-7686

Outlook

Re: Aurora State Airport Master Plan Website Comments - Jeffrey Baymor

From Jeffrey Baymor <noreply@jotform.com>
Date Fri 2024-08-16 12:45 PM
To JLA Tech Support <tech@jla.us.com>; Jen Winslow <Jen.winslow@jla.us.com>; Ashley Balsom <ashley.balsom@jla.us.com>; Brandy Steffen <brandy.steffen@jla.us.com>

Aurora State Airport Master Plan Website Comments

Name	Jeffrey Baymor
Organization	Wilsonville Resident
Comments or questions?	There appears to be a security risk associated with the Aurora Airport. On multiple occasions VPDs, Vehicle, Pedestrian, Deviations have taken place. Unauthorized people have entered the airport, entered hangars, driven on the runway, walked their dog within restricted areas..... There is no standard security system or set of regulations that cover all operators at Aurora Airport. Given the airport's proximity to Portland city center and the State Capital complex, it is essential that better security be maintained at Aurora Airport. The opportunity for a terrorist attack developing due to lack of security at Aurora Airport is much too great. I would like to receive email updates.
If you would like a response, please tell us the best way to contact you:	Email
Email	jeffbaymor@hotmail.com

You can edit this submission and view all your submissions easily.

Outlook

Re: Aurora State Airport Master Plan Website Comments - Bruce Bennett

From Bruce Bennett <noreply@jotform.com>
Date Tue 4/30/2024 6:52 PM
To JLA Tech Support <tech@jla.us.com>; Jen Winslow <Jen.winslow@jla.us.com>

Aurora State Airport Master Plan Website Comments

Name	Bruce Bennett
Organization	Aurora Aircraft LLC
Comments or questions?	Thank you for the professional planning job! Please include an internal circulation road and consider ODAV purchasing approximately one acre of ramp space NE of taxiway A3 to allow a huge relief in taxiway congestion as well as significant improvement in ramp to taxiway flow. Also please consider the FAA requirement to land in 60% of the available runway and to always have a "balanced field". Again thank you and please contact me with any questions.

You can edit this submission and view all your submissions easily.

Outlook

Re: Aurora State Airport Master Plan Website Comments - Bruce Bennett

From Bruce Bennett <noreply@jotform.com>
Date Tue 5/14/2024 4:35 AM
To JLA Tech Support <tech@jla.us.com>; Jen Winslow <Jen.winslow@jla.us.com>

Aurora State Airport Master Plan Website Comments

Name	Bruce Bennett
Organization	Aurora Aircraft LLC
Comments or questions?	I believe an internal circulation road created on private airport property connected to State airport property should be made a priority at KUAO for operational and safety purposes. Also, that ODAV should expeditiously pursue purchasing the ramp property NE of taxiway A3 and connecting to the midfield State ramp for immediate and significant improvements in operational flow and airport safety. I would like to receive email updates.
If you would like a response, please tell us the best way to contact you:	Email
Email	Bruce@AuroraAviation.com
Phone Number	[redacted]

You can edit this submission and view all your submissions easily.

Outlook

Re: lot line

From Brandy Steffen <brandy.steffen@jla.us.com>
Date Tue 6/11/2024 5:22 PM
To Bruce Bennett <bruce@auroraaviation.com>
Cc Jen Winslow <Jen.winslow@jla.us.com>

Thanks Bruce. We'll make sure that this is included in the summary.

Thanks,
Brandy

BRANDY STEFFEN | **JLA PUBLIC INVOLVEMENT**
brandy.steffen@jla.us.com » 503-235-5881 » jla.us.com
Woman-led, community-centered, for 35 years and counting
Meeting + email hours 9 a.m.–5 p.m. Tuesday–Friday. Administrative-only hours on Monday.
Check my availability » Schedule a 30 minute check-in

From: Bruce Bennett <bruce@auroraaviation.com>
Sent: Tuesday, June 11, 2024 5:11 PM
To: Brandy Steffen <brandy.steffen@jla.us.com>
Subject: Fwd: lot line

Below & attached are follow ups for the plan input sent last month
Please contact me with any questions
Thank you

Bruce Bennett
Aurora Aircraft llc
Mbl 503-709-7383

Sent from my iPhone

Begin forwarded message:

> **From:** Bruce Bennett <bruce@auroraaviation.com>
> **Date:** June 11, 2024 at 11:30:49 AM PDT
> **To:** alex.r.thomas@odav.oregon.gov, Tony Beach <Anthony.BEACH@aviation.state.or.us>, SUGAHARA Kenji <Kenji.SUGAHARA@odav.oregon.gov>
> **Subject: Fwd: lot line**
>
> Alex,

Attached is an outline of the property parcel that I showed to Tony & Kenji and that is available to ODAV.
As we discussed this Aurora ramp space would facilitate a huge improvement in Aircraft and vehicle movement at UAO.
This property transfer would go along with ODAV's 1995 plans to own & control ramp space as well as the FAA's 1985 directive for ODAV to increase their UAO ownership percentage
Please add this to the master plan record and contact me with any questions.
Thank you

Bruce Bennett
Aurora Aircraft llc
Mbl 503-709-7383

Sent from my iPhone

Begin forwarded message:

> **From:** Bruce Bennett <bruce@auroraaviation.com>
> **Date:** June 10, 2024 at 10:17:30 PM PDT
> **To:** Jim Gingo <jgingo52@gmail.com>
> **Subject: Fwd: lot line**
>
> Jim,
>
> Attached is the drawing you requested. I believe it is accurate except for the concrete pad in front of Schreiber's hangar.
> I did not mean to surprise you with this and am optimistic we can work something out that is beneficial to all.
> Thank you
>
> Bruce Bennett
> Aurora Aircraft llc
> Mbl 503-709-7383
>
> Sent from my iPhone
>
> Begin forwarded message:
>
> > **From:** Leann Bennett <leannrbennett@gmail.com>
> > **Date:** June 10, 2024 at 9:08:49 PM PDT
> > **To:** Bruce Bennett <bruce@auroraaviation.com>
> > **Subject: lot line**
> >
> > Leann Bennett, Principal Broker
> > Metro-West Realty
> > LeannRBennett@gmail.com
> > 503-504-6772 Cell
> > 503-692-3050 Office


METROWEST
REALTY

RMLS*web* Map

MLS#: 17690366
Price: $475,000
Address: 14302 STENBOCK WAY, Aurora, 97002



Records found: 1 Zoom x19

Photo	MLS#/Tax#	address	status	Cat.	area	price	Beds	Baths
status: SLD								
	17690366	14302 STENBOCK WAY , Aurora , OR 97002	SLD	COM	170	$475,000		

1

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Outlook

Re: Aurora State Airport Master Plan Website Comments - Bruce Bennett

From Bruce Bennett <noreply@jotform.com>
Date Mon 6/17/2024 6:54 PM
To JLA Tech Support <tech@jla.us.com>; Jen Winslow <Jen.winslow@jla.us.com>

Aurora State Airport Master Plan Website Comments

Name	Bruce Bennett
Organization	Blue Sky Aurora LLC
Comments or questions?	I request that the one-acre ramp parcel that I own abutting the SW corner of ODAV's landside parcel be considered as potential additional ODAV ramp for short term Aircraft parking and as a taxi lane to allow aircraft and vehicle access to the ODAV parcel from taxiway A. This small parcel could open up access for the tower, Pacific Coast Avionics, the CAA, and the entire ODAV ramp.
If you would like a response, please tell us the best way to contact you:	Email
Email	Bruce@AuroraAviation.com
Phone Number	[redacted]

You can edit this submission and view all your submissions easily.

Outlook

Re: Aurora State Airport Master Plan Website Comments - Bruce Bennett

From Bruce Bennett <noreply@jotform.com>
Date Mon 6/17/2024 7:06 PM
To JLA Tech Support <tech@jla.us.com>; Jen Winslow <Jen.winslow@jla.us.com>

Aurora State Airport Master Plan Website Comments

Name	Bruce Bennett
Organization	A
Comments or questions?	As a PAC member, i strongly discourage any plan to move the runway due to the existing ramp constraints with a "one sided" (due to hwy 551) Airport and due to the giant cost, complexity, destruction of existing businesses, and unknowable time schedule. Thank you.
If you would like a response, please tell us the best way to contact you:	Email
Email	Bruce@AuroraAviation.com
Phone Number	([redacted]

You can edit this submission and view all your submissions easily.

Outlook

Fw: Aurora Airport Master Plan

From Brandy Steffen <brandy.steffen@jla.us.com>
Date Fri 2024-11-01 4:49 PM
To Jen Winslow <Jen.winslow@jla.us.com>; Ashley Balsom <ashley.balsom@jla.us.com>

BRANDY STEFFEN | **JLA PUBLIC INVOLVEMENT**
Partner + Senior Program Manager
brandy.steffen@jla.us.com » Schedule a 30 minute meeting

From: BEACH Anthony <Anthony.BEACH@odav.oregon.gov>
Sent: Wednesday, October 30, 2024 4:15 PM
To: Brandy Steffen <brandy.steffen@jla.us.com>; Samantha Peterson <SPeterson@CenturyWest.com>
Cc: THOMAS Alex R <Alex.R.THOMAS@odav.oregon.gov>
Subject: FW: Aurora Airport Master Plan

FYI, please include this in the record, and prepare responses for the PAC summary.

Thank you,

Tony Beach
OREGON DEPARTMENT OF AVIATION
STATE AIRPORTS MANAGER
OFFICE 503-378-2523 **CELL** 503-302-5455
M-F 7:30am – 4pm

From: Bruce Bennett <bruce@auroraaviation.com>
Sent: Tuesday, October 29, 2024 4:00 PM
To: BEACH Anthony <Anthony.BEACH@odav.oregon.gov>; THOMAS Alex R <Alex.R.THOMAS@odav.oregon.gov>; Brandy Steffen <brandy.steffen@jla.us.com>
Subject: Aurora Airport Master Plan

This message was sent from outside the organization. Treat attachments, links and requests with caution. Be conscious of the information you share if you respond.

Thank you all for the work on this project. I believe you've made significant propgress and that there is only one more change required but that this change is extremely significant. My PAC member input follows including some points for reference;

- Since its construction in 1943, the Aurora Airport has been a public airport with most of the adjoining properties being privately owned, this has worked very well with private investment of over $220 million in aviation businesses currently at the airport.

- Because of this public/private arrangement the local government collects over $1.8 million per year from these adjoining airport-use properties in property taxes for the local community, the business on these properties also pay ODAV runway usage fees as well as fuel taxes.

- This arrangement known is by the FAA as "though the fence" and is codified/supported in Oregon law by ORS 836.64

- There are a wide range of aviation businesses on this private property at the Aurora airport, many specializing in saving lives and fighting forest fires, as well as disaster relief, flight training for career development, law enforcement, military support, including aircraft manufacturing and many more support business providing approximately 1500 very good jobs.
  - This version of the plan includes adding a vehicle movement lane right next to the aircraft taxiway and adding a second parrell taxiway, because of these additions the plan calls for nine (one of which is in the early stages of construction) of the biggest and newest hangars to be condemned and destroyed. The owners of these hangars and the entire airport community believe this is completely unnecessary and in the case of the vehicle lane, actually significantly decreases safety. I also know that any conedemation efforts would be met with much legal action, which would be very counter-productive and I believe complely unneccesary.
  - As a compromise solution I have offered to sell at a significant discount a one-acre lot that was created specifically for the use of ODAV to assist in much of the needs for which the new vehicle lane and taxiway are envisioned

  - Our main concern past the safety compromise of the misplaced vehicle lane is not just the tens or hundreds of millions of dollars unnecessarily wasted by this plan proposal* but by the very real possibility that this would cause most of the major employers to leave the Airport and the state. And that this could happen even if no physical changes are made but as soon as this plan is made official.
  *we believe the value of the nine hangars cited for destruction will drop significantly and immediately and that the cost of demolition and replacement would be enormous.

Again, thank you for the work done and for your openess to input. I look forward to going over this with the planning group.

Bruce Erik Bennett
Aurora Aircraft LLC
Aurora Oregon KUAO Airport Since 1968
503-709-7383

Outlook

Fw: PAC input Aurora Master Plan

From Brandy Steffen <brandy.steffen@jla.us.com>
Date Mon 2025-01-06 8:52 AM
To Ashley Balsom <ashley.balsom@jla.us.com>; Jen Winslow <Jen.winslow@jla.us.com>

BRANDY STEFFEN | **JLA PUBLIC INVOLVEMENT**
Senior Program Manager + Partner
She/Her » Why pronouns matter
brandy.steffen@jla.us.com » Office 503-235-5881 » jla.us.com
Meeting + email hours 9 a.m.–5 p.m. Monday–Thursday » Administrative-only hours Friday
Check my availability » Schedule a 30 minute check-in

JLA Public Involvement's mission: To create collaborative, meaningful and exceptionally effective public processes that lead to better, more inclusive outcomes.

Please note: I will be on vacation, without access to my email, starting Friday, 01/24/25 and returning Monday, 02/03/25.

From: BEACH Anthony <Anthony.BEACH@odav.oregon.gov>
Sent: Monday, December 23, 2024 2:54 PM
To: Brandy Steffen <brandy.steffen@jla.us.com>; Samantha Peterson <SPeterson@CenturyWest.com>
Cc: THOMAS Alex R <Alex.R.THOMAS@odav.oregon.gov>
Subject: FW: PAC input Aurora Master Plan

Good afternoon, please include this email in the public record.

Thank you,

Tony Beach
OREGON DEPARTMENT OF AVIATION
STATE AIRPORTS MANAGER
OFFICE 503-378-2523 **CELL** 503-302-5455
M-F 7:30am – 4pm

From: BEACH Anthony
Sent: Monday, December 23, 2024 2:54 PM
To: Bruce Bennett <bruce@auroraaviation.com>; THOMAS Alex R <Alex.R.THOMAS@odav.oregon.gov>
Cc: SUGAHARA Kenji <Kenji.SUGAHARA@odav.oregon.gov>; Brandy Steffen <brandy.steffen@jla.us.com>
Subject: RE: PAC input Aurora Master Plan

Hi Bruce, thank you for your comments, this will be included in the record for the UAO master plan.

Thank you,

Tony Beach
OREGON DEPARTMENT OF AVIATION
STATE AIRPORTS MANAGER
OFFICE 503-378-2523 **CELL** 503-302-5455
M-F 7:30am – 4pm

From: Bruce Bennett <bruce@auroraaviation.com>
Sent: Monday, December 23, 2024 2:07 PM
To: THOMAS Alex R <Alex.R.THOMAS@odav.oregon.gov>; BEACH Anthony <Anthony.BEACH@odav.oregon.gov>
Cc: SUGAHARA Kenji <Kenji.SUGAHARA@odav.oregon.gov>; Brandy Steffen <brandy.steffen@jla.us.com>
Subject: PAC input Aurora Master Plan

This message was sent from outside the organization. Treat attachments, links and requests with caution. Be conscious of the information you share if you respond.

Dear ODAV,

Please accept this this message as my PAC member input on the current Aurora master plan. First, I want to thank you for the great job "herding the cats" by getting input from users and affected individuals as well as organizing this project.

My strongest advice is to remove any consideration of condemning and destroying hangars, I believe these hangars are the lifeblood of the Aurora Airport and are necessary to the lives saved, forest fires fought, and many good careers created by the owner/tenants of these hangars. The method to protect those hangars is to eliminate the parallel taxiway and vehicle lane plans, neither of which are absolutely necessary and both of which can be accomplished to a degree by ODAV's purchase of the mid-field property south of the control tower that has been offered to ODAV on the 16th of this Month.

This one change will eliminate a huge amount of money being wasted, will improve safety by separating aircraft and vehicles and will protect hundreds of excellent Aviation jobs as well as protecting the 100% Aviation use of this property.

The second most important recommendation I make is to please closely consider and utilize the excellent information provided today and earlier to ODAV by the highly experienced Aviation architect and engineer Aron Faegre, reviewing this information, i see that it is straight from the FAA's own guidance. As this information was donated by airport users and airport business, it represents the best in public/private coordination, collaboration, and offers real opportunity for ODAV to create the best possible plan and save money doing so.

Thank you and please contact me with any questions.

Bruce Erik Bennett
PAC member
Aurora Airport since 1968
Bruce@AuroraAviation.com
503-709-7383

Outlook

Fw: Aurora Airport Master Plan

From Brandy Steffen <brandy.steffen@jla.us.com>
Date Tue 12/17/2024 8:58 AM
To Jen Winslow <Jen.winslow@jla.us.com>; Ashley Balsom <ashley.balsom@jla.us.com>

BRANDY STEFFEN | **JLA PUBLIC INVOLVEMENT**
Senior Program Manager + Partner
She/Her » Why pronouns matter
brandy.steffen@jla.us.com » Office 503-235-5881 » jla.us.com
Meeting + email hours 9 a.m.–5 p.m. Monday–Thursday » Administrative-only hours Friday
Check my availability » Schedule a 30 minute check-in

JLA Public Involvement's mission: To create collaborative, meaningful and exceptionally effective public processes that lead to better, more inclusive outcomes.

I will be on vacation starting Monday, 12/23/24 and will return on Monday, 01/06/25.
JLA will be closed December 24 through January 1 to allow our entire team time to rest and recover. Please get in touch early with any anticipated needs during this time. Wishing you a lovely end to 2024!

From: BEACH Anthony <Anthony.BEACH@odav.oregon.gov>
Sent: Monday, December 16, 2024 6:55 PM
To: Samantha Peterson <SPeterson@CenturyWest.com>; Brandy Steffen <brandy.steffen@jla.us.com>
Cc: THOMAS Alex R <Alex.R.THOMAS@odav.oregon.gov>
Subject: FW: Aurora Airport Master Plan

FYI, please include in the record.

Thank you,

Tony Beach
OREGON DEPARTMENT OF AVIATION
STATE AIRPORTS MANAGER
OFFICE 503-378-2523 **CELL** 503-302-5455
M-F 7:30am – 4pm

From: BEACH Anthony
Sent: Monday, December 16, 2024 6:54 PM
To: Bruce Bennett <bruce@auroraaviation.com>; SUGAHARA Kenji <Kenji.SUGAHARA@odav.oregon.gov>; THOMAS Alex R <Alex.R.THOMAS@odav.oregon.gov>
Subject: RE: Aurora Airport Master Plan

Hi Bruce, we have received this email, and the follow up email with the attachment. I've forwarded them to the master plan team.

Thank you,

Tony Beach
OREGON DEPARTMENT OF AVIATION
STATE AIRPORTS MANAGER
OFFICE 503-378-2523 **CELL** 503-302-5455
M-F 7:30am – 4pm

From: Bruce Bennett <bruce@auroraaviation.com>
Sent: Monday, December 16, 2024 5:32 PM
To: SUGAHARA Kenji <Kenji.SUGAHARA@odav.oregon.gov>; BEACH Anthony <Anthony.BEACH@odav.oregon.gov>; THOMAS Alex R <Alex.R.THOMAS@odav.oregon.gov>
Subject: Aurora Airport Master Plan

This message was sent from outside the organization. Treat attachments, links and requests with caution. Be conscious of the information you share if you respond.

December 16, 2024

Kenji Sugahara, Director, Tony Beach Airports Manager, Alex Thomas Planning Manager,
Oregon Department of Aviation
3040 25th Street SE
Salem, OR 97302

Dear Kenji, Tony, and Alex,

Thank you three for all the time spent on the FAA-required master plan for the KUAO airport.

As the Manager and owner of Blue Sky Aurora, LLC I now offer ODAV the purchase of the Aurora Airport ramp/taxi lane property parcel # 510198 (Please see property research report dated 12/12/24 attached). This 1.07-acre parcel would connect the main ODAV ramp property to the southern portion of taxiway A by extending ODAV's parcel to the taxiway A access south of the control tower. As well as significantly increasing ODAV's ramp size.

I request that this potential addition to ODAVs ramp and taxi lane be added to the master plan that is underway.

I believe that this addition will accomplish much of the benefits of the currently planed parallel taxiway and roadway without the huge costs and legal challenges of that very unpopular plan.

This parcel was created in 1996 specifically for ODAV's future use to go along with the plan at that time of ODAV purchasing all UAO property West of the "building restriction line" that existed in 1996 and for many years leading up then.

In the spirit of cooperation and collaboration I offer this parcel to ODAV at a discount of 20% off the tax value if we can conclude a transaction by the end of 2025.

Again, thank you and please contact me with any questions.

Bruce Erik Bennett
Owner, Blue Sky Aurora LLC

FIRST AMERICAN TITLE

Property Research Report

SUBJECT PROPERTY

Parcel #: 510198
Map & Taxlot #: 041W02D000600
County: Marion

OWNER
Blue Sky Aurora LLC

DATE PREPARED
Date: 12/12/2024

PREPARED BY
ngervacio@firstam.com

First American Title

Customer Service Department
503-476-8735
csfirst@firstam.com

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First American Title

Customer Service Department
503-476-8735
csfirst@firstam.com
Date: 12/12/2024

OWNERSHIP INFORMATION

Owner: Blue Sky Aurora LLC
CoOwner:
Site: Aurora OR 97002
Mail: 16840 SW Parrett Mountain Rd Sherwood OR 97140
Parcel #: 510198
Ref Parcel #: 041W02D000600
TRS: 04S / 01W / 02 / SE
County: Marion

PROPERTY DESCRIPTION

Map Grid:
Census Tract: 010202 Block: 1001
Neighborhood:
School Dist: 15 North Marion
Impr Type: 569 - Market Indaa Industrial Aurora Airport - Aircraft Hangar
Subdiv/Plat:
Land Use: 201 - Commercial improved
Std Land Use: 3000 - Commercial Office (General)
Zoning: County-P - Public
Lat/Lon: 45.247641 / -122.768277
Watershed: Senecal Creek-Pudding River
Legal: P.P. 2008-090, PARCEL 1, ACRES 1.07

ASSESSMENT AND TAXATION

Market Land: $466,090.00
Market Impr: $83,700.00
Market Total: $549,790.00 (2023)
% Improved: 15.00%
Assessed Total: $195,720.00 (2023)
Levy Code: 15610
Tax: $2,186.52 (2023)
Millage Rate: 11.1717
Exemption:
Exemption Type: N/A

PROPERTY CHARACTERISTICS

Bedrooms:	Total SqFt:	10 SqFt	Year Built:		
Baths, Total:	First Floor:	10 SqFt	Eff Year Built:		
Baths, Full:	Second Floor:		Lot Size Ac:	1.07 Acres	
Baths, Half:	Basement Fin:		Lot Size SF:	46,609 SqFt	
Total Units:	Basement Unfin:		Lot Width:		
# Stories:	Basement Total:		Lot Depth:		
# Fireplaces:	Attic Fin:		Roof Material:		
Cooling:	Attic Unfin:		Roof Shape:		
Heating:	Attic Total:		Ext Walls:		
Building Style:	Garage:		Const Type:		

SALES AND LOAN INFORMATION

Owner	Date	Doc #	Sale Price	Deed Type	Loan Amt	Loan Type
BLUE SKY AURORA LLC	06/13/2023	2023-15 (46320041)		B&S		
Blue Sky Aurora LLC	06/13/2023	2023-15 (46320041)		Deed		Conv/Unk
LEANN RENE BENNETT MANAGERS OF BLUE SKY AUROR	06/13/2022	25676		Bargain and Sale Deed		Conv/Unk
BLUE SKY AURORA LLC	10/29/2007	28820279		Warranty Deed		Conv/Unk

Sentry Dynamics, Inc. and its customers make no representations, warranties or conditions, express or implied, as to the accuracy or completeness of information contained in this report.

WARRANTY DEED

Reel 2882 Page 279

388

Vera L. Bennett,
Grantor.
Blue Sky Aurora, LLC,
Grantee.

~~After recording return to:~~
Roderick A. Boutin
Bowerman & Boutin
PO Box 100
Oregon City, Oregon 97045
✓Return: Leann Bennett

Until further notice, send tax statements to:
Blue Sky Aurora. LLC
16840 SW Parrett Mountain Road
Sherwood, Oregon 97140

WARRANTY DEED

Vera L. Bennett, Grantor, conveys and warrants to Blue Sky Aurora, LLC, Grantee, the real property situated in the County of Marion, State of Oregon, described in Exhibit "A" hereto, excepting therefrom the real property described in Exhibit "B" hereto, free of encumbrances except easements and restrictions of public record. The true and actual consideration for this conveyance consists of or includes other property or value given or promised.

BEFORE SIGNING OR ACCEPTING THIS INSTRUMENT, THE PERSON TRANSFERRING FEE TITLE SHOULD INQUIRE ABOUT THE PERSON'S RIGHTS, IF ANY, UNDER ORS 197.352. THIS INSTRUMENT DOES NOT ALLOW USE OF THE PROPERTY DESCRIBED IN THIS INSTRUMENT IN VIOLATION OF APPLICABLE LAND USE LAWS AND REGULATIONS. BEFORE SIGNING OR ACCEPTING THIS INSTRUMENT, THE PERSON ACQUIRING FEE TITLE TO THE PROPERTY SHOULD CHECK WITH THE APPROPRIATE CITY OR COUNTY PLANNING DEPARTMENT TO VERIFY APPROVED USES, TO DETERMINE ANY LIMITS ON LAWSUITS AGAINST FARMING OR FOREST PRACTICES AS DEFINED BY ORS 30.930 AND TO INQUIRE ABOUT THE RIGHTS OF NEIGHBORING PROPERTY OWNERS, IF ANY, UNDER ORS 197.352

Dated this 22nd day of October, 2007.

Vera L. Bennett

Vera L. Bennett Vera L. Bennett

STATE OF TEXAS }
}
County of Hansford }

NOTARY PUBLIC
STATE OF TEXAS
KAYLA MCLENNAN
EXPIRES 8-25-2010
COMMISSION #01137063-3

Before me personally appeared the above-named Vera L. Bennett who acknowledged the foregoing to be her voluntary act and deed.

Kayla McLennan

NOTARY PUBLIC FOR TEXAS
My commission expires:

Exhibit "A"

Real property in the County of Marion, State of Oregon, described as follows:

Parcel 1:

Parcel 1, of Partition Plat No. 96-18, recorded March 25, 1996 in Reel 1298 and Page 780, Film Records in the County of Marion, State of Oregon.

Excepting Therefrom those portions of land lying within the following deeds, recorded April 09, 1996 in Reel 1302 and Page 306, recorded August 05, 1996 in Reel 1330 and Page 64 also rerecorded in Reel 1604 and Page 504, recorded April 21, 1997 in Reel 1387 and Page 227 and recorded April 22, 1997 in Reel 1387 and Page 229, Film Records of Marion County, State of Oregon.

Parcel 2:

A tract of land situated in the Southeast 1/4 of Section 2, Township 4 South, Range 1 West, Willamette Meridian, Marion County, Oregon, described as follows:

Beginning at the East 1/4 corner of said Section 2; thence South 89° 53' 51" West along the East-West centerline of said Section 2, 951.88 feet to the Northeast corner of that tract of land conveyed to the State of Oregon by deed recorded in Volume 279 and Page 530, in Deed Records; thence South 7° 05' 20" West along the Easterly line of said State of Oregon tract, 2134.70 feet to the Southeast corner thereof, said point being the true point of beginning of the tract herein to be described; thence North 89° 49' 37" East along the South line of that tract of land conveyed to Otto Knorr, by deed recorded in Volume 152 and Page 567, in Deed Records, 808.56 feet to the Southwest corner of that tract of land conveyed to Wesleyan Methodist Church by deed recorded in Volume 522 and Page 526, in Deed Records; thence North 0° 06' 35" West along the West line of said Wesleyan Methodist Church Tract, 291.00 feet; thence South 89° 49' 37" West parallel with the South line of said Knorr Tract, 620.58 feet to a point which is 150.00 feet Southeasterly of the Easterly line of said State of Oregon Tract, when measured at right angles thereto; thence South 7° 05' 20" West parallel with said Easterly line, 79.86 feet; thence South 89° 49' 37" West parallel with the South line of said Knorr Tract, 151.22 feet to a point in the Easterly line of said State of Oregon Tract; thence South 7° 05' 20" West along said Easterly line 213.50 feet to the true point of beginning.

Excepting Therefrom that portion described in a deed recorded April 21, 1997 in Reel 1387 and Page 227, Film Records.

TOGETHER WITH a 30.00 foot wide roadway easement 15.00 feet on either side of and parallel with the following described centerline: Beginning at a point in the North line of the herein before described tract which bears South 89° 49' 37" West 15.00 feet from the Northeast corner thereof; thence North 0° 06' 35" West parallel with the West line of that tract of land conveyed to Wesleyan Methodist Church by deed recorded in Volume 522 and Page 526, in Deed Records, 261.92 feet; thence North 77° 49' 25" East along a line which is 15.00 feet Northerly of when measured at right angles to the North line of said Wesleyan Methodist Church Tract, 493.95 feet to a point in the West right of way line of Marion County Market Road No. 59

Tax Parcel Number: R10198

EXHIBIT 'B'

LEGAL DESCRIPTION:

A TRACT OF LAND LOCATED IN THE SOUTHEAST ONE-QUARTER OF SECTION 2, TOWNSHIP 4 SOUTH, RANGE 1 WEST OF THE WILLAMETTE MERIDIAN, CITY OF AURORA, MARION COUNTY, OREGON AND BEING MORE PARTICULARY DESCRIBED AS FOLLOWS:

BEGINNING AT THE NORTHWEST CORNER OF PARCEL 1 OF PARTITITION PLAT 96-18 RECORDED IN MARION COUNTY PLAT RECORDS;
THENCE NORTH 89°57'22" EAST ALONG THE NORTH LINE OF PARCEL 1, 65.50 FEET TO A POINT 365.50 FEET FROM THE CENTERLINE OF AURORA AIRPORT RUNWAY, WHEN MEASURED PERPENDICULAR THERETO;
THENCE SOUTH 07°10'21" WEST, PARALLEL TO SAID RUNWAY CENTERLINE, 596.99 FEET TO THE NORTHLINE OF THAT TRACT DESCRIBED IN REEL 2271, PAGE 472, RECORDED IN MARION COUNTY DEED RECORDS;
THENCE ON SAID NORTH LINE, SOUTH 89°47'39" WEST, 65.36 FEET TO THE WEST LINE OF PARCEL 1 OF SAID PARTITION PLAT;
THENCE ON SAID WEST LINE NORTH 07°09'24" EAST, 597.16 FEET TO THE POINT OF BEGINNING.

REEL:2882 **PAGE: 279**

October 29, 2007, 10:41 am.

CONTROL #: 209123

State of Oregon
County of Marion

I hereby certify that the attached instrument was received and duly recorded by me in Marion County records:

FEE: $ 36.00

BILL BURGESS
COUNTY CLERK

THIS IS NOT AN INVOICE.

Reel 3011 Page 274

PARTITION PLAT

PLAT # 2008-90

Applicant's Name(s):

LEANN BENNETT, MANAGER

PROPERTY OWNER'S NAME(S):

BLUE SKY AURORA, LLC, AN OREGON LIMITED LIABILITY COMPANY

Location Description:

Section: 2, Township: 4 South, Range: 1 West

Return Address:

BLUE SKY AURORA, LLC
16840 SW PARRETT MOUNTAIN ROAD
SHERWOOD, OR 97140-5035

REEL:3011 **PAGE: 274**

November 17, 2008, 04:12 pm.

CONTROL #: 237061

State of Oregon
County of Marion

I hereby certify that the attached instrument was received and duly recorded by me in Marion County records:

FEE: $ 46.00

BILL BURGESS
COUNTY CLERK

THIS IS NOT AN INVOICE.

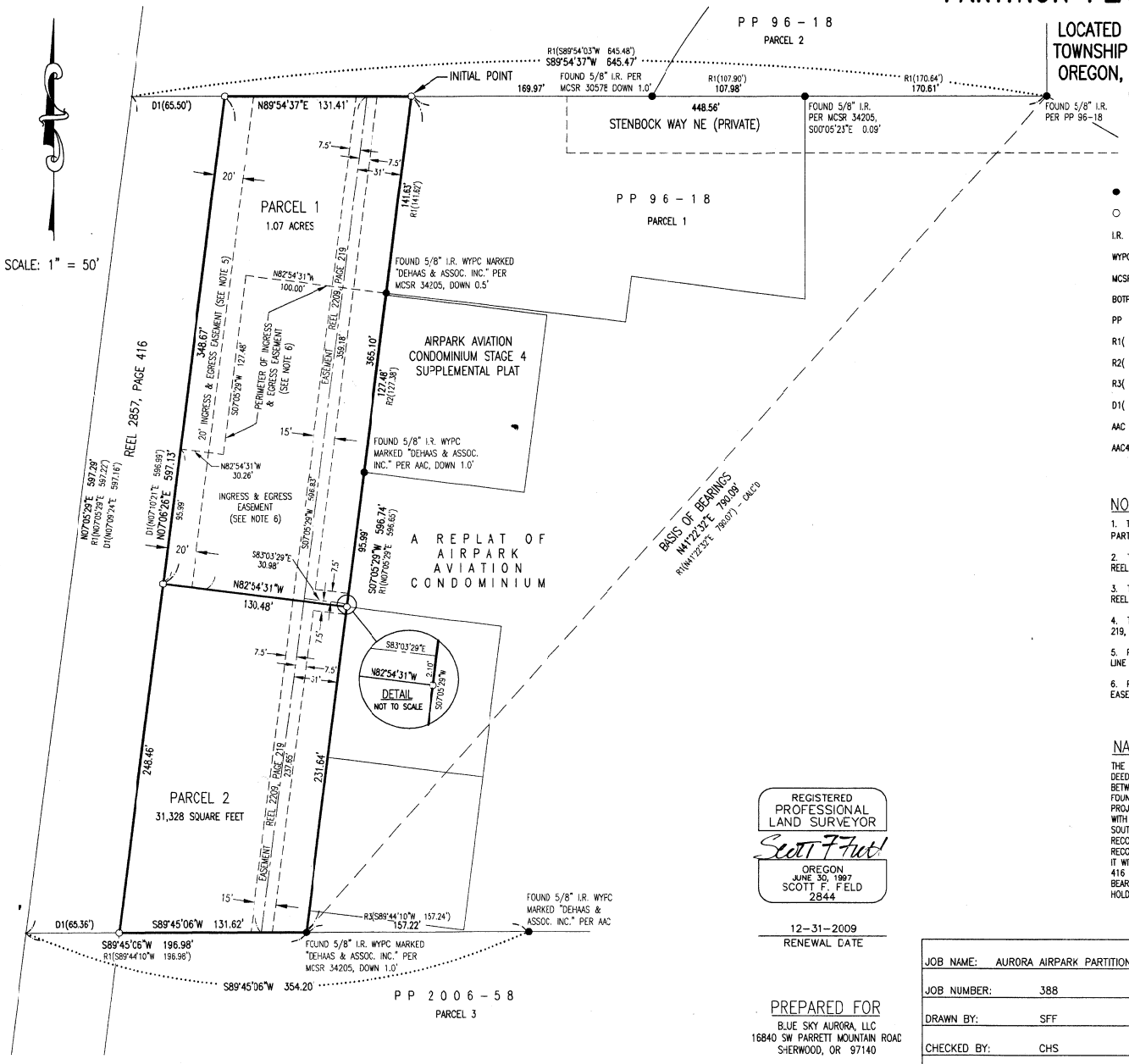
2008-90

PARTITION PLAT NO. 2008-90

LOCATED IN THE SOUTHEAST ONE-QUARTER OF SECTION 2, TOWNSHIP 4 SOUTH, RANGE 1 WEST, W.M., MARION COUNTY, OREGON, A PART THEREOF BEING A REPLAT OF A PORTION OF PARCEL 1 OF PARTITION PLAT 96-18

NOVEMBER 4, 2008

SHEET 1 OF 2



LEGEND

●	FOUND MONUMENT AS NOTED, FLUSH UNLESS NOTED OTHERWISE
○	SET 5/8" X 30" I.R. WYPC MARKED "NORTHWEST SURVEYING, INC."
I.R.	IRON ROD
WYPC	WITH YELLOW PLASTIC CAP
MCSR	SURVEY NUMBER, MARION COUNTY SURVEY RECORDS
BOTP	BOOK OF TOWN PLATS
PP	PARTITION PLAT, MARION COUNTY SURVEY RECORDS
R1( )	RECORD INFORMATION PER MCSR 34205
R2( )	RECORD INFORMATION PER AAC4
R3( )	RECORD INFORMATION PER AAC
D1( )	RECORD INFORMATION PER REEL 2857, PAGE 416
AAC	A REPLAT OF AIRPARK AVIATION CONDOMINIUM, VOL. 42, PG. 93, BOTP
AAC4	AIRPARK AVIATION CONDOMINIUM STAGE 4 SUPPLEMENTAL PLAT, VOL. 44, PG. 14, BOTP

NOTES

1. THIS PARTITION PLAT IS SUBJECT TO THE CONDITIONS OF APPROVAL OF MARION COUNTY PARTITONING CASE NO. 08-12.

2. THIS PARTITION IS SUBJECT TO THAT NONDISTURBANCE AGREEMENT RECORDED JANUARY 16, 2004 IN REEL 2263, PAGE 74, DEED RECORDS OF MARION COUNTY, OREGON.

3. THIS PARTITION IS SUBJECT TO THAT FLIGHT STRIP EASEMENT RECORDED DECEMBER 31, 1942 IN REEL 279, PAGE 91, DEED RECORDS OF MARION COUNTY, OREGON.

4. THIS PARTITION IS SUBJECT TO THAT EASEMENT RECORDED OCTOBER 2, 2003 IN REEL 2209, PAGE 219, DEED RECORDS OF MARION COUNTY, OREGON, AS SHOWN AND NOTED.

5. PARCEL 1 IS SUBJECT TO A 20.00 FOOT WIDE INGRESS AND EGRESS EASEMENT ALONG ITS WESTERLY LINE AS SHOWN AND NOTED. SAID EASEMENT IS FOR THE BENEFIT OF PARCEL 2.

6. PARCEL 1 IS SUBJECT TO AN INGRESS AND EGRESS EASEMENT AS SHOWN AND NOTED. SAID EASEMENT IS FOR THE BENEFIT OF AURORA AIRPARK CONDOMINIUM ASSOCIATION, INC.

NARRATIVE

THE PURPOSE OF THIS SURVEY IS TO PARTITION THAT PROPERTY DESCRIBED IN REEL 2882, PAGE 279, DEED RECORDS OF MARION COUNTY, OREGON. MY BASIS OF BEARING IS A CALCULATED BEARING BETWEEN FOUND MONUMENTS AS SHOWN AND NOTED PER MCSR 34205. FOR THE NORTH LINE I HELD FOUND MONUMENTS AT THE SOUTHEAST AND SOUTHWEST CORNERS OF PARCEL 2 OF PP 96-18 AND PROJECTED THIS LINE WESTERLY. I HELD THE FOUND MONUMENT AT THE SOUTHEAST CORNER TOGETHER WITH THE FOUND MONUMENT TO THE EAST AND PROJECTED THIS LINE WESTERLY TO ESTABLISH THE SOUTHERLY LINE. I ESTABLISHED THE SOUTHWEST CORNER OF REEL 2857, PAGE 416 ON THIS LINE AT RECORD DISTANCE FROM THE SOUTHEAST CORNER HOLDING INFORMATION PER MCSR 34205. I HELD THE RECORD BEARING FROM MCSR 34205 FOR THE WEST LINE OF REEL 2857, PAGE 416 AND INTERSECTED IT WITH THE NORTH LINE TO ESTABLISH ITS NORTHWEST CORNER. THE EAST LINE OF REEL 2857, PAGE 416 WAS ESTABLISHED BY HOLDING DEED DISTANCES ALONG THE NORTH AND SOUTH LINES AND A BEARING ROTATED TO THE WEST LINE. THE EAST LINE OF THE SUBJECT PROPERTY WAS ESTABLISHED BY HOLDING THE SOUTHEAST CORNER AND FOUND MONUMENTS AS SHOWN.

REGISTERED PROFESSIONAL LAND SURVEYOR

Scott F. Feld

OREGON
JUNE 30, 1997
SCOTT F. FELD
2844

12-31-2009
RENEWAL DATE

PREPARED FOR
BLUE SKY AURORA, LLC
16840 SW PARRETT MOUNTAIN ROAD
SHERWOOD, OR 97140

JOB NAME:	AURORA AIRPARK PARTITION
JOB NUMBER:	388
DRAWN BY:	SFF
CHECKED BY:	CHS
DRAWING NO:	388 PLAT

BOUNDARY TOPOGRAPHIC CONSTRUCTION CADASTRAL

NORTHWEST SURVEYING, Inc.

1815 NW 169TH PLACE, SUITE 209C
BEAVERTON, OR 97006
PHONE: (503) 848-2127 FAX: (503) 848-2179

2008-90

PARTITION PLAT NO. 2008-90

LOCATED IN THE SOUTHEAST ONE-QUARTER OF SECTION 2, TOWNSHIP 4 SOUTH, RANGE 1 WEST, W.M., MARION COUNTY, OREGON, A PART THEREOF BEING A REPLAT OF A PORTION OF PARCEL 1 OF PARTITION PLAT 96-18

NOVEMBER 4, 2008

SHEET 2 OF 2

SURVEYOR'S CERTIFICATE

I, SCOTT F. FIELD, HEREBY CERTIFY THAT I HAVE CORRECTLY SURVEYED AND MARKED WITH PROPER MONUMENTS THE LAND SHOWN ON THE ATTACHED PARTITION PLAT, SAID LAND BEING LOCATED IN THE SOUTHEAST ONE-QUARTER OF SECTION 2, TOWNSHIP 4 SOUTH, RANGE 1 WEST, WILLAMETTE MERIDIAN, MARION COUNTY, OREGON, A PART THEREOF BEING A REPLAT OF A PORTION OF PARCEL 1 OF PARTITION PLAT 96-18 AND BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS:

COMMENCING AT A 5/8 INCH IRON ROD LOCATED AT THE SOUTHEAST CORNER OF PARCEL 2 OF PARTITION PLAT 96-18; THENCE ALONG THE SOUTHERLY LINE OF SAID PARCEL 2 AND THE WESTERLY EXTENSION THEREOF, SOUTH 89°54'37" WEST A DISTANCE OF 448.56 FEET TO A 5/8 INCH IRON ROD LOCATED AT THE NORTHEAST CORNER OF THAT PROPERTY CONVEYED TO BLUE SKY AURORA, LLC BY DEED RECORDED OCTOBER 29, 2007 IN REEL 2882, PAGE 279, DEED RECORDS OF MARION COUNTY, OREGON, BEING THE INITIAL POINT; THENCE ALONG THE EASTERLY LINE OF SAID BLUE SKY AURORA, LLC PROPERTY SOUTH 07°05'29" WEST A DISTANCE OF 596.74 FEET TO A 5/8 INCH IRON ROD LOCATED AT THE SOUTHEAST CORNER THEREOF; THENCE ALONG THE SOUTHERLY LINE OF SAID BLUE SKY AURORA LLC PROPERTY SOUTH 89°45'06" WEST A DISTANCE OF 131.62 FEET TO A 5/8 INCH IRON ROD LOCATED AT THE SOUTHEAST CORNER OF THAT PROPERTY CONVEYED TO THE STATE OF OREGON BY DEED RECORDED AUGUST 24, 2007 IN REEL 2857, PAGE 416, DEED RECORDS OF MARION COUNTY, OREGON; THENCE ALONG THE EASTERLY LINE OF SAID STATE OF OREGON PROPERTY NORTH 07°06'26" EAST A DISTANCE OF 597.13 FEET TO A 5/8 INCH IRON ROD LOCATED AT THE NORTHEAST CORNER THEREOF, SAID POINT BEING ALSO THE NORTHWEST CORNER OF SAID BLUE SKY AURORA, LLC PROPERTY; THENCE ALONG THE NORTHERLY LINE OF SAID BLUE SKY AURORA, LLC PROPERTY NORTH 89°54'37" EAST A DISTANCE OF 131.41 FEET TO THE INITIAL POINT.

SAID DESCRIBED TRACT OF LAND CONTAINS 1.79 ACRES, MORE OR LESS.

REGISTERED PROFESSIONAL LAND SURVEYOR
Scott F Field
OREGON
JUNE 30, 1997
SCOTT F. FIELD
2844

12-31-2009
RENEWAL DATE

DECLARATION

KNOW ALL PEOPLE BY THESE PRESENTS THAT BLUE SKY AURORA, LLC, AN OREGON LIMITED LIABILITY COMPANY, IS THE OWNER OF THE LAND REPRESENTED ON THE ANNEXED MAP AND MORE PARTICULARLY DESCRIBED IN THE ACCOMPANYING SURVEYOR'S CERTIFICATE, HAS CAUSED THE SAME TO BE PLATTED INTO PARCELS, AS SHOWN ON THE ANNEXED MAP, AND DOES HEREBY GRANT ALL EASEMENTS SET FORTH FOR THE USES STATED AND AS INDICATED HEREON.

BY: Leann Bennett
BLUE SKY AURORA, LLC
LEANN BENNETT, MANAGER

ACKNOWLEDGMENT

STATE OF OREGON)
) S.S.
COUNTY OF Washington)

THIS INSTRUMENT WAS ACKNOWLEDGED BEFORE ME ON November 5, 2008 BY LEANN BENNETT AS MANAGER OF BLUE SKY AURORA, LLC.

NOTARY SIGNATURE
Jeannia Stubbs
NOTARY PUBLIC-OREGON

COMMISSION NO. 411C35

MY COMMISSION EXPIRES November 5, 2010

MARION COUNTY APPROVALS

APPROVED THIS 14 DAY OF NOVEMBER, 2008
MARION COUNTY PLANNING COMMISSION DIRECTOR
CASE NO. 08-012
BY Sterling Anderson

APPROVED THIS 12TH DAY OF NOVEMBER, 2008
MARION COUNTY SURVEYOR
BY Mark Riggin

APPROVED THIS 17 DAY OF November, 2008
MARION COUNTY ASSESSOR
BY Richard K. Kreitzer by Irma M. Sains

ALL TAXES, FEES, ASSESSMENTS OR OTHER CHARGES AS PROVIDED BY ORS 92.095 HAVE BEEN PAID AS OF June 30, 2008, 2009
MARION COUNTY TAX COLLECTOR
BY Richard K. Kreitzer by Sharon Busch

STATE OF OREGON)
) S.S.
COUNTY OF MARION)

I, DO HEREBY CERTIFY THAT THIS PARTITION PLAT NO. 2008-90 WAS RECEIVED FOR RECORD ON THIS 17th DAY OF November, 2008 AT 4:12 O'CLOCK P. M., AND RECORDED IN THE IN THE RECORD OF PARTITION PLATS. ALSO REFERENCED IN MARION COUNTY DEED RECORDS, REEL 3011, PAGE 274

BY Jenni Welbon
DEPUTY COUNTY CLERK

PREPARED FOR
BLUE SKY AURORA, LLC
16840 SW PARRETT MOUNTAIN ROAD
SHERWOOD, OR 97140

JOB NAME:	AURORA AIRPARK PARTITION
JOB NUMBER:	388
DRAWN BY:	SFF
CHECKED BY:	CHS
DRAWING NO:	388 PLAT

NORTHWEST SURVEYING, Inc.
BOUNDARY TOPOGRAPHIC CONSTRUCTION CADASTRAL
1815 NW 169TH PLACE, SUITE 2090
BEAVERTON, OR 97006
PHONE: (503) 848-2127 FAX: (503) 848-2179

Outlook

Complaint about Aurora State Airport

From Leann Bennett <leannrbennett@gmail.com>

Date Thu 2024-06-13 9:04 AM

To ree_armitage@wyden.senate.gov <ree_armitage@wyden.senate.gov>; sydney_beasley@wyden.senate.gov <sydney_beasley@wyden.senate.gov>; Sara_Schmitt@merkley.senate.gov <Sara_Schmitt@merkley.senate.gov>; Serena_Baserman@merkley.senate.gov <Serena_Baserman@merkley.senate.gov>; Erin.Chen@mail.house.gov <Erin.Chen@mail.house.gov>; KUNSE Suzanne <Suzanne.kunse@mail.house.gov>; Governor Kotek * GOV <Governor.Kotek@oregon.gov>; WARNER Chris * GOV <Chris.WARNER@oregon.gov>; MCCOLAUGH Annie * GOV <Annie.MCCOLAUGH@oregon.gov>; PORTERFIELD Amelia * GOV <Amelia.Porterfield@oregon.gov>; BROOKS Kelly S * GOV <Kelly.S.BROOKS@oregon.gov>; Sen Girod <GirodF@oregonlegislature.gov>; Sen Woods <WoodsA@oregonlegislature.gov>; Rep Lewis <LewisR@oregonlegislature.gov>; Rep Neron <NeronC@oregonlegislature.gov>; Mayor@ci.wilsonville.or.us <Mayor@ci.wilsonville.or.us>; mayor@ci.aurora.or.us <mayor@ci.aurora.or.us>; SUGAHARA Kenji <Kenji.SUGAHARA@odav.oregon.gov>; BEACH Anthony <Anthony.BEACH@odav.oregon.gov>; william.garrison@faa.gov <william.garrison@faa.gov>; timothy.a.house@faa.gov <timothy.a.house@faa.gov>; Oregon Department of Aviation <mail.aviation@ODAV.oregon.gov>; noise.aviation@odav.oregon <noise.aviation@odav.oregon>

Some people who received this message don't often get email from leannrbennett@gmail.com. Learn why this is important

Good Day!

I am writing of support for the Aurora airport runway extension.

This airport is so critically important to our area, providing over 1200 jobs, providing fire fighting equipment and expertise (Columbia Helicopter/HTC) and life saving services (Lifeflight/ organ transport services).
Adding 500' to the runway will make the airport safer as any pilot can attest. Having lost a best friend in an airplane accident at Coos Bay/South Bend off the end of the runway, I know this is a life or death solution.

Please support this extension which has been part of the master plan since the 70's for safety reasons. This is also ground zero for subduction earthquake disaster relief. ODART is doing a simulation soon in support of this.

Look at the big picture. Airplanes fly over every corner of the United States- (except military restricted zones).
They use navigational way points to travel. People near those way points are just as equally affected by airplanes as those near an airport and do they send you their complaints?
I recently sold a $2,000,000 home across the street from the Newberg VOR on Chehalem Mountain. They were not concerned in the least about aircraft traffic.

Thank you for your time and consideration,

Leann Bennett, Principal Broker
Metro-West Realty
LeannRBennett@gmail.com
503-504-6772 Cell
503-692-3050 Office



Outlook

Fw: The Aurora Airport master plan

From Brandy Steffen <brandy.steffen@jla.us.com>
Date Tue 11/19/2024 4:16 PM
To Jen Winslow <Jen.winslow@jla.us.com>; Ashley Balsom <ashley.balsom@jla.us.com>

BRANDY STEFFEN | **JLA PUBLIC INVOLVEMENT**
Partner + Senior Program Manager
brandy.steffen@jla.us.com » Schedule a 30 minute meeting

From: BEACH Anthony <Anthony.BEACH@odav.oregon.gov>
Sent: Tuesday, November 12, 2024 6:04 AM
To: Samantha Peterson <SPeterson@CenturyWest.com>; Brandy Steffen <brandy.steffen@jla.us.com>
Cc: THOMAS Alex R <Alex.R.THOMAS@odav.oregon.gov>
Subject: FW: The Aurora Airport master plan

Good morning, please include in the record.

Thank you,

Tony Beach
OREGON DEPARTMENT OF AVIATION
STATE AIRPORTS MANAGER
OFFICE 503-378-2523 **CELL** 503-302-5455
M-F 7:30am – 4pm

From: BEACH Anthony
Sent: Tuesday, November 12, 2024 6:04 AM
To: Randal Beyers <allwxrnr@gmail.com>; THOMAS Alex R <Alex.R.THOMAS@odav.oregon.gov>
Cc: Bruce Bennett <bruce@auroraaviation.com>
Subject: RE: The Aurora Airport master plan

Hi Randal, thank you for your comments, I have forwarded them to the master plan team and they'll be included in the record.

Tony Beach
OREGON DEPARTMENT OF AVIATION
STATE AIRPORTS MANAGER
OFFICE 503-378-2523 **CELL** 503-302-5455
M-F 7:30am – 4pm

From: Randal Beyers <allwxrnr@gmail.com>
Sent: Sunday, November 10, 2024 3:07 PM
To: THOMAS Alex R <Alex.R.THOMAS@odav.oregon.gov>; BEACH Anthony <Anthony.BEACH@odav.oregon.gov>
Cc: Bruce Bennett <bruce@auroraaviation.com>
Subject: The Aurora Airport master plan

Some people who received this message don't often get email from allwxrnr@gmail.com. Learn why this is important

This message was sent from outside the organization. Treat attachments, links and requests with caution. Be conscious of the information you share if you respond.

Gentlemen:

As an Oregon Native and lifelong resident, mostly under the flight pattern of KUAO, I would like to register and make part of the master plan record my very strong objection to the destruction of any privately owned hangars on the Aurora Airport.

As a professional military and airline pilot with nearly 50 years experience, I am very much interested in local aviation operations. In order to be operated safely aircraft need to be stored and maintained properly. Hangars are essential for this, as well as providing needed and meaningful employment. There is already a significant shortage of hangars at Aurora. Therefore, destroying hangars for a vehicle lane that could be easily located elsewhere makes no sense. In fact, locating the vehicle lane further from the taxiway would improve safety. There appears to be more than adequate space behind the hangars to the east to do this without the elimination of any hangar space.

I favor airport improvements but elimination of hangars in favor of a road next to a taxiway will certainly not improve safety.

Thank you.

Respectfully,
Randal Beyers
(Major, USMCR, Ret)



Outlook

Fw: Urgent Input on Aurora Airport Master Plan

From Brandy Steffen <brandy.steffen@jla.us.com>
Date Mon 2025-01-06 8:56 AM
To Jen Winslow <Jen.winslow@jla.us.com>; Ashley Balsom <ashley.balsom@jla.us.com>

BRANDY STEFFEN | **JLA PUBLIC INVOLVEMENT**
Senior Program Manager + Partner
She/Her » Why pronouns matter
brandy.steffen@jla.us.com » Office 503-235-5881 » jla.us.com
Meeting + email hours 9 a.m.–5 p.m. Monday–Thursday » Administrative-only hours Friday
Check my availability » Schedule a 30 minute check-in

JLA Public Involvement's mission: To create collaborative, meaningful and exceptionally effective public processes that lead to better, more inclusive outcomes.

Please note: I will be on vacation, without access to my email, starting Friday, 01/24/25 and returning Monday, 02/03/25.

From: THOMAS Alex R <Alex.R.THOMAS@odav.oregon.gov>
Sent: Monday, December 23, 2024 8:50 AM
To: Brandy Steffen <brandy.steffen@jla.us.com>; Samantha Peterson <SPeterson@CenturyWest.com>; BEACH Anthony <Anthony.BEACH@odav.oregon.gov>
Subject: FW: Urgent Input on Aurora Airport Master Plan

Hello,

Good morning. Please include within the UAO record.

ALEX THOMAS
OREGON DEPARTMENT OF AVIATION (ODAV)
POLICY, PLANNING, & PROGRAMS MANAGER

CELL 971-375-2357

EMAIL Alex.R.Thomas@ODAV.Oregon.Gov

SALEM, OR 97302

WWW.OREGON.GOV/AVIATION

Schedule a meeting with me.

Schedule a meeting with any of the programs listed below.

Alternative Contacts:
COAR Grants: Grants@ODAV.Oregon.Gov

Procurement / Contracts: Contracts@ODAV.Oregon.Gov
Pavement (PEP/PMP): Pavement@ODAV.Oregon.Gov
Land Use / Tall Structure: LandUse@ODAV.Oregon.Gov

*****CONFIDENTIALITY NOTICE*****

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From: Jonathan Bieganski <JonathanBieganski@outlook.com>
Date: Monday, December 23, 2024 at 08:29
To: THOMAS Alex R <Alex.R.THOMAS@odav.oregon.gov>
Subject: Urgent Input on Aurora Airport Master Plan

You don't often get email from jonathanbieganski@outlook.com. Learn why this is important

This message was sent from outside the organization. Treat attachments, links and requests with caution. Be conscious of the information you share if you respond.

Dear Alex Thomas,

As a pilot flying out of Aurora State Airport (KUAO), a member of the Columbia Aviation Association and a local business owner of Willamette Drones, I urge you to reconsider the proposed condemnation and destruction of aircraft hangars in the Aurora Airport Master Plan.

The hangars play a vital role in supporting the aviation community, local businesses, and the overall infrastructure of the airport. Removing them would have significant negative impacts on pilots, aircraft owners, and the broader aviation ecosystem.

Thank you for considering this input as you move forward with the planning process. Please register my urgent request to preserve these critical assets at KUAO.

Best regards,

Jonathan Bieganski
Program Co-Chair | Columbia Aviation Association
Founder | Willamette Drones
(503) 710-1548 | jonathanbieganski@outlook.com

Outlook

Fw: Aurora Airport Master Plan

From Brandy Steffen <brandy.steffen@jla.us.com>
Date Wed 12/18/2024 11:13 AM
To Jen Winslow <Jen.winslow@jla.us.com>; Ashley Balsom <ashley.balsom@jla.us.com>

BRANDY STEFFEN | **JLA PUBLIC INVOLVEMENT**
Senior Program Manager + Partner
She/Her » Why pronouns matter
brandy.steffen@jla.us.com » Office 503-235-5881 » jla.us.com
Meeting + email hours 9 a.m.–5 p.m. Monday–Thursday » Administrative-only hours Friday
Check my availability » Schedule a 30 minute check-in

JLA Public Involvement's mission: To create collaborative, meaningful and exceptionally effective public processes that lead to better, more inclusive outcomes.

I will be on vacation starting Monday, 12/23/24 and will return on Monday, 01/06/25.
JLA will be closed December 24 through January 1 to allow our entire team time to rest and recover. Please get in touch early with any anticipated needs during this time. Wishing you a lovely end to 2024!

From: THOMAS Alex R <Alex.R.THOMAS@odav.oregon.gov>
Sent: Wednesday, December 18, 2024 10:40 AM
To: Brandy Steffen <brandy.steffen@jla.us.com>; Samantha Peterson <SPeterson@CenturyWest.com>; BEACH Anthony <Anthony.BEACH@odav.oregon.gov>
Subject: FW: Aurora Airport Master Plan

Hello,

Good morning. Please include within the UAO record.

ALEX THOMAS
OREGON DEPARTMENT OF AVIATION (ODAV)
POLICY, PLANNING, & PROGRAMS MANAGER

CELL 971-375-2357
EMAIL Alex.R.Thomas@ODAV.Oregon.Gov
SALEM, OR 97302
WWW.OREGON.GOV/AVIATION

Schedule a meeting with me.

Schedule a meeting with any of the programs listed below.

Alternative Contacts:

COAR Grants: Grants@ODAV.Oregon.Gov
Procurement / Contracts: Contracts@ODAV.Oregon.Gov
Pavement (PEP/PMP): Pavement@ODAV.Oregon.Gov
Land Use / Tall Structure: LandUse@ODAV.Oregon.Gov

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From: Kathy Bieganski <kathleenbieganski@gmail.com>
Date: Wednesday, December 18, 2024 at 10:34
To: THOMAS Alex R <Alex.R.THOMAS@odav.oregon.gov>
Subject: Aurora Airport Master Plan

You don't often get email from kathleenbieganski@gmail.com. Learn why this is important

This message was sent from outside the organization. Treat attachments, links and requests with caution. Be conscious of the information you share if you respond.

Oregon Department of Aviation
Alex Thomas
ODAV Planning and Programs Manager
503-378-4880

Dear ODAV c/o Alex Thomas

As a pilot that flies off KUAO, please register and record my URGENT input for the Aurora Airport Master Plan that is underway not to consider the condemnation and destruction of any aircraft hangars.
Thank you,
Kathleen H Bieganski

Outlook

Fw: Refined Prelim Alternatives

From Brandy Steffen <brandy.steffen@jla.us.com>
Date Wed 12/18/2024 9:51 AM
To Jen Winslow <Jen.winslow@jla.us.com>; Ashley Balsom <ashley.balsom@jla.us.com>

BRANDY STEFFEN | **JLA PUBLIC INVOLVEMENT**
Senior Program Manager + Partner
She/Her » Why pronouns matter
brandy.steffen@jla.us.com » Office 503-235-5881 » jla.us.com
Meeting + email hours 9 a.m.–5 p.m. Monday–Thursday » Administrative-only hours Friday
Check my availability » Schedule a 30 minute check-in

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JLA will be closed December 24 through January 1 to allow our entire team time to rest and recover. Please get in touch early with any anticipated needs during this time. Wishing you a lovely end to 2024!

From: THOMAS Alex R <Alex.R.THOMAS@odav.oregon.gov>
Sent: Wednesday, December 18, 2024 9:39 AM
To: Brandy Steffen <brandy.steffen@jla.us.com>; Samantha Peterson <SPeterson@CenturyWest.com>; BEACH Anthony <Anthony.BEACH@odav.oregon.gov>
Subject: FW: Refined Prelim Alternatives

Hello,

Good morning. Please include within the UAO record.

ALEX THOMAS
OREGON DEPARTMENT OF AVIATION (ODAV)
POLICY, PLANNING, & PROGRAMS MANAGER

CELL 971-375-2357

EMAIL Alex.R.Thomas@ODAV.Oregon.Gov

SALEM, OR 97302

WWW.OREGON.GOV/AVIATION

Schedule a meeting with me.

Schedule a meeting with any of the programs listed below.

Alternative Contacts:

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Procurement / Contracts: Contracts@ODAV.Oregon.Gov
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From: Stephen Brenneke <stephen@brenneke.net>
Date: Wednesday, December 18, 2024 at 09:22
To: THOMAS Alex R <Alex.R.THOMAS@odav.oregon.gov>
Subject: Refined Prelim Alternatives

You don't often get email from stephen@brenneke.net. Learn why this is important

This message was sent from outside the organization. Treat attachments, links and requests with caution. Be conscious of the information you share if you respond.

Mr. Alex R Thomas:

Please avoid any loss of existing hangers at KUAO. These losses would devastate the owners and the airport community. I understand you need to make changes but you have alternatives such as moving the highway and the runway to the west in plan Refined Alternative 1B.

Thank you for consideration,

Steve Brenneke
Aircraft owner and hanger renter KUAO
President of Columbia Aviation Association 2025
(note clubhouse on the airport for the last 25 years)

Outlook

Re: Aurora State Airport Master Plan Website Comments - stephen Brenneke

---

From Brandy Steffen <brandy.steffen@jla.us.com>
Date Tue 11/19/2024 4:11 PM
To stephen@brenneke.net <stephen@brenneke.net>

Hello Stephen,

Thank you for your comments. We will share this with the technical team.

Thank you,
BRANDY STEFFEN | **JLA PUBLIC INVOLVEMENT**
Partner + Senior Program Manager
brandy.steffen@jla.us.com

From: stephen Brenneke <noreply@jotform.com>
Sent: Wednesday, November 13, 2024 4:00 PM
To: JLA Tech Support <tech@jla.us.com>; Jen Winslow <Jen.winslow@jla.us.com>; Ashley Balsom <ashley.balsom@jla.us.com>; Brandy Steffen <brandy.steffen@jla.us.com>
Subject: Re: Aurora State Airport Master Plan Website Comments - stephen Brenneke

Aurora State Airport Master Plan Website Comments

Name	stephen Brenneke
Organization	Columbia Pilots Association
Comments or questions?	I have read over the proposed changes to the runway and taxiways at KUAO. These are totally unacceptable. There needs to be other solutions. More input from the aviation community. Thank you, Steve Brenneke I would like to receive email updates.
If you would like a response, please tell us the best way to contact you:	Email
Email	Stephen@brenneke.net
Phone Number	[redacted]

You can edit this submission and view all your submissions easily.

Outlook

Re: Aurora State Airport Master Plan Website Comments - stephen Brenneke

---

From Brandy Steffen <brandy.steffen@jla.us.com>
Date Tue 11/19/2024 4:09 PM
To stephen@brenneke.net <stephen@brenneke.net>

Hello Stephen,

Thank you for your comments. We will share this with the technical team.

Thank you,
BRANDY STEFFEN | **JLA PUBLIC INVOLVEMENT**
Partner + Senior Program Manager
brandy.steffen@jla.us.com

From: stephen Brenneke <noreply@jotform.com>
Sent: Monday, November 18, 2024 10:30 AM
Subject: Re: Aurora State Airport Master Plan Website Comments - stephen Brenneke

Aurora State Airport Master Plan Website Comments

Name	stephen Brenneke
Organization	self
Comments or questions?	I have reviewed the plans for KUAO by the appropriate state agencies. It appears that it has been decided that the tower and a number of hangars would be removed and or moved to allow a passageway east of the Alpha taxiway for movement of fuel trucks etc and moving the runway to the East. As laudable and necessary as that is basically this would be a disaster for the community. This may impact multiple structures that exist east of the taxiway. The hangar space could not be replaced as there is not enough land to do this. The economics of condemning a hanger would be economically a disaster for the owners. Hangar space is at a premium currently as I personally know many pilots that would like to buy an aircraft

	but don't as there is no place to hangar it. If the agencies want to devastate the airport then continue with the proposal and we will suffer the consequences. If someone of the agencies actually saw and personally experienced the consequences, I am sure this proposal would not be suggested nor approved. The other alternative is to move the highway westward. This would be of little consequence to the airport businesses as only a temporary inconvenience for the airport. Please have some consideration to the airport community and do not devastate KUAO a highly successful functioning and laudable general aviation airport since the early 1940's. I would like to receive email updates.
If you would like a response, please tell us the best way to contact you:	Email
Email	Stephen@brenneke.net
Phone Number	[redacted]

You can edit this submission and view all your submissions easily.

Outlook

Fw: UAO PAC Alternate Request

From Brandy Steffen <brandy.steffen@jla.us.com>
Date Thu 12/12/2024 1:11 PM
To Jen Winslow <Jen.winslow@jla.us.com>; Ashley Balsom <ashley.balsom@jla.us.com>

BRANDY STEFFEN | JLA PUBLIC INVOLVEMENT
Senior Program Manager + Partner
She/Her » Why pronouns matter
brandy.steffen@jla.us.com » Office 503-235-5881 » jla.us.com
Meeting + email hours 9 a.m.–5 p.m. Monday–Thursday » Administrative-only hours Friday
Check my availability » Schedule a 30 minute check-in

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JLA will be closed December 24 through January 1 to allow our entire team time to rest and recover. Please get in touch early with any anticipated needs during this time. Wishing you a lovely end to 2024!

From: SUGAHARA Kenji <Kenji.SUGAHARA@odav.oregon.gov>
Sent: Thursday, December 12, 2024 12:10 PM
To: BEACH Anthony <Anthony.BEACH@odav.oregon.gov>; Brandy Steffen <brandy.steffen@jla.us.com>; Brownlee, Trent <Trent.brownlee@atlanticaviation.com>; Ted Millar <tmillar@wwpmi.com>; Bickford, Jon <Jon.Bickford@atlanticaviation.com>; BROOKS Kelly S * GOV <Kelly.S.BROOKS@oregon.gov>
Subject: Re: UAO PAC Alternate Request

Tony H. - your recollection is incorrect.

If anything, any discussion about a last minute alternate substitution was about how inappropriate it was and how we would be providing additional time for public comment to accommodate former Sen. Johnson if she so wished.

We are looking to prevent process issues that would likely result in litigation from those opposing the master plan.

From: BEACH Anthony <Anthony.BEACH@odav.oregon.gov>
Sent: Thursday, December 12, 2024 12:02 PM

To: SUGAHARA Kenji <Kenji.SUGAHARA@odav.oregon.gov>
Subject: Fw: UAO PAC Alternate Request

FYI

Tony Beach
Oregon Department of Aviation
State Airports Manager
(503) 378-2523

From: BEACH Anthony
Sent: Thursday, December 12, 2024 8:02:56 AM
To: Helbling, Tony <helbling@wilsonconst.com>; Brandy Steffen <brandy.steffen@jla.us.com>
Cc: Trent Brownlee <Trent.Brownlee@atlanticaviation.com>; Ted L. MILLAR <tmillar@wwpmi.com>; Jon.Bickford@atlanticaviation.com <Jon.Bickford@atlanticaviation.com>; THOMAS Alex R <Alex.R.THOMAS@odav.oregon.gov>; Trent Brownlee <Trent.Brownlee@atlanticaviation.com>; THOMAS Alex R <Alex.R.THOMAS@odav.oregon.gov>
Subject: RE: UAO PAC Alternate Request

Hi Tony,

I don't remember laughing about that specifically, but we'll include your comments in the record. Yes we did receive a few last second and conflicting requests to change PAC representation or add alternates within an 80 minutes of the meeting starting. I explained why we would not make these changes so close to the meeting, and that the public would have ample opportunity to comment in the meeting and provide all of their comments in full in writing. That opportunity was provided in the meeting, and we went overtime to allow the public to provide additional comment.

Regarding Mr. Brownlee's request, he was replaced on the PAC by Jon Bickford when he took over for Trent as GM for Atlantic Aviation at UAO back in September. As a reminder, the latest PAC list is on the website here: https://publicproject.net/auroraairport#

Thanks for your comments and input in the PAC meeting,

Tony Beach
OREGON DEPARTMENT OF AVIATION
STATE AIRPORTS MANAGER
OFFICE 503-378-2523 **CELL** 503-302-5455
M-F 7:30am – 4pm

From: Helbling, Tony <helbling@wilsonconst.com>
Sent: Wednesday, December 11, 2024 9:23 PM
To: Brandy Steffen <brandy.steffen@jla.us.com>
Cc: Trent Brownlee <Trent.Brownlee@atlanticaviation.com>; Ted L. MILLAR <tmillar@wwpmi.com>; Jon.Bickford@atlanticaviation.com; BEACH Anthony <Anthony.BEACH@odav.oregon.gov>; THOMAS Alex R <Alex.R.THOMAS@odav.oregon.gov>; Trent Brownlee <Trent.Brownlee@atlanticaviation.com>; BEACH Anthony <Anthony.BEACH@odav.oregon.gov>; THOMAS Alex R <Alex.R.THOMAS@odav.oregon.gov>
Subject: Re: UAO PAC Alternate Request

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Please enter into the record that I logged into the PAC meeting approximately 7 minutes before it started where I heard you, Tony Beach and Kenji Sugahara laughing about about not letting Senator Betsy Johnson be allowed to represent Atlantic Aviation. It is clear to me the request was received before the start of the meeting and was clearly known to you.

Tony Helbling
Logistics Manager
Wilson Construction Co.

Sent from my iPhone: (503) 519-6059

On Dec 11, 2024, at 3:20 PM, Brandy Steffen <brandy.steffen@jla.us.com> wrote:

Hi Trent,

I apologize for not responding yesterday, I was preparing for the meeting.

Currently Jon Bickford is the Atlantic Aviation representative on the PAC and no alternate is listed.

If Atlantic Aviation would like to make a change to your representation on the PAC, please let me know ASAP so I can get the right people on our email list and update our membership list on the website.

Thank you,
BRANDY STEFFEN | JLA PUBLIC INVOLVEMENT
Partner + Senior Program Manager
brandy.steffen@jla.us.com » Schedule a 30 minute meeting

From: Brownlee, Trent <Trent.Brownlee@atlanticaviation.com>
Sent: Tuesday, December 10, 2024 4:41 PM
To: Brandy Steffen <brandy.steffen@jla.us.com>
Cc: Ted L. MILLAR <tmillar@wwpmi.com>; Tony Helbling <helbling@wilsonconst.com>
Subject: UAO PAC Alternate Request

Hi Brandy,

I won't be able to join the PAC meeting and request that Betsy Johnson be my alternate for the PAC meeting tonight, is that something you can accommodate? I appreciate your help with this.

Thanks,

Trent Brownlee
General Manager - PDX

T: 503 678-1336 | M: 916 496-0640
trent.brownlee@atlanticaviation.com

Outlook

Re: Aurora State Airport Master Plan Website Comments - George Buley

From Jen Winslow <Jen.winslow@jla.us.com>
Date Thu 1/2/2025 4:54 PM
To georgebuley@yahoo.com <georgebuley@yahoo.com>
Cc Brandy Steffen <brandy.steffen@jla.us.com>; Ashley Balsom <ashley.balsom@jla.us.com>

Hi George,

Thank you for your comment and for attending the PAC meeting last month. I have forwarded this to the master plan team.

Thanks,
JEN WINSLOW | **JLA PUBLIC INVOLVEMENT**
Program Manager
She/Her » Why pronouns matter
jen.winslow@jla.us.com » Cell 503-367-6447 » Office 503-235-5881 » jla.us.com

Work hours 9 a.m.–5 p.m. Monday–Friday

From: George Buley <noreply@jotform.com>
Sent: Monday, December 23, 2024 1:36 PM
To: JLA Tech Support <tech@jla.us.com>; Jen Winslow <Jen.winslow@jla.us.com>; Ashley Balsom <ashley.balsom@jla.us.com>; Brandy Steffen <brandy.steffen@jla.us.com>
Subject: Re: Aurora State Airport Master Plan Website Comments - George Buley

Aurora State Airport Master Plan Website Comments

Name	George Buley
Organization	Private Citizen
Comments or questions?	I am George Buley, a private citizen, and an Airport & Airway Trust Fund Taxpayer, and am recommending the following proposals be considered for evaluation in the Aurora State Airport Master Plan Update: Airport Master Plan Advisory Circular 150/5070-6B, effective date 7/29/2005 and Change 2 on 7/27/2015, states: I. Purpose:…"The intent of this AC is to foster a flexible approach to master planning that directs attention and resources to critical

issues to meet future aviation demand."
The FAA has previously demonstrated master planning "flexibility" at the following facilities:
1) Tacoma Narrows Airport. Allowing obstructions to remain in the Runway Safety Area after the Runway Safety Area was expanded.
2) Renton Municipal Airport. Allowing 737s to operate in an Airport Design Group B-II environment via a Letter of Agreement.
3) Caldwell Executive Airport. Allowing the Sponsor to determine which mitigation strategy would be most effective for meeting Runway Object Free Area (ROFA) standards for their proposed runway extension as noted in the Airport Master Plan. I.e., relocating or covering the drainage canal located in ROFA.

Based upon the aforementioned examples of flexibility in Airport Master Planning, it is recommended to evaluate either:
1) The installation of an Engineered Materials Arresting Systems on the entire west side of ROFA or relocate Hubbard Highway roadway 31' west within the 200' Right of Way and install a noise wall for the residents that will be affected on the west side of ROFA.
2) Temporarily halt the Master Plan process and submit a Modification of Standards consistent with the previously approved FAA Airport Layout Plan. The last Airport Master Planning process was completed in 2012, per FAA AC 150/5070-6B, Airport Master Planning.

Please analyze each proposal offered and consider how the community can benefit as the aviation businesses grow to improve the local economy while enabling the self-sustainability of the airport, which is also representative of the growth anticipated in the FAA-approved forecast. It is anticipated that the cost of either one of the proposals is considerably less than the $200M estimated to relocate businesses and jobs away from the local communities they serve, which appears to be an unnecessary, major expense to everyone involved.

Sincerely,

George Buley
Private Citizen, Aviation Trust Fund Taxpayer

Email	georgebuley@yahoo.com
Phone Number	(310) 594-9628

You can edit this submission and view all your submissions easily.

Outlook

Fw: Aurora airport master plan

From Brandy Steffen <brandy.steffen@jla.us.com>
Date Mon 2025-01-06 8:57 AM
To Jen Winslow <Jen.winslow@jla.us.com>; Ashley Balsom <ashley.balsom@jla.us.com>

BRANDY STEFFEN | **JLA PUBLIC INVOLVEMENT**
Senior Program Manager + Partner
She/Her » Why pronouns matter
brandy.steffen@jla.us.com » Office 503-235-5881 » jla.us.com
Meeting + email hours 9 a.m.–5 p.m. Monday–Thursday » Administrative-only hours Friday
Check my availability » Schedule a 30 minute check-in

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Please note: I will be on vacation, without access to my email, starting Friday, 01/24/25 and returning Monday, 02/03/25.

From: THOMAS Alex R <Alex.R.THOMAS@odav.oregon.gov>
Sent: Monday, December 23, 2024 8:42 AM
To: Brandy Steffen <brandy.steffen@jla.us.com>; Samantha Peterson <SPeterson@CenturyWest.com>; BEACH Anthony <Anthony.BEACH@odav.oregon.gov>
Subject: FW: Aurora airport master plan

Hello,

Good morning. Please include within the UAO record.

ALEX THOMAS
OREGON DEPARTMENT OF AVIATION (ODAV)
POLICY, PLANNING, & PROGRAMS MANAGER

CELL 971-375-2357
EMAIL Alex.R.Thomas@ODAV.Oregon.Gov
SALEM, OR 97302
WWW.OREGON.GOV/AVIATION

Schedule a meeting with me.

Schedule a meeting with any of the programs listed below.

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From: Matt Burch <matt.burch@gmail.com>
Date: Sunday, December 22, 2024 at 10:02
To: THOMAS Alex R <Alex.R.THOMAS@odav.oregon.gov>
Subject: Aurora airport master plan

You don't often get email from matt.burch@gmail.com. Learn why this is important

This message was sent from outside the organization. Treat attachments, links and requests with caution. Be conscious of the information you share if you respond.

Dear ODAV c/o Alex Thomas,

As a pilot of aircraft based at KUAO, please register and record my urgent input for the Aurora Airport master plan that is underway to NOT consider the condemnation and destruction of any aircraft hangars.

Thank you,
- Matt Burch

Outlook

Fw: IN OPPOSISTION Current Aurora Airport Master Plan

From Brandy Steffen <brandy.steffen@jla.us.com>
Date Tue 11/19/2024 4:09 PM
To Jen Winslow <Jen.winslow@jla.us.com>; Ashley Balsom <ashley.balsom@jla.us.com>

BRANDY STEFFEN | **JLA PUBLIC INVOLVEMENT**
Partner + Senior Program Manager
brandy.steffen@jla.us.com » Schedule a 30 minute meeting

From: BEACH Anthony <Anthony.BEACH@odav.oregon.gov>
Sent: Friday, November 15, 2024 8:32 AM
To: Brandy Steffen <brandy.steffen@jla.us.com>; Samantha Peterson <SPeterson@CenturyWest.com>
Cc: THOMAS Alex R <Alex.R.THOMAS@odav.oregon.gov>
Subject: FW: IN OPPOSISTION Current Aurora Airport Master Plan

Good morning, please include in the record.

Thank you,

Tony Beach
OREGON DEPARTMENT OF AVIATION
STATE AIRPORTS MANAGER
OFFICE 503-378-2523 **CELL** 503-302-5455
M-F 7:30am – 4pm

From: BEACH Anthony
Sent: Friday, November 15, 2024 8:32 AM
To: Jonathan Buss <jbuss@bussmold.com>
Subject: RE: IN OPPOSISTION Current Aurora Airport Master Plan

Hi Jonathan, thank you for your comments, I have forwarded them to the master plan team and they'll be included in the record.

Tony Beach
OREGON DEPARTMENT OF AVIATION
STATE AIRPORTS MANAGER
OFFICE 503-378-2523 **CELL** 503-302-5455
M-F 7:30am – 4pm

From: Jonathan Buss <jbuss@bussmold.com>
Sent: Thursday, November 14, 2024 11:08 PM
To: BEACH Anthony <Anthony.BEACH@odav.oregon.gov>

Subject: IN OPPOSISTION Current Aurora Airport Master Plan
Importance: High

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This message was sent from outside the organization. Treat attachments, links and requests with caution. Be conscious of the information you share if you respond.

Subject: Objection to Proposed Removal of Privately Owned Hangars

Dear Mr. Beach and Committee Members of the Oregon Department of Aviation regarding the Aurora Airport Master Plan,

I am writing to formally register my strong opposition to the proposed removal of privately owned hangars and properties as part of the ongoing Aurora Airport Master Plan.

As you are aware, there is already a significant shortage of hangars at Aurora Airport. The hangars currently slated for destruction are providing critical services and employment to local businesses and aviation professionals. The proposed "taking" of these properties would not only disrupt the local economy but also exacerbate the existing shortage of hangar space.

I understand that the proposal aims to enhance airport safety and efficiency, but I believe that the justification for the destruction of privately held hangars is insufficient. Specifically, the two key motivations for this proposal—1) relocating a vehicle lane closer to the taxiway, and 2) the creation of a parallel taxi lane—are both questionable.

1. The first motivation, to move a vehicle lane closer to the taxiway, could be achieved more effectively and safely by locating the lane further away from active flight paths and other sensitive areas. The proposed site of the lane, near the hangars, does not appear to be the most strategic or safest location.
2. The second motivation, the construction of a parallel taxi lane, is unnecessary. It is my belief that the same safety and operational benefits could be achieved by acquiring only a small portion of land—perhaps no more than one acre—from a willing seller, rather than displacing entire hangars.

Therefore, while I fully support airport safety improvements, I strongly urge the committee to reconsider any plan that would result in the destruction of privately owned hangars. There are alternatives that would allow for necessary improvements without harming local businesses or further contributing to the hangar shortage.

Thank you for your attention to this matter. I trust that the committee will carefully weigh these concerns as part of the decision-making process.

Sincerely,

Jonathan Buss
[redacted]

Jonathan Buss
President & CEO
Buss Precision Mold, Inc.
13581 SE Ambler Rd | Clackamas, OR 97015
http://www.bussmold.com
503.652.5804 Ext. 11



Outlook

Re: Aurora PAC Meeting 8 follow up

From Brandy Steffen <brandy.steffen@jla.us.com>
Date Mon 2025-01-06 8:56 AM
To Ben Clayton <bclayton@lifeflight.org>
Cc Anthony BEACH <Anthony.BEACH@odav.oregon.gov>; Alex R THOMAS <Alex.R.THOMAS@odav.oregon.gov>; Michael Weimer <MWeimer@lifeflight.org>

Thank you for your message Ben. We appreciate your feedback.

Thank you,
BRANDY STEFFEN | **JLA PUBLIC INVOLVEMENT**
Senior Program Manager + Partner
She/Her » Why pronouns matter
brandy.steffen@jla.us.com » Office 503-235-5881 » jla.us.com
Meeting + email hours 9 a.m.–5 p.m. Monday–Thursday » Administrative-only hours Friday
Check my availability » Schedule a 30 minute check-in

JLA Public Involvement's mission: To create collaborative, meaningful and exceptionally effective public processes that lead to better, more inclusive outcomes.

Please note: I will be on vacation, without access to my email, starting Friday, 01/24/25 and returning Monday, 02/03/25.

From: Ben Clayton <bclayton@lifeflight.org>
Sent: Monday, December 23, 2024 11:14 AM
To: Brandy Steffen <brandy.steffen@jla.us.com>
Cc: Anthony BEACH <Anthony.BEACH@odav.oregon.gov>; Alex R THOMAS <Alex.R.THOMAS@odav.oregon.gov>; Michael Weimer <MWeimer@lifeflight.org>
Subject: RE: Aurora PAC Meeting 8 follow up

Hi Brandy,

Please see attached letter. Obviously, many at the airport are pretty concerned about the proposed solution. For my company, in particular, we are running 24/7/365 life-saving operations from our hangar. Our services are critical to the region. The proposal would cause significant disruption to us beyond the simple economics of the plan. Happy to discuss more at any point.

Ben Clayton | Chief Executive Officer
Office 503.678.4364 | Mobile 503.477.2123 | www.LifeFlight.org
Life Flight Network | 22285 Yellow Gate Lane NE | Suite 102 | Aurora, OR 97002

From: Brandy Steffen <brandy.steffen@jla.us.com>
Sent: Friday, December 20, 2024 5:24 PM
To: Ben Clayton <bclayton@lifeflight.org>
Cc: Anthony BEACH <Anthony.BEACH@odav.oregon.gov>; Alex R THOMAS <Alex.R.THOMAS@odav.oregon.gov>; Michael Weimer <MWeimer@lifeflight.org>
Subject: Re: Aurora PAC Meeting 8 follow up

WARNING: This email originated outside of Life Flight Network's email system.
DO NOT REPLY, OPEN OR CLICK links or attachments unless you recognize the sender and know the content is safe.

Hi Ben,

You can send them to me and I'll get them to the team.

Thanks,

BRANDY STEFFEN | **JLA PUBLIC INVOLVEMENT**
Senior Program Manager + Partner
She/Her » Why pronouns matter
brandy.steffen@jla.us.com » Office 503-235-5881 » jla.us.com
Meeting + email hours 9 a.m.–5 p.m. Monday–Thursday » Administrative-only hours Friday

Check my availability » Schedule a 30 minute check-in » Email is the best way to reach me; I try to respond within 3 full workdays.

JLA Public Involvement's mission: To create collaborative, meaningful and exceptionally effective public processes that lead to better, more inclusive outcomes.

From: Ben Clayton <bclayton@lifeflight.org>
Sent: Friday, December 20, 2024 4:50:46 PM
To: Brandy Steffen <brandy.steffen@jla.us.com>
Cc: Anthony BEACH <Anthony.BEACH@odav.oregon.gov>; Alex R THOMAS <Alex.R.THOMAS@odav.oregon.gov>; Michael Weimer <MWeimer@lifeflight.org>
Subject: Re: Aurora PAC Meeting 8 follow up

Hi Brandy,

Who do we submit the comments to? Thanks.

Ben Clayton | Chief Executive Officer
Office 503.678.4364 | Mobile 503.477.2123 | www.LifeFlight.org
Life Flight Network | 22285 Yellow Gate Lane NE | Suite 102 | Aurora, OR 97002

On Dec 20, 2024, at 16:49, Brandy Steffen <brandy.steffen@jla.us.com> wrote:

WARNING: This email originated outside of Life Flight Network's email system.
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Hello PAC members,

Thank you for those of you who have submitted additional comments about the alternative presented during our last meeting. If you haven't sent a comment over, please do so before the end of the day Monday, December 23.

We have uploaded additional information on the drainfields, as discussed and requested during our last PAC meeting. If you are interested in reviewing this information, please download the files on the project website on the "Meetings" page under PAC Meeting #8.

Thanks,

BRANDY STEFFEN | **JLA PUBLIC INVOLVEMENT**
Senior Program Manager + Partner

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22285 Yellow Gate Lane, Suite 102
Aurora, Oregon 97002
Office (503) 678-4364
Fax (503) 678-4369
www.lifeflight.org

December 23, 2024

Alex Thomas, Planning and Programs Manager
Oregon Department of Aviation
3040 25th Ste SE
Salem, OR 97602
Alex.R.Thomas@odav.oregon.gov

Re: Aurora State Airport Master Plan Proposed Preferred Alternative

Mr. Thomas,

Please enter this letter into the record for the Oregon Department of Aviation's (ODAV) proposed "Preferred Alternative" for the Aurora State Airport Master Plan. We support Director Sugahara's statement that ODAV is willing to modify its Preferred Alternative for the Aurora Airport Master Plan. We believe that it is important that ODAV do so, to enable the airport to continue to deliver significant tax benefits, family wage jobs, emergency resiliency and aeronautical innovation to the region and state. The current version of ODAV's proposed Preferred Alternative is inconsistent with these objectives.

ODAV is bound by ORS 836.640-642 which was developed by Business Oregon. That statute strongly encourages private investment at the Aurora Airport and commands ODAV to carry out that objective. Contrary to that statute, ODAV's proposed alternative contemplates ODAV taking by eminent domain the Aurora Airport front line aircraft hangars for which the owners have invested more than $200 million, created millions in tax revenue, more than a 1000 good jobs and millions in directly and indirectly related tourist revenue for surrounding communities, with ORS 836.640-642 as the catalyst.

Against this backdrop, the "Preferred Alternative" anomalously designates areas that have been set aside in airport master plans for airport related development since 1976, as areas for ODAV acquisition instead of bringing them into the airport boundary established by ORS 836.640-642 for development for airport related uses and wipes out the front-line hangars.

Both elements of the preferred alternative are misguided. Among other objectives for the Aurora Airport, ORS 836.642 requires ODAV to "Preserve investments [at the Aurora Airport] and the level of service provided by [the Aurora Airport]" and to "promote economic development" at Aurora "by creating family wage jobs, increasing local tax bases" through support of private aviation-related uses so that they may "develop and thrive." The preferred alternative is contrary to ORS 836.640-642 and expressly seeks to trade the private investment that the statute seeks to encourage and grow, for government condemnation and ownership.

Concerningly, ODAV's preferred alternative significantly gambles with the significant economic benefits that private investment at the airport has delivered, risking their continuation. The threat of ODAV condemnation, not to mention ODAV actually engaging in such litigation against those

owners, presents an unacceptable risk of driving away not only those aircraft hangar owners, but also their businesses, jobs and related tax and tourist revenue. Once they are gone, the stigma of such ODAV action could make the airport and indeed any airport that ODAV manages, a private investment pariah for decades. Such a risk should not be taken where, as here, a state statute commands ODAV otherwise and there are alternatives.

It is respectfully submitted that the justification for the "preferred alternative" simply does not justify its deleterious effects. ODAV is on record stating that these harmful consequences only flow from ODAV's desire for a "vehicle service road" (VSR) and a new aircraft taxiway. But neither necessitates the preferred alternative.

Regarding the VSR, the 2012 master plan approved a VSR that has none of the Preferred Alternative's deleterious effects and does not carry a $200 million condemnation price tag. At worst, the 2012 VSR costs the state some pavement. Moreover, we are advised that the private aeronautical stakeholder owners have offered ODAV the land needed for the 2012 MP VSR free of charge. We are unaware of any reason for ODAV to not pursue that 2012 MP VSR and we can only see good reasons to do so.

We are further advised that there are alternatives for a new taxiway that ODAV has not explored. We understand that ODAV has not explored any such alternatives because it does not own the land needed for a taxiway to be located elsewhere. However, so far as we know this has never been an impediment previously to the development of the Aurora Airport and should not be an impediment now. Many features of the proposed alternative are now contemplated on land that ODAV does not own – including the taking of the frontline hangars. Even if ODAV had to acquire some private land for a new taxiway, ODAV should explore such alternatives having the least adverse impact on the continuation and growth of private aeronautical investment at the airport, not to mention a price tag well south of the $200 million under the Preferred Alternative. Finally, we are advised that ODAV simply does not "want" to extend the airport boundary to include the land that is now and has long been foreseen for airport-related development in the airport boundary. Such a justification if true, would obviously be contrary to ODAV's mission and responsibility to enable the Aurora Airport to grow with aviation-related uses.

We are frankly perplexed by these problems given the success of the airport and the commands of ORS 836.640-642. ODAV should be eager to develop a master plan that ensures the Aurora Airport's continued growth and success over the master plan's 20-year horizon. If these problems that risk sending the airport backwards by decades arise from a lack of meaningful airport stakeholder engagement in the development of the preferred alternative, then ODAV should meaningfully engage. But whatever the reason, we strongly encourage ODAV to dismiss the Preferred Alternative and to meet with the airport stakeholders and to explore a more normative and economically reasonable preferred alternative that is consistent with ORS 836.640-642.

Sincerely,

Ben Clayton
Chief Executive Officer

Outlook

Re: Aurora State Airport Master Plan Website Comments - Trevor Conroy

From Trevor Conroy <noreply@jotform.com>
Date Wed 6/12/2024 7:02 PM
To JLA Tech Support <tech@jla.us.com>; Jen Winslow <Jen.winslow@jla.us.com>

Aurora State Airport Master Plan Website Comments

Name	Trevor Conroy
Organization	Self
Comments or questions?	We are local residents in Butteville and we totally support the planned growth of the Aurora State airport, adding 500ft to one end of the runway to increase safety margins for larger aircraft and develop the land mid-field with hangars. UAO is a fantastic airport that has so many businesses, employing many locals. I would like to receive email updates.
Email	trevor.conroy@outlook.com
Phone Number	([redacted]

You can edit this submission and view all your submissions easily.

Outlook

Re: Aurora State Airport Master Plan Website Comments - Don Crouch

From Don Crouch <noreply@jotform.com>
Date Fri 6/28/2024 4:00 PM
To JLA Tech Support <tech@jla.us.com>; Jen Winslow <Jen.winslow@jla.us.com>

Aurora State Airport Master Plan Website Comments

Name	Don Crouch
Organization	Sunset Estates Water Board
Comments or questions?	The residents of Sunset Estates are against expansion of the Aurora Airport, are concerns are water, air and noise pollution!!!!Also the Hiways in the area cannot handle more traffic, especially with the conditions the roads and the lack of turning lanes on 551!!!!
If you would like a response, please tell us the best way to contact you:	Email
Email	dwsaurora@icloud.com

You can edit this submission and view all your submissions easily.

Outlook

Fw: Regarding the Aurora Airport master plan that is currently underway.

From Brandy Steffen <brandy.steffen@jla.us.com>
Date Tue 11/19/2024 4:10 PM
To Jen Winslow <Jen.winslow@jla.us.com>; Ashley Balsom <ashley.balsom@jla.us.com>

BRANDY STEFFEN | **JLA PUBLIC INVOLVEMENT**
Partner + Senior Program Manager
brandy.steffen@jla.us.com » Schedule a 30 minute meeting

From: BEACH Anthony <Anthony.BEACH@odav.oregon.gov>
Sent: Thursday, November 14, 2024 2:47 PM
To: Brandy Steffen <brandy.steffen@jla.us.com>; Samantha Peterson <SPeterson@CenturyWest.com>
Cc: THOMAS Alex R <Alex.R.THOMAS@odav.oregon.gov>
Subject: FW: Regarding the Aurora Airport master plan that is currently underway.

Good afternoon, please include in the record.

Thank you,

Tony Beach
OREGON DEPARTMENT OF AVIATION
STATE AIRPORTS MANAGER
OFFICE 503-378-2523 **CELL** 503-302-5455
M-F 7:30am – 4pm

From: BEACH Anthony
Sent: Thursday, November 14, 2024 2:47 PM
To: Zachary Cummings <zachary.a.cummings@gmail.com>; THOMAS Alex R <Alex.R.THOMAS@odav.oregon.gov>
Subject: RE: Regarding the Aurora Airport master plan that is currently underway.

Hi Zacharay, thank you for your comments, I have forwarded them to the master plan team and they'll be included in the record.

Tony Beach
OREGON DEPARTMENT OF AVIATION
STATE AIRPORTS MANAGER
OFFICE 503-378-2523 **CELL** 503-302-5455
M-F 7:30am – 4pm

From: Zachary Cummings <zachary.a.cummings@gmail.com>
Sent: Thursday, November 14, 2024 1:32 PM
To: THOMAS Alex R <Alex.R.THOMAS@odav.oregon.gov>; BEACH Anthony <Anthony.BEACH@odav.oregon.gov>
Subject: Regarding the Aurora Airport master plan that is currently underway.

Some people who received this message don't often get email from zachary.a.cummings@gmail.com. Learn why this is important

This message was sent from outside the organization. Treat attachments, links and requests with caution. Be conscious of the information you share if you respond.

Please register and make part of the master plan record my very strong objection to the "taking" of any privately owned hangars on the Aurora Airport.

There is a significant shortage of hangars. The hangars sited for destruction are all currently providing significant employment. The two motivations for the proposed destruction, 1) a vehicle lane would work MUCH better as far as possible away from the taxiway 2) The parallel taxi-lane is unnecessary, and very similar results could be achieved with ODAV purchasing only 1 acre from a willing seller.

I recommend airport safety improvements but only with no destruction of any hangars.

Thank you,
ZACHARAY AXEL CUMMINGS
11/14/2024

Outlook

Re: Aurora State Airport Master Plan Website Comments - Ted Davis

---

From Brandy Steffen <brandy.steffen@jla.us.com>
Date Tue 11/19/2024 4:10 PM
To trdavis1@comcast.net <trdavis1@comcast.net>

Hello Ted,

Thank you for your comments. We will share this with the technical team.

Thank you,
BRANDY STEFFEN | **JLA PUBLIC INVOLVEMENT**
Partner + Senior Program Manager
brandy.steffen@jla.us.com

From: Ted Davis <noreply@jotform.com>
Sent: Thursday, November 14, 2024 12:21 PM
To: JLA Tech Support <tech@jla.us.com>; Jen Winslow <Jen.winslow@jla.us.com>; Ashley Balsom <ashley.balsom@jla.us.com>; Brandy Steffen <brandy.steffen@jla.us.com>
Subject: Re: Aurora State Airport Master Plan Website Comments - Ted Davis

Aurora State Airport Master Plan Website Comments

Name	Ted Davis
Organization	Hangar Owner and Columbia Aviation Assocation Member
Comments or questions?	There is a significant shortage of hangars. The hangars sited for destruction are all currently providing significant employment and economic revenue. The two motivations for the proposed destruction that are unnecessary and could be better solved by: 1) a vehicle lane would work MUCH better as far as possible away from the taxiway without talking 2) The parallel taxi-lane is unnecessary, and very similar results could be achieved with ODAV purchasing only 1 acre from a willing seller. By unilaterally taking the private hangars would cause long term undue economic harm the hangar owners and businesses that occupy them due to the

	fact that there is NO viable options to relocate at the Aurora Airport due to lack of available hangar space as referenced above. I recommend airport safety improvements but only with no destruction of any hangars. I would like to receive email updates.
If you would like a response, please tell us the best way to contact you:	Email
Email	trdavis1@comcast.net
Phone Number	[redacted]

You can edit this submission and view all your submissions easily.

Outlook

Fw: Opposition to proposed hangar destruction

From Brandy Steffen <brandy.steffen@jla.us.com>
Date Wed 2024-12-18 9:14 AM
To Jen Winslow <Jen.winslow@jla.us.com>; Ashley Balsom <ashley.balsom@jla.us.com>

BRANDY STEFFEN | **JLA PUBLIC INVOLVEMENT**
Senior Program Manager + Partner
She/Her » Why pronouns matter
brandy.steffen@jla.us.com » Office 503-235-5881 » jla.us.com
Meeting + email hours 9 a.m.–5 p.m. Monday–Thursday » Administrative-only hours Friday
Check my availability » Schedule a 30 minute check-in

JLA Public Involvement's mission: To create collaborative, meaningful and exceptionally effective public processes that lead to better, more inclusive outcomes.

I will be on vacation starting Monday, 12/23/24 and will return on Monday, 01/06/25.
JLA will be closed December 24 through January 1 to allow our entire team time to rest and recover. Please get in touch early with any anticipated needs during this time. Wishing you a lovely end to 2024!

From: THOMAS Alex R <Alex.R.THOMAS@odav.oregon.gov>
Sent: Wednesday, December 18, 2024 8:48 AM
To: Brandy Steffen <brandy.steffen@jla.us.com>; Samantha Peterson <SPeterson@CenturyWest.com>; BEACH Anthony <Anthony.BEACH@odav.oregon.gov>
Subject: FW: Opposition to proposed hangar destruction

Hello,

Good morning. Please include within the UAO record.

ALEX THOMAS
OREGON DEPARTMENT OF AVIATION (ODAV)
POLICY, PLANNING, & PROGRAMS MANAGER

CELL 971-375-2357

EMAIL Alex.R.Thomas@ODAV.Oregon.Gov

SALEM, OR 97302

WWW.OREGON.GOV/AVIATION

Schedule a meeting with me.

Schedule a meeting with any of the programs listed below.

Alternative Contacts:

COAR Grants: Grants@ODAV.Oregon.Gov
Procurement / Contracts: Contracts@ODAV.Oregon.Gov
Pavement (PEP/PMP): Pavement@ODAV.Oregon.Gov
Land Use / Tall Structure: LandUse@ODAV.Oregon.Gov

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From: Ted Davis <trdavis1@comcast.net>
Date: Wednesday, December 18, 2024 at 08:45
To: THOMAS Alex R <Alex.R.THOMAS@odav.oregon.gov>
Subject: Opposition to proposed hangar destruction

You don't often get email from trdavis1@comcast.net. Learn why this is important

This message was sent from outside the organization. Treat attachments, links and requests with caution. Be conscious of the information you share if you respond.

Dear ODAV c/o Alex Thomas,

As a pilot that flies off KUAO, please register and record my urgent input for the Aurora Airport Master Plan that is underway not to consider the condemnation and destruction of any aircraft hangars.

Hangars are in very short supply which has driven the prices up dramatically. In addition the owners of the hangars that are proposed to be destroyed have no viable option to relocate on the airport.

There is more than ample access to KUAO via Airport Rd NE for vehicles. There is no need to add an internal roadway.

Thank you,

Ted Davis
T.

Sent from my iPhone

Outlook

Fw: Aurora Airport Master Plan

From Brandy Steffen <brandy.steffen@jla.us.com>
Date Mon 2024-11-11 9:21 AM
To Jen Winslow <Jen.winslow@jla.us.com>; Ashley Balsom <ashley.balsom@jla.us.com>

BRANDY STEFFEN | **JLA PUBLIC INVOLVEMENT**
Partner + Senior Program Manager
brandy.steffen@jla.us.com » Schedule a 30 minute meeting

From: BEACH Anthony <Anthony.BEACH@odav.oregon.gov>
Sent: Friday, November 8, 2024 1:50 PM
To: Brandy Steffen <brandy.steffen@jla.us.com>; Samantha Peterson <SPeterson@CenturyWest.com>
Cc: THOMAS Alex R <Alex.R.THOMAS@odav.oregon.gov>
Subject: FW: Aurora Airport Master Plan

Please include in the record.

Thank you,

Tony Beach
OREGON DEPARTMENT OF AVIATION
STATE AIRPORTS MANAGER
OFFICE 503-378-2523 **CELL** 503-302-5455
M-F 7:30am – 4pm

From: BEACH Anthony
Sent: Friday, November 8, 2024 1:50 PM
To: John Dierks <john.dierks.pilot@gmail.com>; THOMAS Alex R <Alex.R.THOMAS@odav.oregon.gov>
Cc: Bruce Bennett <bruce@auroraaviation.com>
Subject: RE: Aurora Airport Master Plan

Hi John, thank you for your comments, I have forwarded them to the planning team and they'll be included in the record.

Tony Beach
OREGON DEPARTMENT OF AVIATION
STATE AIRPORTS MANAGER
OFFICE 503-378-2523 **CELL** 503-302-5455
M-F 7:30am – 4pm

From: John Dierks <john.dierks.pilot@gmail.com>
Sent: Friday, November 8, 2024 12:25 PM
To: THOMAS Alex R <Alex.R.THOMAS@odav.oregon.gov>; BEACH Anthony <Anthony.BEACH@odav.oregon.gov>
Cc: Bruce Bennett <bruce@auroraaviation.com>
Subject: Aurora Airport Master Plan

Some people who received this message don't often get email from john.dierks.pilot@gmail.com. Learn why this is important

This message was sent from outside the organization. Treat attachments, links and requests with caution. Be conscious of the information you share if you respond.

November 8, 2024

Dear Messrs. Thomas and Beach,

I understand that the Aurora Airport Master Plan currently underway calls for the taking and destruction of certain privately owned hangars on the Aurora Airport. Please register and make part of the Master Plan my very strong objection to such taking of any privately owned hangars on the Aurora Airport. These represent assets to the state's flying public (me) and there is no reason for their removal. The Master Plan should focus on safety improvements but with no destruction of any hangars.

Thank you,

John Dierks, Private Pilot Cert. #3315731
9550

Outlook

Fw: Aurora Airport master plan

From Brandy Steffen <brandy.steffen@jla.us.com>
Date Fri 2024-11-01 12:29 PM
To Ashley Balsom <ashley.balsom@jla.us.com>; Jen Winslow <Jen.winslow@jla.us.com>

1 attachment (86 KB)
New Microsoft Word Document.pdf;

BRANDY STEFFEN | **JLA PUBLIC INVOLVEMENT**
Partner + Senior Program Manager
brandy.steffen@jla.us.com » Schedule a 30 minute meeting

From: THOMAS Alex R <Alex.R.THOMAS@odav.oregon.gov>
Sent: Friday, November 1, 2024 10:06 AM
To: Brandy Steffen <brandy.steffen@jla.us.com>; Samantha Peterson <SPeterson@CenturyWest.com>; BEACH Anthony <Anthony.BEACH@odav.oregon.gov>
Subject: FW: Aurora Airport master plan

Hello Everyone,

Good morning and happy Friday. Please add the attached comment to the UAO Master Plan record.

ALEX THOMAS
OREGON DEPARTMENT OF AVIATION (ODAV)
POLICY, PLANNING, & PROGRAMS MANAGER

CELL 971-375-2357

EMAIL Alex.R.Thomas@ODAV.Oregon.Gov

SALEM, OR 97302

WWW.OREGON.GOV/AVIATION

Schedule a meeting with me.

Schedule a meeting with any of the programs listed below.

Alternative Contacts:
COAR Grants: Grants@ODAV.Oregon.Gov
Procurement / Contracts: Contracts@ODAV.Oregon.Gov
Pavement (PEP/PMP): Pavement@ODAV.Oregon.Gov
Land Use / Tall Structure: LandUse@ODAV.Oregon.Gov

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From: Dallas Enger <dallas_enger@msn.com>
Date: Friday, November 1, 2024 at 09:39
To: THOMAS Alex R <Alex.R.THOMAS@odav.oregon.gov>
Subject: Aurora Airport master plan

This message was sent from outside the organization. Treat attachments, links and requests with caution. Be conscious of the information you share if you respond.

Dallas Enger

In response to the Aurora Airport master plan that is currently underway, please register and make part of the master plan record **my extraordinarily strong objection to the "taking" of any privately owned hangars at the Aurora Airport.** I recommend airport safety improvements but only with no destruction of any hangars.

Dallas H. Enger 541-936-0284

RE: Aron Faegre Submission to ODAV and JLA - Input for Aurora State Airport Master Plan

BEACH Anthony <Anthony.BEACH@odav.oregon.gov>

Tue 9/3/2024 6:12 AM

To:faegre <faegre@earthlink.net>;THOMAS Alex R <Alex.R.THOMAS@odav.oregon.gov>;Brandy Steffen <brandy.steffen@jla.us.com>

Thanks Aron.

Hope you had a great holiday weekend,

Tony Beach
OREGON DEPARTMENT OF AVIATION
STATE AIRPORTS MANAGER
OFFICE 503-378-2523 **CELL** 503-302-5455
M-F 7:30am – 4pm

From: faegre <faegre@earthlink.net>
Sent: Tuesday, September 3, 2024 6:11 AM
To: BEACH Anthony <Anthony.BEACH@odav.oregon.gov>; THOMAS Alex R <Alex.R.THOMAS@odav.oregon.gov>; brandy.steffen@jla.us.com
Cc: faegre@earthlink.net
Subject: RE: Aron Faegre Submission to ODAV and JLA - Input for Aurora State Airport Master Plan

This message was sent from outside the organization. Treat attachments, links and requests with caution. Be conscious of the information you share if you respond.

Tony

This is a personal response from me.

Aron

Sent from my Verizon, Samsung Galaxy smartphone

-------- Original message --------
From: BEACH Anthony <Anthony.BEACH@odav.oregon.gov>
Date: 9/3/24 9:08 AM (GMT-05:00)
To: faegre@earthlink.net, THOMAS Alex R <Alex.R.THOMAS@odav.oregon.gov>, brandy.steffen@jla.us.com
Subject: RE: Aron Faegre Submission to ODAV and JLA - Input for Aurora State Airport Master Plan

Hi Aron, I have forwarded this to the planning team.

Are you submitting this as the Alternate for AABC/TLM Holdings? Each Organization on the PAC is allowed 1 response.

Thank you,

Tony Beach
OREGON DEPARTMENT OF AVIATION
STATE AIRPORTS MANAGER
OFFICE 503-378-2523 **CELL** 503-302-5455
M-F 7:30am – 4pm

From: faegre@earthlink.net <faegre@earthlink.net>
Sent: Tuesday, September 3, 2024 5:18 AM
To: THOMAS Alex R <Alex.R.THOMAS@odav.oregon.gov>; BEACH Anthony <Anthony.BEACH@odav.oregon.gov>; brandy.steffen@jla.us.com
Subject: Aron Faegre Submission to ODAV and JLA - Input for Aurora State Airport Master Plan

This message was sent from outside the organization. Treat attachments, links and requests with caution. Be conscious of the information you share if you respond.

Via Electronic Mail

Alex Thomas Alex.R.Thomas@odav.oregon.gov
Planning and Programs Manager
Tony Beach Anthony.BEACH@odav.oregon.gov
State Airports Manager
Oregon Department of Aviation

Brandy Steffen brandy.steffen@jla.us.com
JLA Public Involvement

Dear Alex, Tony, and Brandy:

Attached is a document which can be used to formally gain a modification of standards for the ROFA on the west side of the airport, where Highway 551 and the Airport Perimeter Fence force a reduced separation from the runway centerline.

I have taken the time to create this detailed risk analysis for ODAV, because under FAA's rules and standards this kind of modification of standards is allowed, and in this particular case the analysis fully demonstrates that the non-standard existing conditions result in an acceptable level of safety, as required by Order 5300.1G.

Equally important, this eliminates the hundreds of millions of dollars of public funds needed to move Highway 551, or to move the runway, taxiway, and tower – funds which are sorely needed for other much needed airport improvements that

can significantly improve safety – at Aurora and at other airports. Use of the modification of standards also saves hundreds of jobs at the airport that under several of the preliminary schemes would be disrupted and likely terminated.

This approach provides a win-win for all parties; I look forward to meeting with you and working cooperatively with ODAV to proceed in this direction.

Respectfully,

Aron Faegre

cc: Kenji Sugahara Kenji.SUGAHARA@odav.oregon.gov

Aron Faegre, AIA, PE
Aron Faegre Airport Planning & Design
13200 Fielding Road
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Aurora State Airport (UAO)
Proposed Modification of
Runway Object Free Area (ROFA) Design Standards

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This memorandum provides an analysis and methodology by which a Modifications of FAA Airport Design Standards (MOS) at the Aurora State Airport (UAO), for the Runway Object Free Area (ROFA) can be justified as:

> "… resulting in an acceptable level of safety, useful life, lower costs, greater efficiency, or the need to accommodate an unusual local condition on a specific project through approval on a case-by-case basis." - FAA Order 5300.1G, page 1.

as defined and permitted under FAA Order 5300.1G Modifications to Agency Airport Design, Construction, and Equipment Standards[1].

1. BACKGROUND

The Aurora State Airport is surrounded by farm lands, near Aurora, Oregon, at the northern end of Marion County. It primarily serves aviation businesses involved with:

- emergency medical transport[2],
- aviation heavy-lift helicopter fire-fighting and power line construction companies (for which fixed wing aircraft are essential for support),[3]
- business jets for numerous major national corporations based within 10 miles,
- aircraft manufacturing for the S-LSA (Special Light-Sport Aircraft) and kit-build

[1] FAA Order 5300.1G Appendix A specifically gives FAA Office of Airport (ARP) and Region the authority to issue a MOS for Runway Object Free Areas. The Order can be downloaded at: https://www.faa.gov/documentLibrary/media/Order/order-5300-1G-modifications-to-standards.pdf .
[2] Regional headquarters for Life Flight Network, with bases all over Oregon, Washington, Idaho, Montana, and Nevada.
[3] Columbia Helicopters, Helicopter Transport Services, Wilson Construction, companies that work internationally with headquarters at Aurora Airport. The use of the Aurora Airport runway is essential to these companies for rapid providing of crews, equipment, and repairs to helicopters in active service of fighting fires, moving power lines, or doing rescue, relief, or humanitarian work.

industry[4], and

- other general aviation aircraft using the airfield for business, pilot training, and recreational flying.

There is no scheduled air service using the airport. The State of Oregon Department of Aviation (ODAV) owns, governs, and manages the public lands of the airport. Most of the business aircraft based at the airport access the runway via through-the-fence permits with ODAV.

Flights by based business jets, such as a Challenger 300, dictate that the Airport Reference Code is C-II. Due to the geometry of the existing site, the airport does not meet current FAA design standards for the ROFA, due primarily to adjacent Highway 551 to the west of the runway.

Most recently ODAV's planned solution[5] to meeting these standards ("Refined Preliminary Alternatives Summary", by Century West Engineering, dated July 31, 2024) is one of only two options:

- relocate the highway further west, (which involves acquiring both private residential and commercial properties further west), or
- relocate the runway, taxiway, and control tower east (which involves acquiring many acres of existing private property already developed with hangars, taxilanes, and aprons for aviation uses) and demolishing numerous large 40,000 square foot aviation hangars along the taxiway.

Both options have very high financial and environmental costs (probably in the greater than $100 million range), which would make them difficult to ever be implemented. If this master plan is approved as currently planned, and one of these options were not implemented, then ODAV and FAA have reported that the airport would only receive maintenance funding and no additional safety improvement funds. This would result in the airport not keeping pace with the aviation industry standards of safety. The second option (moving the runway, control tower, and demolishing hangars), If implemented, would in addition force closure of many of the major medical transport and fire-fighting facilities on the airport, and would put many of the airport's 1,500 employees out of jobs.

It is noted that in the 2012 Airport Layout Plan (ALP), approved (signed) by both ODAV and FAA, the airport also had the same Runway Design Code (RDC) status of C-II and

[4] Van's Aircraft www.vansaircraft.com the international leader in S-LSA produced aircraft.
[5] Refined Preliminary Alternatives Summary document dated July 31, 2024 by Century West Engineer can be downloaded at: https://publicproject.net/files/UAOAMP/uao-refined-preliminary-alternatives-summary-1-.pdf?d952c4adef .

listed a MOS as the solution to the non-standard ROFA limitation on the west property line. At that time there was consensus between ODAV and FAA that a MOS was a reasonable solution.

This memorandum provides the evidence to show that the 2012 ALP was a good approach to resolution of the ROFA, and that it can reasonably be continued. This report demonstrates that there is an acceptable level of safety through modifying the ROFA standard for the specific deviation to standards located on the west side of the runway.

FAA standards for different airports ROFA's vary from 250 foot width, to an 800 foot width, depending on aircraft type using the airport. As will be shown below, the primary reason justifying the modification is that the going from B-II to C-II category is just where the 500-foot required ROFA width changes to an 800-foot wide required ROFA - yet this is the same width required for all RDC category aircraft all the way to E-VI -Portland International Airport, San Francisco Airport, and every other international airport in the country. UAO will never have the larger size of aircraft those airports accommodate – Boeing 737's to Boeing 777's – so a slight reduction in width on the west side provides a level of safety appropriate for UAO, which will always serve only much smaller aircraft.

Modifications of standards for ROFA's are common at even large national airports. For example, recently several MOS were adopted at San Jose International Airport for deficiencies in the ROFA, as well as for runway-taxiway separations, and for runway object free areas[6]. It even appears that Portland International Airport (PDX) may have their airport perimeter fence, the shoulder of NE Marine Drive, and improper grading within the 400-feet area from runway centerline, at the northeast corner of the ROFA for Runway 10L.

This memorandum provides the detailed technical background and mathematically calculated justification, needed for the FAA and ODAV to again approve a MOS for the ROFA at Aurora State Airport.

2. MOS PROCESS

The process for gaining a modification of standards is provided in FAA AC 150/5300-13B Airport Design[7] in Section 2.8. It states, and we provide commentary after each paragraph as to acceptability:

[6] Norman Y. Mineta San Jose International Airport Runway Incursion Mitigation/Airfield Design Standards Analysis, November 27, 2017. Justification for ROFA modifications in this document were often simply the practical and cost issues of modifying major adjacent highways, similar to what is at issue in a much smaller Aurora Airport.
[7] FAA AC 150/5300-13B Airport Design Available free on line at:
https://www.faa.gov/documentLibrary/media/Advisory_Circular/AC-150-5300-13B-Airport-Design-Chg1.pdf

2.8 ***Modification of Standards.***

Site-specific conditions may make it impractical to meet all FAA design standards at an airport. The FAA considers, on a case-by-case basis, modifications to design standards that result in an acceptable level of safety and efficiency. Specific operational controls may be necessary to establish an acceptable level of safety for operation of aircraft at the airport. FAA Order 5300.1 establishes FAA policy for administering airport requests for modification of standards. See paragraphs 2.4 and 2.5.

This memorandum provides this information and finds that no specific operational controls are necessary, see comments on paragraph 2.4 below.

2.8.1 The FAA views an approved modification of standards as an interim measure intended to mitigate unique site-specific conditions. Unless the FAA explicitly states otherwise in the approval action, the FAA expects airports with approved modifications to pursue ways to meet design standards. This may occur incrementally over time or at such time it becomes practical to correct the non-standard condition.

The FAA and ODAV can work with Oregon Department of Transportation on master planning future revisions to State Highway 551 so that it can be corrected "at such time it becomes practical." Also, there are potential options where ODAV and ODOT could jointly agree to relocate the airport perimeter fence closer to Highway 551, which could be an "incrementally" established improvement.

2.8.2 The FAA will not consider any request to modify design standards associated with the following:

- *RSA dimensions*
- *OFZ dimensions*
- *Approach or departure surface dimensions*
- *Standards established within a regulation (e.g., stopway, clearway).*

The ROFA is not one of these.

2.8.3 An airport seeking FAA approval of modification to a design standard submits a request using the Modification of Standards application tool within the Airport Data and Information Portal (ADIP) at https://adip.faa.gov. The FAA relies on the following information, in part, to determine the acceptability of a modification to FAA design standards:

- *Information on the standard proposed for modification.*
- *Description of proposed modification and why the airport cannot meet standards.*
- *Statement addressing how modification will provide an acceptable level of safety, economy, durability, and workmanship.*
- *Listing of any special operational measures necessary to accommodate the modification.*

This document was prepared to provide the analysis needed for ODAV to submittal for the MOS per Section 2.4.

2.4 Addressing Non-standard Airport Conditions.

> *The FAA expects airport owners to address non-standard conditions through the airport planning process. The FAA acknowledges that conformance to current standards is not always practical. However, the FAA expects airports to continue to investigate mitigation measures, whether in one or multiple phases, and correct the non-standard conditions over time.*

It is important to re-emphasize the above statement, that the FAA here "acknowledges that conformance to current standards is not always practical." Further, per this paragraph, the current master planning activity is the appropriate place for this analysis and the formal establishment of a MOS for the ROFA. This report and analysis identifies intermediate steps that can be taken, such as relocating the airport perimeter fence, that will iteratively move the airport closer to compliance.

This analysis utilizes an FAA established safety analysis methodology to show that the MOS provides an acceptable level of safety. The study found no special measures needed to accommodate the modification.

3. METHODOLOGY

In 2011, the Transportation Research Board (TRB) released Airport Cooperative Research Program (ACRP) Report #51 – Risk Assessment Method to Support Modifications of Airfield Separation Standards. The ACRP is funded by the Federal Aviation Administration (FAA). Report #51 is used to support the ROFA MOS requested at Aurora State Airport.

The proposed ROFA MOS is modeled in this report in accordance with Appendix A – Risk Assessment Methodology of ACRP Report #51[8].

This report uses risk plots, along with the annual number of operations, to analyze the cumulative risks associated with Runway to Object Separations. The operations numbers at UAO are taken from the current draft Master Plan, and are numbers already approved by the FAA in a letter[9] to ODAV dated November 15, 2023 (corrected January 23, 2024). For sake of a conservative analysis, we are using the most distant forecast projects for the year 2041, which are:

- 90,231 total operations all RDC categories, of which
- 862 operations are of RDC C-II and D aircraft

[8] ACRP Report #51 – Risk Assessment Method to Support Modifications of Airfield Separation Standards is available free on line at: https://nap.nationalacademies.org/catalog/14501/risk-assessment-method-to-support-modification-of-airfield-separation-standards

[9] Federal Aviation Administration (FAA) Aurora (UAO Aviation Activity Forecast Approval Airport Improvement Program Grant Number 3-41-0004-022-2021 available at: https://publicproject.net/files/2024-01/Aurora-Airport/uao-forecast-approval-20231115-corrected-20240123.pdf?57af6c19b7

For operations involving the runway, per the methods of Report #51, the risk is analyzed based on three distinct phases of flight:

a. Landing - Airborne Phase
b. Landing - Ground Phase
c. Takeoff

The separation distance from the runway centerline to an object is used with the associated risk plot to calculate the risk of collision per operation.

The risk of collisions per operation is then analyzed along with the number of annual airport operations for the appropriate phase of flight to determine the predicted frequency of occurrence. The frequency of occurrence is used to determine the FAA likelihood level using Table A-3 from ACRP Report #51 which is shown below:

Table A-3. FAA likelihood levels (FAA, 2010).

	General	Airport Specific	ATC Operational	
			Per Facility	NAS-wide
Frequent A	Probability of occurrence per operation is equal to or greater than 1×10^{-3}	Expected to occur more than once per week or every 2,500 departures (4×10^{-4}), whichever occurs sooner	Expected to occur more than once per week	Expected to occur every 1–2 days
Probable B	Probability of occurrence per operation is less than 1×10^{-3}, but equal to or greater than 1×10^{-5}	Expected to occur about once every month or 250,000 departures (4×10^{-6}), whichever occurs sooner	Expected to occur about once every month	Expected to occur several times per month
Remote C	Probability of occurrence per operation is less than 1×10^{-5} but equal to or greater than 1×10^{-7}	Expected to occur about once every year or 2.5 million departures (4×10^{-7}), whichever occurs sooner	Expected to occur about once every 1–10 years	Expected to occur about once every few months
Extremely Remote D	Probability of occurrence per operation is less than 1×10^{-7} but equal to or greater than 1×10^{-9}	Expected to occur once every 10–100 years or 25 million departures (4×10^{-8}), whichever occurs sooner	Expected to occur about once every 10–100 years	Expected to occur about once every 3 years
Extremely Improbable E	Probability of occurrence per operation is less than 1×10^{-9}	Expected to occur less than once every 100 years	Expected to occur less than once every 100 years	Expected to occur less than once every 30 years

Note: Occurrence is defined per movement.

Source: ACRP Report #51

The key takeaway from Table A-3 is that for a specific airport, if the likelihood of incidence is less than once every 100 years it is considered a “Extremely Improbable” Class E occurrence.

A Hazard Severity Classification is then assigned based on the worst credible outcome of an incident. Since the ACRP method is based on wingtip separation, the report states that: “From the point of view of risk and based on the records of incidents and accidents,

the worst credible consequence expected for wingtip collisions of two taxiing aircraft is aircraft damage" (ACRP Report #51 page 19). A similar aircraft damage expectation would be a wingtip collision with the airport perimeter fence, which is the ROFA limitation examined in this report.

The Hazard Severity Classifications were determined in accordance with Table A-4 FAA Severity Definitions from ACRP Report #51 and are shown below:

Table A-4. FAA severity definitions (FAA, 2010).

Hazard Severity Classification				
Minimal 5	**Minor 4**	**Major 3**	**Hazardous 2**	**Catastrophic 1**
No damage to aircraft but minimal injury or discomfort of little consequence to passenger(s) or workers	- Minimal damage to aircraft; - Minor injury to passengers; - Minimal unplanned airport operations limitations (i.e. taxiway closure); - Minor incident involving the use of airport emergency procedures	- Major damage to aircraft and/or minor injury to passenger(s)/ worker(s); - Major unplanned disruption to airport operations; - Serious incident; - Deduction on the airport's ability to deal with adverse conditions	- Severe damage to aircraft and/or serious injury to passenger(s)/ worker(s); - Complete unplanned airport closure; - Major unplanned operations limitations (i.e. runway closure); - Major airport damage to equipment and facilities	- Complete loss of aircraft and/or facilities or fatal injury in passenger(s)/ worker(s); - Complete unplanned airport closure and destruction of critical facilities; - Airport facilities and equipment destroyed

Source: ACRP Report #51

Then, using both the FAA likelihood level and the Hazard Severity Classification the risk is then analyzed using Figure A-1 FAA Risk Matrix from ACRP Report #51, shown below:

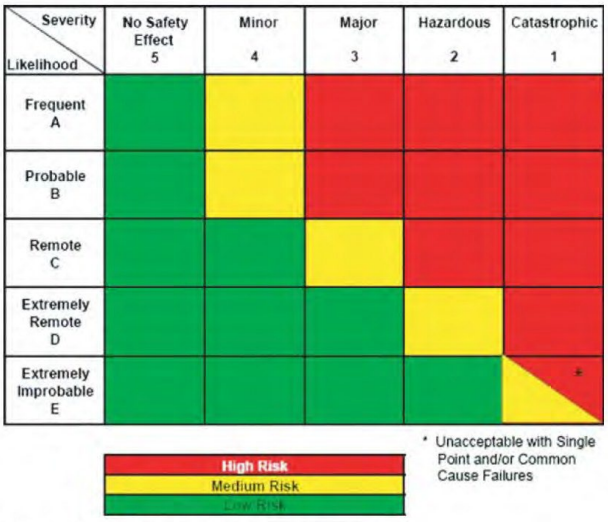


Figure A-1. FAA risk matrix (FAA, 2010).

Source: ACRP Report #51

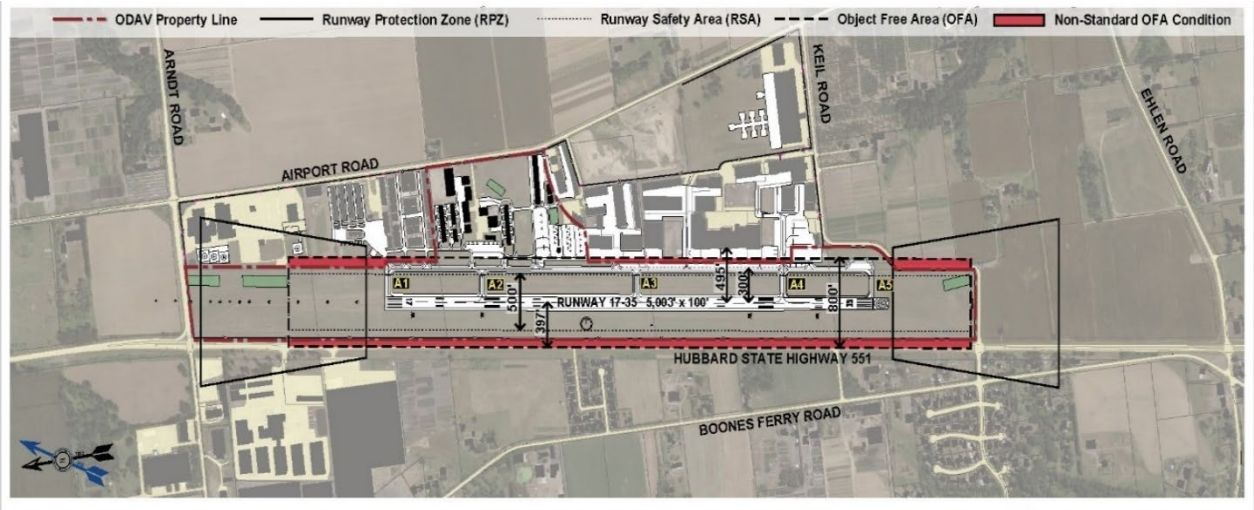
Based on Figure A-1 if the incident is Extremely Improbably (i.e. more than 100 years probability) the risk is considered “Low,” except for an incident considered catastrophic. We will use these graphs to evaluate the results from the detailed risk analysis of UAO below.

4. UAO ANALYSIS

In 2012 Master Plan and ALP established the UAO runway RDC, given existing based aircraft, as C-II, up from a B-II. The required ROFA width of a B-II runway is 500 feet centered on the runway. As it turns out, any runway of higher RDC than a B-II requires 800 feet in width. Thus, the UAO required C-II ROFA width is 800 feet centered on the runway. This 800-foot width is the standard used for aircraft ranging from a Challenger 300 business jet to the largest Boeing 777 or even the largest military aircraft. The 2012 approved ALP lists the ROFA deviation as a modification to standards, since the airport perimeter fence and Highway 551 were within the ROFA.

The UAO forecast of operations predicts that by the year 2041 there will be 90,230 annual operations at the airport, of which 862 would be an RDC above the B-II category. Thus, the 89,368 operations by B-II or lesser category clearly are operating well within ROFA safety standards, as the existing runway to road separations provide more than the 500-foot required width. It is just the 862 operations that need to be analyzed for ROFA safety relative to the required 800-foot width.

The deficiencies in the existing Runway OFA at UAO are shown in the Figure below:



UAO Figure A: Highway 551 Shown as ROFA Deviation Object
Source: Century West Engineers, Aurora State Airport Draft Airport Master Plan, Working Paper No. 1, Figure 2-15, November 2023 (Updated)

The current ROFA object deficiencies are:

d. Hubbard State Highway 551 for which the OFA penetrates 3 feet beyond the highway centerline. (368' to 377' clear width available from outer edge of highway gravel shoulder to Runway CL)
e. Perimeter Fence Inside OFA (312' clear width from Runway CL)

Potentially the airport fence could be relocated to the east edge of the 12-foot-wide gravel shoulder, since both the highway and the airport are owned by the State of Oregon. There can be an agreement between ODOT and ODAV to allow this. Relocating the fence in this way would result in a minimum width of the ROFA on the west side of the runway, to a 368-foot clearance - which would be only 32 feet out of conformance.

However, we will evaluate the ROFA for the existing conditions, and thus use the location of the airport perimeter fence as the maximum ROFA available at this time.

When analyzing the risk associated with a reduction in Runway OFA it is important to consider the purpose of the design standard. Paragraph 3.12 of Advisory Circular 150/5300-13B defines the ROFA but does not give detailed design rational behind the standard:

> *"ROFA is a clear area limited to equipment necessary for air and ground navigation, and provides wingtip protection in the event of an aircraft excursion from the runway"*

Appendix I, Paragraph I.8 of Advisory Circular 150/5300-13B provides the only available reference to the design rationale behind the Runway OFA width:

> *"The ROFA serves two principal purposes: 1. Development buffer in proximity to a runway, and 2. Wing clearance for a runway excursion event to the outer limit of the RSA. `*

Appendix I, in Section I.8.2, also clarifies that part of the "development buffer" intent is:

> *"Protection of the ROFA also reserves space for future development of a parallel taxiway that permits proper alignment of aircraft at a holding position on an entrance taxiway."*

However, for the given physical layout of UAO there can be no plan for a parallel taxiway on the west side of the runway, because of the location of Highway 551 and that there never can be hangars or other aviation uses on that side of the runway. Therefore, that leaves the only ROFA purpose for UAO as only "wingtip clearance for a runway excursion" which is precisely what this analysis provides.

Below we will analyze resolving the ROFA utilizing the risk analysis method of ACRP Report #51, for the case:

- No Change to existing ROFA conditions on West Side of Runway (Hwy 551 and Airport Perimeter Fence remain as existing) resulting in a 312-foot clearance to runway CL.

Per the methodology of ACRP Report 51, we analyze the risks for each of the takeoff and landing scenarios. For landing operations, the analysis is further divided into two parts: airborne (approach) phase and ground (landing rollout) phase. However, because the risk of veering off the runway during takeoff is so much less than for during landing, the methodology indicates that usually it is not necessary to evaluate takeoff option except if there are runways that only are used for takeoffs and not for landings. We will do that takeoff evaluation in any case, just to clearly determine what it is in the UAO context.

Since the existing runway to taxiway separation meets the current criteria for a C-II airport, for this study that analysis would seem unnecessary. However, we will include that option in this report because it provides a baseline of safety that the AC 150-5300-13B Airport Design Standards have determined is an acceptable and appropriate level of safety for a C-II airport.

Thus, for this UAO ROFA analysis separate risks are developed for each of:

1. Airborne Phase (Landing) is for instrument approaches which terminate the approach as a missed approach, and the risk is hitting another object such as hitting the airport perimeter fence or a vehicle on Highway 551 (using ACRP Report 51 Fig. 31); “the airborne risk is computed only for missed approaches” (ACRP Report 51, page 21).
2. Ground Phase (Landing Rollout) where risk is veering off the runway into the reduced width ROFA and hitting the fence or a car on Highway 551 (using ACRP Report 51 Fig 42). Figure 42 is based on the assumption that the risk is between the two wingtips of two aircraft, one aircraft on the edge of the runway and the other at the centerline of a taxiway. The ACRP makes clear that the x-axis distance on the Risk Figures are centerline of runway to centerline of taxiway because the risk is assumed aircraft to aircraft. However, the predicted risk is based on the wingtip-to-wingtip distance. When using the Risk Figures for objects (not aircraft) like a fence or road (which has no wings), half of the wingspan should be added to the distance to compensate for the wingtip-to-wingtip assumption. Thus, per Group II standards, the clearance distance used for Figure 42 should add half of 79 feet (equals 39.5 feet) of additional clearance, which would create a total of 351 feet to use in Fig. 42. The risk shown with the 312 feet and the 351 feet are each shown in figures.

3. Ground Phase (Takeoff) where risk is veering off the runway into the reduced width ROFA and hitting the fence or a car on Highway 551 (using ACRP Report 51 Fig 49).

Finally, to have more relevant data, we will also perform the risk analysis of the standard required 300-foot separation between runway centerline and taxiway centerline for a landing, which is the level of safety the AC 150/5300-13B sets for in a C-II airport:

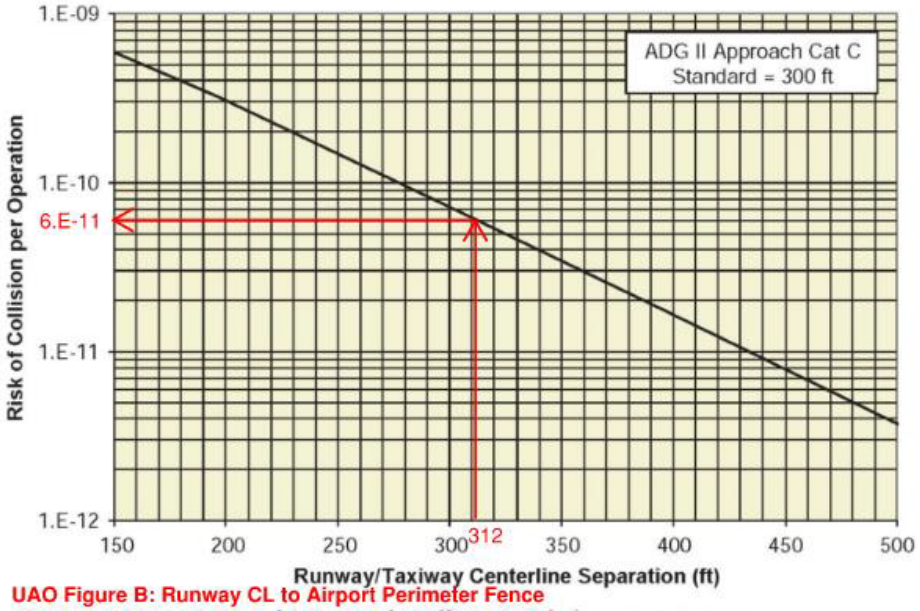
4. Ground Phase (Landing Rollout) where risk is veering off the runway into the taxiway (using ACRP Report 51 Fig 42).

This data will give us an example of an acceptable level of safety utilized in AC 150/5300-13B for a C-II airport.

5. Specific Analysis: Proposed MOS Option - No Change to Existing ROFA Conditions (312' Separation from Runway Centerline to Airport Fence)

The Perimeter Fence at the west side is located 312 feet from the runway centerline. The risks associated with leaving it there as a modification of standards, for each of the phases of flight are analyzed below:

1. Airborne Landing Phase Risk from Reduced ROFA – For a very conservative analysis we will assume that this includes all approach to landings, not just missed approaches. Using the separation of 312' and Figure AA-33 in Appendix A of ACRP Report #51, the following provides a risk level 6.0E-11 of occurrence per landing (which as an inverse, is one chance in a 16.7 trillion landings) that an aircraft gets 312' from the runway centerline. This can be seen in the figure below:

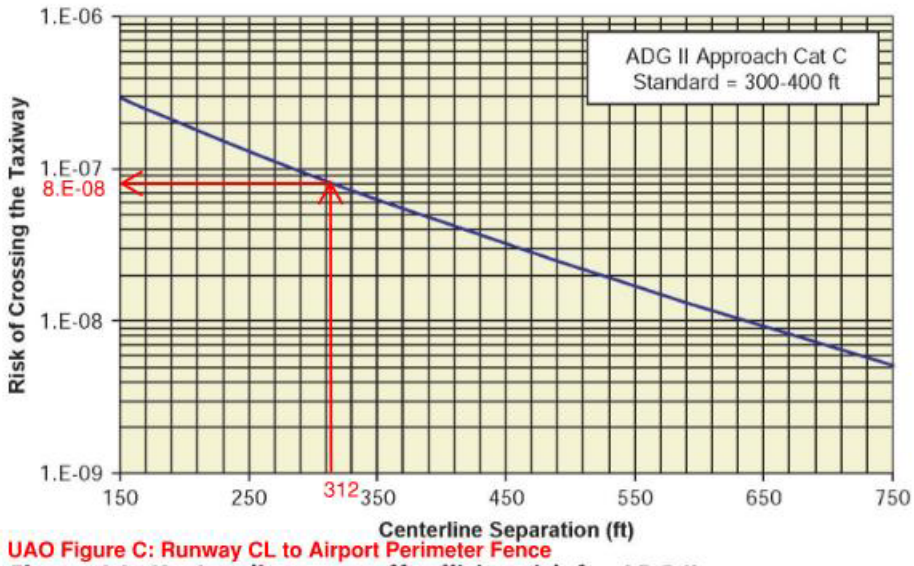


UAO Figure B: Runway CL to Airport Perimeter Fence

Figure AA-31. Missed approach collision risk for ADG II Cat I.

The current annual number of landing operations at UAO is approximately 45,115 or half of the 90,230 annual operations. As the risk is one incident in every 16.7 trillion landings, the time between occurrences is calculated as 16 trillion landings divided by 45,115 landing operations per year which equates to one incident every 369,000 years. Thus, this risk is of no significance.

2. Landing Roll Phase Risk for Reduced ROFA - Using the separation of 312' and Figure AA-43 in Appendix A of ACRP Report #51, provides a risk level 8.0E-08 or in the inverse: one chance in 12.5 million landings. This can be seen in the figure below:



UAO Figure C: Runway CL to Airport Perimeter Fence

Figure AA-42. Landing veer-off collision risk for ADG II.

As the risk is one incident in every 12.5 million landings, the rate of occurrence is calculated as 12.5 million landings divided by 45,115 landings per year which equates to one incident every 277 years.

Using the ACRP described adjustment when the object is not another aircraft and half the C-II wingspan can be added to the clearance distance, results in a separation of 351' and Figure AA-43 in Appendix A of ACRP Report #51, provides a risk level 6.0E-08 or one chance in 16.7 million landings. This can be seen in the figure below:

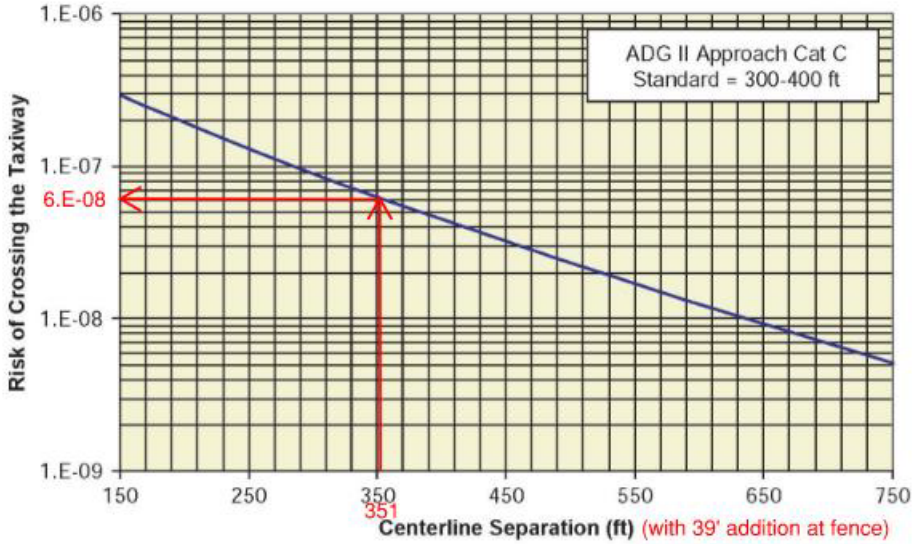
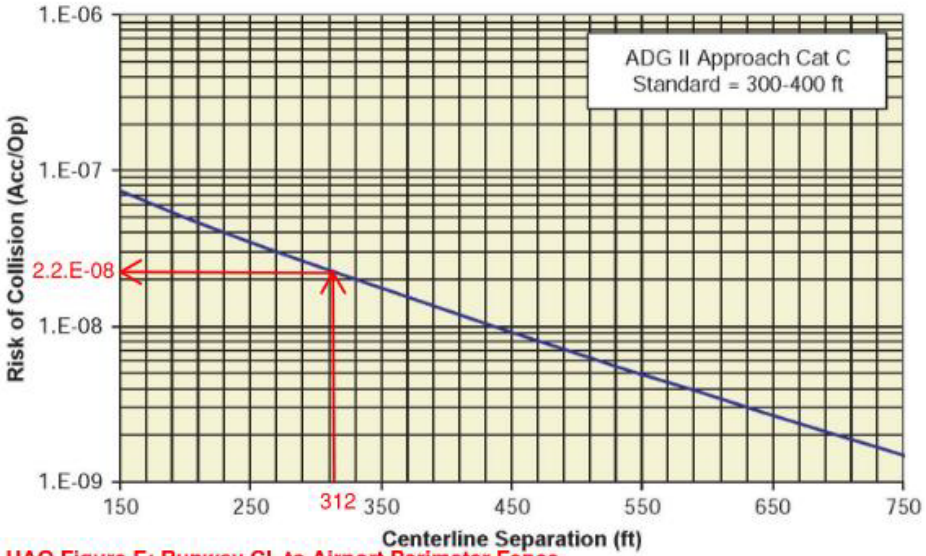


Figure AA-42. Landing veer-off collision risk for ADG II.
UAO Figure D: Runway CL to Airport Perimeter Fence Including Wingspan adjustment

As the risk is one incident in every 16.7 million landings, the rate of occurrence is calculated as 16.7 million landings divided by 45,115 landings per year which equates to one incident every 369 years.

3. Takeoff Roll Phase Risk for Reduced ROFA - Using the separation of 312' and Figure AA-49 in Appendix A of ACRP Report #51, provides a risk level 2.2E-08) or one chance in 45.5 million takeoffs. This can be seen in the figure below:

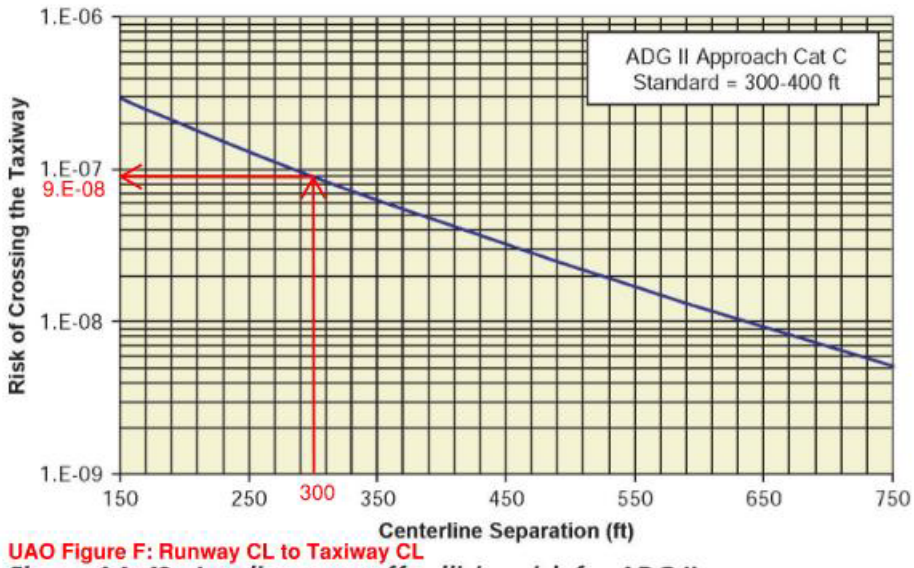


UAO Figure E: Runway CL to Airport Perimeter Fence
Figure AA-49. Takeoff veer-off collision risk for ADG II.

As the risk is one incident in every 45.5 million takeoffs, the rate of occurrence is calculated as 45.5 million takeoffs divided by 45,115 takeoffs per year which equates to one incident every 1,008) years.

Finally, as a test of the level of safety that AC 150/5300-13B considers acceptable we check what the predicted risk level is of the existing runway-taxiway separation considered appropriate[10] by FAA.

4. Landing Roll Phase Risk to Taxiway Consistent with Safety Standards of AC 150/5300-13B - Using the separation of 300' and Figure AA-43 in Appendix A of ACRP Report #51, provides a risk level 9.0E-08 or one chance in 11.1 million landings. This can be seen in the figure below:



UAO Figure F: Runway CL to Taxiway CL

Figure AA-42. Landing veer-off collision risk for ADG II.

As the risk is one incident in every 11.1 million landings, the rate of occurrence is calculated as 11.1 million landings divided by 45,115 landings per year which equates to one incident every 246 years.

[10] Note that Section 3-24 of Order 5100.38D Change 1 states that the FAA will not fund airport safety greater than that in the Airport Design standards, so the standard set by the runway-taxiway separation is a significant number. Order 5100.38D Change 1 can be downloaded for free at: https://www.faa.gov/documentLibrary/media/Order/AIP-Handbook-Order-5100-38D-Chg1.pdf

6. Conclusions

Considering the risk of each phase of flight, the risk of collision during the landing roll is the controlling factor. The Hazard Severity Classification for this type of operation would be major and the acceptable probability of occurrence is remote (1E-05) or less than once every 1-10 years. The following table summarizes the risk associated with each phase of flight:

Phase of Flight	Rate of Occurrence	Acceptable Level
Airborne Phase	Once every 369,000 years	Yes
Landing Roll Phase	Once every 277 years (or 369 years with calculation adjustment for fence object in lieu of wing object)	Yes
Takeoff Roll Phase	Once every 1,000 years	Yes

A runway to object separation of 312’ provides an acceptable level of safety as the controlling occurrence is once every 277 years (or 369 years with the adjustment for wingspan at the fence as allowed in the ACRP method). This is much less risk than the once per 100 years FAA standard shown in Table A-3 and results in a Category E “Extremely Improbable” occurrence. Further, per ACRP’s method, a wingtip to fence occurrence is considered by ACRP’s method to be a Table A-4 Minimal Severity occurrence. This combination via Figure A-1 concludes that the outcome as Low Risk.

Figure UAO F shows that the existing risk of occurrence between the existing runway and existing taxiway, which fully meets FAA standards, is one in every 246 years. This means that the risk to an occurrence at the taxiway, is much less (i.e. longer duration between events) than the FAA’s 100-year standard. The risk of collision with the perimeter fence is then even much less than that of a taxiway collision.

Finally, there is an incremental improvement option of ODAV and ODOT coming to an agreement to move the perimeter fence further west, to the east edge of the 12’ wide gravel shoulder, which would result in a 368-foot separation. If the 39.5-foot wing span correction is added at the new fence location, this results in an equivalent distance of 407 feet for use on Figure AA-42. That in turn would result in an ACRP predicted probability occurrence being once every 515 years, almost half the risk of a taxiway collision.

Given that the commercial use of aviation is itself only around 100 years old, these numbers of one predicted occurrence at the existing airport fence every 277 or 369 years, demonstrates the high level of safety that will be maintained at Aurora Airport with this MOS.

Given the regional and national importance of Aurora Airport for emergency medical, firefighting, and emergency power line moving, along with the use by local national corporations, using the MOS ensures the airport can continue to upgrade with safety improvements, and can continue to support the approximately 1,500 employees that rely on the airport for their livelihood.

This study shows definitively that the 2012 signing off on the Aurora Airport master plan and ALP with a modification of standards for the ROFA, by FAA and ODAV, was a reasonable and appropriate action to take. The same action should be taken for the current 2024 master plan work.

Author: Aron Faegre is an architect, civil engineer, physicist, and pilot who has been the lead planner and designer on over two hundred airport planning and development projects in Oregon, Washington, California, New York, and British Columbia over the past 35 years. He has a Master of Architecture from MIT and a Bachelor of Physics from Reed College.

ARON FAEGRE AND ASSOCIATES
AVIATION PLANNING AND DESIGN SERVICES FIRM PROFILE

Introduction

Aron Faegre and Associates is a multi-disciplinary firm with a special interest in performing planning and engineering for aviation projects. The principal of the firm, Aron Faegre, personally manages the firm's key projects and is an aviation planner, architect, civil engineer, and landscape architect. He is also an instrument rated commercial pilot.

Mr. Faegre's firm has completed aviation projects for the following clients:

- Oregon Department of Aviation
- Port of Walla Walla
- Quinault Indian Nation
- Horizon Air
- Southwest Airlines
- Columbia Helicopters
- Helicopter Transport Services
- Oregon Health Sciences University
- Kaiser Hospital
- Atlantic Aviation
- The Port of Portland
- Port of Columbia County Scappoose)
- The City of Portland
- City of Pendleton
- Washington State DOT
- Life Flight Network
- Van's Aircraft
- City of Newberg
- Transwestern Aviation
- Flightcraft PDX

Aviation Services

Aron Faegre & Associates provides consulting services on all aspects of aviation facilities design including:

- Airport Master Plans
- Maintenance Hangars and Shops
- Storage Hangars
- Terminals and Concourses
- Airport Layout Plans
- Runway Design
- Access Road Design
- Instrument Approach Drawings
- Apron Design
- Airport Economic Impact
- Noise Abatement Planning
- Environmental Assessment
- Fixed Base Operator Facilities
- Air Cargo Facilities
- Tenant Fit-up
- Obstruction Survey
- Taxiway Design
- Airport Security Design
- Aviation Land Use Planning
- Public-Private Partnerships

Aron Faegre, P.E, AIA is the principal of AFA, a multi-disciplinary planning and design firm. Mr. Faegre has a Master's Degree in Architecture from the Massachusetts Institute of Technology, during which he was also a National Science Foundation Fellow for three years. Mr. Faegre has a Bachelor's Degree in Physics from Reed College and has published research in scientific journals. He is licensed as a civil engineer, architect, and landscape architect. He is a commercial pilot with instrument rating. He also serves on the board of the Airway Science for Kids, an Oregon non-profit, where he also leads the TeenFlight program – where teams of 15 teenagers build an RV-12is aircraft, and then get to experience flying the airplane they built.

Outlook

Fw: Aron Faegre master plan comments for December 23 submittal

From Brandy Steffen <brandy.steffen@jla.us.com>
Date Mon 2025-01-06 8:52 AM
To Ashley Balsom <ashley.balsom@jla.us.com>; Jen Winslow <Jen.winslow@jla.us.com>

2 attachments (4 MB)
Mod standards Aurora Airport 2024-12-23c.pdf; Drainfields Aurora Airport 2024-12-23 final.pdf;

BRANDY STEFFEN | **JLA PUBLIC INVOLVEMENT**
Senior Program Manager + Partner
She/Her » Why pronouns matter
brandy.steffen@jla.us.com » Office 503-235-5881 » jla.us.com
Meeting + email hours 9 a.m.–5 p.m. Monday–Thursday » Administrative-only hours Friday
Check my availability » Schedule a 30 minute check-in

JLA Public Involvement's mission: To create collaborative, meaningful and exceptionally effective public processes that lead to better, more inclusive outcomes.

Please note: I will be on vacation, without access to my email, starting Friday, 01/24/25 and returning Monday, 02/03/25.

From: faegre@earthlink.net <faegre@earthlink.net>
Sent: Monday, December 23, 2024 3:15 PM
To: Brandy Steffen <brandy.steffen@jla.us.com>; 'THOMAS Alex R' <Alex.R.THOMAS@odav.oregon.gov>; 'Tony Beach' <anthony.beach@aviation.state.or.us>
Cc: 'David Waggoner' <willametteaviation@icloud.com>; Bruce Bennett <bruce@auroraaviation.com>; 'Tony Helbling' <helbling@wilsonconst.com>; Ted Millar <tmillar@tlmholdingsllc.com>; 'Denis Pilon' <pilond@htsc.ca>
Subject: Aron Faegre master plan comments for December 23 submittal

Hi Brandy, Thomas, and Tony,

Attached are two documents for the master planning to use in modifying the airport plans in creating a final plan.

Please confirm receipt.

Thanks, and hoping you have a great holiday,

Aron

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December 23, 2024

Alex Thomas, Planning and Programs Manager
Tony Beach, State Airports Manager
Oregon Department of Aviation
Brandy Steffen, JLA
Oregon Department of Aviation
3040 25th Ste SE
Salem, OR 97602
Alex.R.Thomas@odav.oregon.gov

Re: Aurora State Airport Master Plan Proposed Preferred Alternative Use of Modifications of Standards

Mr. Thomas, Mr. Beach, and Ms. Steffen:

Please share this letter with the ODAV and FAA design team, and enter it letter into the record for the Oregon Department of Aviation's (ODAV) proposed "Preferred Alternative" for the Aurora State Airport Master Plan.

We support Director Sugahara's statement that ODAV is willing to modify its Preferred Alternative for the Aurora Airport Master Plan to show a phased compliance with various standards, especially the Runway Object Free Area (ROFA). This letter is to especially remind all parties that a phased approach, iteratively working toward compliance, is completely consistent with, and part of the process for using the FAA's modification of standards process.

The FAA's directions for master planning and airport design clearly describe and allow the use of the modification of standards process, and it is appropriate that it be used for the Aurora Airport Master Planning effort. In fact, it is imminently reasonable because otherwise if the master plan describes a phased process to resolve issues of standards, for the process to be successful, it will need a modification of standards, so why wait to find out the answer? The master plan process is precisely when it should be applied for and resolved.

In service of the ODAV and FAA process to accomplish this, we have prepared a risk analysis based on FAA funded methodology, that shows a modification of

standards for the ROFA provides a completely acceptable level of safety. It shows that the risk of occurrence is that an occurrence would not occur within 275 years, which is more than twice as long as the FAA standard of acceptable risk is a 100-year period.

We should keep in mind that the actual history of mankind's successful creation of flying machines – dating to the first flight on December 17, 1903 in Kitty Hawk, North Carolina – represents a period of only 121 years. The risk analysis shows that the predicted risk to an incident at the edge of the Aurora Airport existing runway fence exceeds even this by 156 years. In the world of aviation that is many lifetimes – the FAA standards for ROFA's will have changed many times by that date.

Given that the new, incoming United States President is creating a Department of Government Efficiency that is intended to root out unreasonable use of federal funds, it will be appropriate to ensure that the final approved Aurora Airport Master Plan presents an efficient, reasonable, practical, and attainable plan of action. It cannot propose the expenditure of hundreds of millions of dollars to solve aviation issues that have an unlikely risk of happening, if at all, more than two hundred years from today. By then, it can reasonably be expected that the ROFA will be clear or some other design standard will have been imposed due to unimaginable changes in aircraft technology.

We request that the Aurora Airport Master Plan effort use the established standards that actually apply to all FAA funded master plans. It is important that the Aurora Airport planning effort be allowed the same opportunities that other airports around the United States are allowed, and not discriminated against.

Concerning when Modifications of Standards are allowed to be used, we note that the AC describing Airport Master Planning work, AC 150/5070-6B with Change 2, identifies below (yellow highlight added) that:

- The ALP should show all planned modification to the airport (they do not need to yet be approved); and

- The ALP narrative should discuss modifications to FAA Airport Design Standards (there is no prohibition to applying for the mod during the master planning work) and discuss the stages of development with sketches, which would include planned mods of design standards.

202. TYPES OF MASTER PLANNING STUDIES

c. **Airport Layout Plan Updates** – An update of the airport layout plan (ALP) drawing set should be an element of any master plan study. In fact, keeping the ALP current is a legal requirement for airports that receive Federal assistance. An update of the ALP drawing set will reflect actual or planned modifications to the airport and significant off-airport development. An accompanying ALP Narrative Report should explain and document those changes and contain at least the following elements:
1) Basic aeronautical forecasts.

2) Basis for the proposed items of development.

3) Rationale for unusual design features and/or modifications to FAA Airport Design Standards.

4) Summary of the various stages of airport development and layout sketches of the major items of development in each stage. An ALP drawing set update is an appropriate alternative to a full master plan whenever the fundamental assumptions of the previous master plan have not changed. If there have not been any major changes in airport activity or improvements that have had unanticipated consequences, a master plan update is not necessary. Another situation where only an ALP update would be appropriate is the examination of a single development item, such as runway safety area improvements. As indicated above, an ALP update will typically involve fewer elements than a full master plan study, including only the aviation demand forecasts, an assessment of facility requirements, a facility implementation and financing plan, and an airport layout plan drawing set. If additional steps are required to complete the ALP update, a full master plan study is probably a better choice.

205. MASTER PLAN REVIEW BY THE FAA

a. The recommendations contained in an airport master plan represent the views, policies and development plans of the airport sponsor and do not necessarily represent the views of the FAA. Acceptance of the master plan by the FAA does not constitute a commitment on the part of the United States to participate in any development depicted in the plan, nor does it indicate that the

proposed development is environmentally acceptable in accordance with appropriate public law. The FAA reviews all elements of the master plan to ensure that sound planning techniques have been applied. However, the FAA only approves the following elements of airport master plans:

1) ***Forecasts of Demand*** – The master plan forecast should be reviewed to ensure that the underlying assumptions and forecast methodologies are appropriate. Paragraph 704.h of this guidance should be used to determine consistency of the master plan forecast levels and the Terminal Area Forecast (TAF). Inconsistencies between the master plan forecast and TAF must be resolved, and the forecast approved, before proceeding with subsequent planning work.

2) ***Airport Layout Plan*** – All airport development at Federally-obligated airports must be done in accordance with an FAA- and sponsor-approved ALP. Furthermore, proposed development must be shown on an approved ALP to be eligible for Airport Improvement Program (AIP) funding. FAA approval of the ALP indicates that the existing facilities and proposed development depicted on the ALP conforms to the FAA airport design standards in effect at the time of the approval or that an approved modification to standard has been issued. Such approval also indicates that the FAA finds the proposed development to be safe and efficient.

801. FACILITY REQUIREMENTS - GENERAL

c. The requirements for new or expanded facilities reflect the unique circumstances of each airport, such as, but not limited to, the following:
1) Capacity shortfalls, which are commonly driven by growing demand.

2) Enhanced security requirements mandated by the Transportation Security Administration, including the flexibility to respond to changes in threat levels.

3) Updated standards developed and adopted by the FAA or other regulatory agencies, to correct existing non-standard conditions and eliminate existing modifications to standards. If there are approved modifications to standards, planners should review the reasoning that led to those adjustments. The facility requirements chapter should indicate if those deviations will continue or will be eliminated in the new master plan.

4) The airport sponsor's strategic vision for the airport. Such needs are typically associated with a sponsor's strategic business plan, mission statement, or similar plans that will require modification of the airport.

5) The outdated condition, arrangement, or functionality of existing facilities.

1008. DOCUMENTATION GUIDELINES

a. The requirements for documentation of the ALP drawing set must be determined with the airport sponsor and the reviewing agency or State agency. Documentation will typically

include a complete reduced-size set of the ALP drawing set and the accompanying text. The master plan will provide the narrative if the ALP is prepared as part of a master plan. If the ALP is prepared separately as an ALP Update, an ALP narrative is required. Then narrative will typically describe ALP development criteria and the rationale for the development shown on the ALP. Examples of these include airport reference code-related design criteria unique to specific areas of the airfield, or known or proposed modifications to FAA design standards. (See Section 202.c of this AC for further guidance on the ALP Narrative Report.)

Order 5300.1G Modifications to Agency Airport Design, Construction, and Equipment Standards

1.Purpose of this Order. This order establishes the process for the initiation, revision, coordination, and management of Modifications of Standards (MOS) applicable to airport design, construction material, and equipment projects. This order is the foundation of a web-based automated application of MOS. The automated application for submitting MOS is a step-by-step process facilitated within Airports Geographic Information System (AGIS).

2.Applicability. This order is applicable to all projects funded under the Airport Improvement Program (AIP) and Passenger Facility Charge (PFC) programs at all obligated airports, or as required to support any public approach procedure. Eligibility determinations under AIP or PFC are independent of any approval action for an MOS. New MOS requests initiated after March31, 2018, must use the automated MOS process. Manual MOS processing must follow applicable sections of this order as it applies to current regional procedures until the automated tool is accessible.

5. Definitions

e.Modification of Standards (MOS). Any deviation from, or addition to standards, applicable to airport design, material, and construction standards, or equipment projects resulting in an acceptable level of safety, useful life, lower costs, greater efficiency, or the need to accommodate an unusual local condition on a specific project through approval on a case-by-case basis.

7.Background. Laws, regulations and Airport Sponsor Grant Assurances require compliance with current FAA standards. The following provisions require an airport to meet FAA standards:

c.Obligated Airport. Title 49 U.S.C. § 47107(a)(16) and Grant Assurance No. 29, *Airport Layout Plan*, require the airport to maintain an up-to-date Airport Layout Plan (ALP) depicting existing and future airport facilities as referenced in paragraph 12.b. AC 150/5070-6, *Airport Master Plans*, establishes standards for ALPs, which includes the requirement to identify unusual design features and/or modifications to FAA Airports design standards. FAA approval of an ALP indicates the existing or proposed development depicted on the ALP conforms to FAA airport design standards or that an approved modification to standards has been issued.

12.Documentation.

a.All records pertaining to the MOS, including documents, pictures, and/or approval letters,will be maintained within the Airports GIS MOS Tool.

b.The airport must update the ALP to reflect approved modifications of airport design standards. The airport must include in the ALP a table listing the approved MOS. The table must include the approval letter dates and identify associated airspace review case numbers.

In addition, we note that AC 150/5300-13B Airport Design, Change 1, identifies below (yellow highlight added) that:

- Mods are intended for cases where an unusual local condition for a specific project maintains an acceptable level of safety, and we have prepared a draft mod (attached to this letter) for use of the project, which shows that occurrences are predicted to only occur in 275 or more years, which satisfies the FAA's standard for acceptable safety; and

- There is no established FAA prohibition from requesting the mod now, during the planning process.

1.5 **Definitions.**
60. *Modification of Standards.* Any approved deviation from published FAA standards applicable to an airport design, construction, or equipment project that is necessary to accommodate an unusual local condition for a specific project while maintaining an acceptable level of safety and performance. FAA Order 5300.1 establishes FAA policy for administering requests for modification of standards.
Chapter 2. DESIGN PRINCIPLES

2.8 **Modification of Standards.**
Site-specific conditions may make it impractical to meet all FAA design standards at an airport. The FAA considers, on a case-by-case basis, modifications to design standards that result in an acceptable level of safety and efficiency. Specific operational controls may be necessary to establish an acceptable level of safety for operation of aircraft at the airport. FAA Order 5300.1 establishes FAA policy for administering airport requests for modification of standards. See paragraphs 2.4 and 2.5.

2.8.1 The FAA views an approved modification of standards as an interim measure intended to mitigate unique site-specific conditions. Unless the FAA explicitly states otherwise in the approval action, the FAA expects airports with approved modifications to pursue ways to meet design

standards. This may occur incrementally over time or at such time it becomes practical to correct the non-standard condition.

2.8.2 The FAA will not consider any request to modify design standards associated with the following:

1. RSA dimensions
2. OFZ dimensions
3. Approach or departure surface dimensions
4. Standards established within a regulation (e.g., stopway, clearway).

2.8.3 An airport seeking FAA approval of modification to a design standard submits a request using the Modification of Standards application tool within the Airport Data and Information Portal (ADIP) at https://adip.faa.gov. The FAA relies on the following information, in part, to determine the acceptability of a modification to FAA design standards:

1. Information on the standard proposed for modification.
2. Description of proposed modification and why the airport cannot meet standards.
3. Statement addressing how modification will provide an acceptable level of safety, economy, durability, and workmanship.
4. Listing of any special operational measures necessary to accommodate the modification.

2.4 **Addressing Non-standard Airport Conditions.**
The FAA expects airport owners to address non-standard conditions through the airport planning process. The FAA acknowledges that conformance to current standards is not always practical. However, the FAA expects airports to continue to investigate mitigation measures, whether in one or multiple phases, and correct the non-standard conditions over time.
1.The FAA expects implementation of new or revised standards to occur through the planning process.
2.If there is an explicit or immediate safety deficiency for a non-standard condition, the FAA expects airport owners to prioritize the mitigation of the safety deficiency using the current standard.
3.Inconvenience does not represent an acceptable justification for non-conformance to standards.
4.Justifications based on impractical conditions do not represent a permanent justification for non-conformance to standards.

In conclusion, we request that ODAV and FAA allow Aurora Airport to use the established process of modification of standards to resolve certain issues at the airport, where they are expressly permitted, and not expressly denied as options.

The FAA's modification of standards process is wisely set up precisely for such a condition as what we find at Aurora Airport – LET'S USE IT.

Respectfully submitted,



Aron Faegre, AIA, PE
Aron Faegre Airport Planning and Design

Attachment: Proposed modification of standards risk analysis document for use at Aurora Airport
dated October 5, 2024.

Aron Faegre Airport Planning & Design 13200 Fielding Road Lake Oswego Oregon 97034 aron@faegre.org

Aurora State Airport (UAO)
Proposed Modification of
Runway Object Free Area (ROFA) Design Standards

Prepared by: Aron Faegre, AIA, PE
Aron Faegre Airport Planning & Design

October 5, 2024

This memorandum provides an analysis and methodology by which a Modifications of FAA Airport Design Standards (MOS) at the Aurora State Airport (UAO), for the Runway Object Free Area (ROFA) can be justified as:

> "… resulting in an acceptable level of safety, useful life, lower costs, greater efficiency, or the need to accommodate an unusual local condition on a specific project through approval on a case-by-case basis." - FAA Order 5300.1G, page 1.

as defined and permitted under FAA Order 5300.1G Modifications to Agency Airport Design, Construction, and Equipment Standards[1].

1. BACKGROUND

The Aurora State Airport is surrounded by farm lands, near Aurora, Oregon, at the northern end of Marion County. It primarily serves aviation businesses involved with:

- emergency medical transport[2],
- aviation heavy-lift helicopter fire-fighting and power line construction companies, and for military (for which fixed wing aircraft are essential for support),[3]
- business jets for numerous major national corporations based within 10 miles,

[1] FAA Order 5300.1G Appendix A specifically gives FAA Office of Airport (ARP) and Region the authority to issue a MOS for Runway Object Free Areas. The Order can be downloaded at: https://www.faa.gov/documentLibrary/media/Order/order-5300-1G-modifications-to-standards.pdf .

[2] Regional headquarters for Life Flight Network, with bases all over Oregon, Washington, Idaho, Montana, and Nevada.

[3] Columbia Helicopters, Helicopter Transport Services, Wilson Construction, companies that work internationally with headquarters at Aurora Airport. Many of the companies have annual contracts with state and federal agencies to provide major support for fighting fires, as well as for humanitarian relief work world-wide. Some of these companies have U.S. military contracts for repair and rebuilding of military aircraft at the Aurora site. The use of the Aurora Airport runway is essential to all of these companies for rapid providing of crews, equipment, and repairs to helicopters in active service of fighting fires, moving power lines, or doing rescue, relief, or humanitarian work.

- aircraft manufacturing for the S-LSA (Special Light-Sport Aircraft) and kit-build industry[4], and
- other general aviation aircraft using the airfield for business, pilot training, and recreational flying.

There is no scheduled air service using the airport. The State of Oregon Department of Aviation (ODAV) owns, governs, and manages the public lands of the airport. Most of the business aircraft based at the airport access the runway via through-the-fence permits with ODAV.

Flights by based business jets, such as a Challenger 300, dictate that the Airport Reference Code is C-II. Due to the geometry of the existing site, the airport does not meet current FAA design standards for the ROFA, due primarily to adjacent Highway 551 to the west of the runway.

Most recently ODAV's planned solution[5] to meeting these standards ("Refined Preliminary Alternatives Summary", by Century West Engineering, dated July 31, 2024) is one of only two options:

- relocate the highway further west, (which involves acquiring both private residential and commercial properties further west), or
- relocate the runway, taxiway, and control tower east (which involves acquiring many acres of existing private property already developed with hangars, taxilanes, and aprons for aviation uses) and demolishing numerous large 40,000 square foot aviation hangars along the taxiway.

Both options have very high financial and environmental costs (probably in the greater than $100 million range), which would make them difficult to ever be implemented. If this master plan is approved as currently planned, and one of these options were not implemented, then ODAV and FAA have reported that the airport would only receive maintenance funding and no additional safety improvement funds. This would result in the airport not keeping pace with the aviation industry standards of safety. The second option (moving the runway, control tower, and demolishing hangars), If implemented, would in addition force closure of many of the major medical transport and fire-fighting facilities on the airport, and would put many of the airport's 1,500 employees out of jobs.

It is noted that in the 2012 Airport Layout Plan (ALP), approved (signed) by both ODAV

[4] Van's Aircraft www.vansaircraft.com the international leader in S-LSA produced aircraft.
[5] Refined Preliminary Alternatives Summary document dated July 31, 2024 by Century West Engineer can be downloaded at: https://publicproject.net/files/UAOAMP/uao-refined-preliminary-alternatives-summary-1-.pdf?d952c4adef .

and FAA, the airport also had the same Runway Design Code (RDC) status of C-II and listed a MOS as the solution to the non-standard ROFA limitation on the west property line. At that time there was consensus between ODAV and FAA that a MOS was a reasonable solution.

This memorandum provides the evidence to show that the 2012 ALP was a good approach to resolution of the ROFA, and that it can reasonably be continued. This report demonstrates that there is an acceptable level of safety through modifying the ROFA standard for the specific deviation to standards located on the west side of the runway.

FAA standards for different airports ROFA's vary from 250 foot width, to an 800 foot width, depending on aircraft type using the airport. As will be shown below, the primary reason justifying the modification is that the going from B-II to C-II category is just where the 500-foot required ROFA width changes to an 800-foot wide required ROFA - yet this is the same width required for all RDC category aircraft all the way to E-VI -Portland International Airport, San Francisco Airport, and every other international airport in the country. UAO will never have the larger size of aircraft those airports accommodate – Boeing 737's to Boeing 777's – so a slight reduction in width on the west side provides a level of safety appropriate for UAO, which will always serve only much smaller aircraft.

Modifications of standards for ROFA's are common at even large national airports. For example, recently several MOS were adopted at San Jose International Airport for deficiencies in the ROFA, as well as for runway-taxiway separations, and for runway object free areas[6]. It even appears that Portland International Airport (PDX) may have their airport perimeter fence, the shoulder of NE Marine Drive, and improper grading within the 400-feet area from runway centerline, at the northeast corner of the ROFA for Runway 10L.

This memorandum provides the detailed technical background and mathematically calculated justification, needed for the FAA and ODAV to again approve a MOS for the ROFA at Aurora State Airport.

2. MOS PROCESS

The process for gaining a modification of standards is provided in FAA AC 150/5300-13B Airport Design[7] in Section 2.8. It states, and we provide commentary after each paragraph as

[6] Norman Y. Mineta San Jose International Airport Runway Incursion Mitigation/Airfield Design Standards Analysis, November 27, 2017. Justification for ROFA modifications in this document were often simply the practical and cost issues of modifying major adjacent highways, similar to what is at issue in a much smaller Aurora Airport.
[7] FAA AC 150/5300-13B Airport Design Available free on line at:
https://www.faa.gov/documentLibrary/media/Advisory_Circular/AC-150-5300-13B-Airport-Design-Chg1.pdf

to acceptability:

2.8 ***Modification of Standards.***

Site-specific conditions may make it impractical to meet all FAA design standards at an airport. The FAA considers, on a case-by-case basis, modifications to design standards that result in an acceptable level of safety and efficiency. Specific operational controls may be necessary to establish an acceptable level of safety for operation of aircraft at the airport. FAA Order 5300.1 establishes FAA policy for administering airport requests for modification of standards. See paragraphs 2.4 and 2.5.

This memorandum provides this information and finds that no specific operational controls are necessary, see comments on paragraph 2.4 below.

2.8.1 The FAA views an approved modification of standards as an interim measure intended to mitigate unique site-specific conditions. Unless the FAA explicitly states otherwise in the approval action, the FAA expects airports with approved modifications to pursue ways to meet design standards. This may occur incrementally over time or at such time it becomes practical to correct the non-standard condition.

The FAA and ODAV can work with Oregon Department of Transportation on master planning future revisions to State Highway 551 so that it can be corrected "at such time it becomes practical." Also, there are potential options where ODAV and ODOT could jointly agree to relocate the airport perimeter fence closer to Highway 551, which could be an "incrementally" established improvement.

2.8.2 The FAA will not consider any request to modify design standards associated with the following:

- *RSA dimensions*
- *OFZ dimensions*
- *Approach or departure surface dimensions*
- *Standards established within a regulation (e.g., stopway, clearway).*

The ROFA is not one of these.

2.8.3 An airport seeking FAA approval of modification to a design standard submits a request using the Modification of Standards application tool within the Airport Data and Information Portal (ADIP) at https://adip.faa.gov. The FAA relies on the following information, in part, to determine the acceptability of a modification to FAA design standards:

- *Information on the standard proposed for modification.*
- *Description of proposed modification and why the airport cannot meet standards.*
- *Statement addressing how modification will provide an acceptable level of safety, economy, durability, and workmanship.*
- *Listing of any special operational measures necessary to accommodate the modification.*

This document was prepared to provide the analysis needed for ODAV to submittal for the MOS per Section 2.4.

> *2.4 Addressing Non-standard Airport Conditions.*
> *The FAA expects airport owners to address non-standard conditions through the airport planning process. The FAA acknowledges that conformance to current standards is not always practical. However, the FAA expects airports to continue to investigate mitigation measures, whether in one or multiple phases, and correct the non-standard conditions over time.*

It is important to re-emphasize the above statement, that the FAA here "acknowledges that conformance to current standards is not always practical." Further, per this paragraph, the current master planning activity is the appropriate place for this analysis and the formal establishment of a MOS for the ROFA. This report and analysis identifies intermediate steps that can be taken, such as relocating the airport perimeter fence, that will iteratively move the airport closer to compliance.

This analysis utilizes an FAA established safety analysis methodology to show that the MOS provides an acceptable level of safety. The study found no special measures needed to accommodate the modification.

3. METHODOLOGY

In 2011, the Transportation Research Board (TRB) released Airport Cooperative Research Program (ACRP) Report #51 – Risk Assessment Method to Support Modifications of Airfield Separation Standards. The ACRP is funded by the Federal Aviation Administration (FAA). Report #51 is used to support the ROFA MOS requested at Aurora State Airport.

The proposed ROFA MOS is modeled in this report in accordance with Appendix A – Risk Assessment Methodology of ACRP Report #51[8].

This report uses risk plots, along with the annual number of operations, to analyze the cumulative risks associated with Runway to Object Separations. The operations numbers at UAO are taken from the current draft Master Plan, and are numbers already approved by the FAA in a letter[9] to ODAV dated November 15, 2023 (corrected January 23, 2024). For sake of a conservative analysis, we are using the most distant forecast projects for the year 2041, which are:

- 90,231 total operations all RDC categories, of which
- 862 operations are of RDC C-II and D aircraft

[8] ACRP Report #51 – Risk Assessment Method to Support Modifications of Airfield Separation Standards is available free on line at: https://nap.nationalacademies.org/catalog/14501/risk-assessment-method-to-support-modification-of-airfield-separation-standards

[9] Federal Aviation Administration (FAA) Aurora (UAO Aviation Activity Forecast Approval Airport Improvement Program Grant Number 3-41-0004-022-2021 available at: https://publicproject.net/files/2024-01/Aurora-Airport/uao-forecast-approval-20231115-corrected-20240123.pdf?57af6c19b7

For operations involving the runway, per the methods of Report #51, the risk is analyzed based on three distinct phases of flight:

a. Landing - Airborne Phase
b. Landing - Ground Phase
c. Takeoff

The separation distance from the runway centerline to an object is used with the associated risk plot to calculate the risk of collision per operation.

The risk of collisions per operation is then analyzed along with the number of annual airport operations for the appropriate phase of flight to determine the predicted frequency of occurrence. The frequency of occurrence is used to determine the FAA likelihood level using Table A-3 from ACRP Report #51 which is shown below:

Table A-3. FAA likelihood levels (FAA, 2010).

	General	Airport Specific	ATC Operational	
			Per Facility	NAS-wide
Frequent A	Probability of occurrence per operation is equal to or greater than 1×10^{-3}	Expected to occur more than once per week or every 2,500 departures (4×10^{-4}), whichever occurs sooner	Expected to occur more than once per week	Expected to occur every 1–2 days
Probable B	Probability of occurrence per operation is less than 1×10^{-3}, but equal to or greater than 1×10^{-5}	Expected to occur about once every month or 250,000 departures (4×10^{-6}), whichever occurs sooner	Expected to occur about once every month	Expected to occur several times per month
Remote C	Probability of occurrence per operation is less than 1×10^{-5} but equal to or greater than 1×10^{-7}	Expected to occur about once every year or 2.5 million departures (4×10^{-7}), whichever occurs sooner	Expected to occur about once every 1–10 years	Expected to occur about once every few months
Extremely Remote D	Probability of occurrence per operation is less than 1×10^{-7} but equal to or greater than 1×10^{-9}	Expected to occur once every 10–100 years or 25 million departures (4×10^{-8}), whichever occurs sooner	Expected to occur about once every 10–100 years	Expected to occur about once every 3 years
Extremely Improbable E	Probability of occurrence per operation is less than 1×10^{-9}	Expected to occur less than once every 100 years	Expected to occur less than once every 100 years	Expected to occur less than once every 30 years

Note: Occurrence is defined per movement.

Source: ACRP Report #51

The key takeaway from Table A-3 is that for a specific airport, if the likelihood of incidence is less than once every 100 years it is considered a “Extremely Improbable” Class E occurrence.

A Hazard Severity Classification is then assigned based on the worst credible outcome of an incident. Since the ACRP method is based on wingtip separation, the report states that: “From the point of view of risk and based on the records of incidents and accidents,

the worst credible consequence expected for wingtip collisions of two taxiing aircraft is aircraft damage" (ACRP Report #51 page 19). A similar aircraft damage expectation would be a wingtip collision with the airport perimeter fence, which is the ROFA limitation examined in this report.

The Hazard Severity Classifications were determined in accordance with Table A-4 FAA Severity Definitions from ACRP Report #51 and are shown below:

Table A-4. FAA severity definitions (FAA, 2010).

Hazard Severity Classification				
Minimal 5	**Minor 4**	**Major 3**	**Hazardous 2**	**Catastrophic 1**
No damage to aircraft but minimal injury or discomfort of little consequence to passenger(s) or workers	- Minimal damage to aircraft; - Minor injury to passengers; - Minimal unplanned airport operations limitations (i.e. taxiway closure); - Minor incident involving the use of airport emergency procedures	- Major damage to aircraft and/or minor injury to passenger(s)/ worker(s); - Major unplanned disruption to airport operations; - Serious incident; - Deduction on the airport's ability to deal with adverse conditions	- Severe damage to aircraft and/or serious injury to passenger(s)/ worker(s); - Complete unplanned airport closure; - Major unplanned operations limitations (i.e. runway closure); - Major airport damage to equipment and facilities	- Complete loss of aircraft and/or facilities or fatal injury in passenger(s)/ worker(s); - Complete unplanned airport closure and destruction of critical facilities; - Airport facilities and equipment destroyed

Source: ACRP Report #51

Then, using both the FAA likelihood level and the Hazard Severity Classification the risk is then analyzed using Figure A-1 FAA Risk Matrix from ACRP Report #51, shown below:

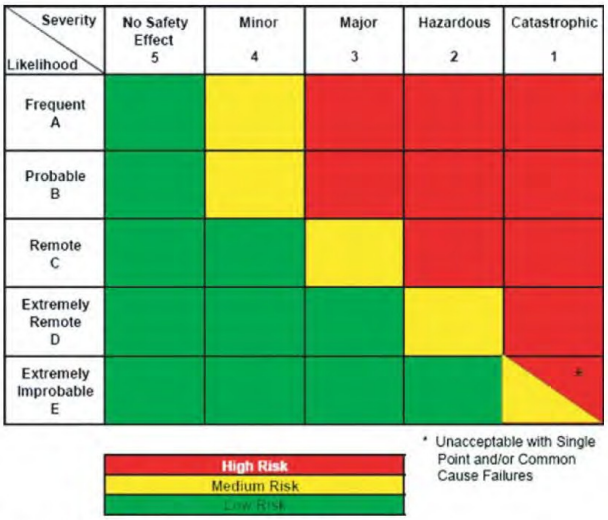


Figure A-1. FAA risk matrix (FAA, 2010).

Source: ACRP Report #51

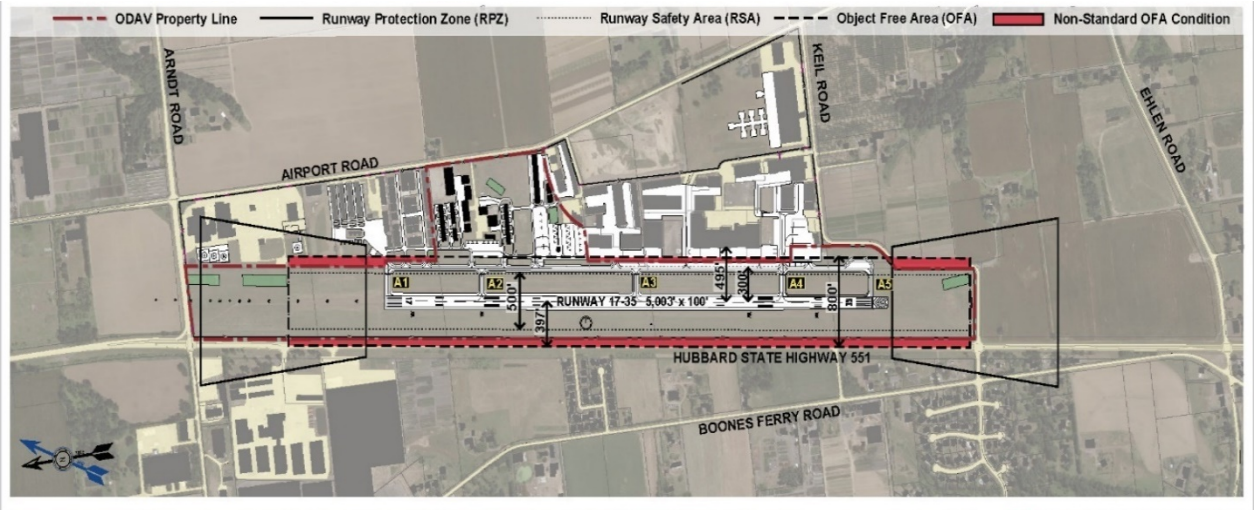
Based on Figure A-1 if the incident is Extremely Improbably (i.e. more than 100 years probability) the risk is considered “Low,” except for an incident considered catastrophic. We will use these graphs to evaluate the results from the detailed risk analysis of UAO below.

4. UAO ANALYSIS

In 2012 Master Plan and ALP established the UAO runway RDC, given existing based aircraft, as C-II, up from a B-II. The required ROFA width of a B-II runway is 500 feet centered on the runway. As it turns out, any runway of higher RDC than a B-II requires 800 feet in width. Thus, the UAO required C-II ROFA width is 800 feet centered on the runway. This 800-foot width is the standard used for aircraft ranging from a Challenger 300 business jet to the largest Boeing 777 or even the largest military aircraft. The 2012 approved ALP lists the ROFA deviation as a modification to standards, since the airport perimeter fence and Highway 551 were within the ROFA.

The UAO forecast of operations predicts that by the year 2041 there will be 90,230 annual operations at the airport, of which 862 would be an RDC above the B-II category. Thus, the 89,368 operations by B-II or lesser category clearly are operating well within ROFA safety standards, as the existing runway to road separations provide more than the 500-foot required width. It is just the 862 operations that need to be analyzed for ROFA safety relative to the required 800-foot width.

The deficiencies in the existing Runway OFA at UAO are shown in the Figure below:



UAO Figure A: Highway 551 Shown as ROFA Deviation Object
Source: Century West Engineers, Aurora State Airport Draft Airport Master Plan, Working Paper No. 1, Figure 2-15, November 2023 (Updated)

The current ROFA object deficiencies are:

d. Hubbard State Highway 551 for which the OFA penetrates 3 feet beyond the highway centerline. (368' to 377' clear width available from outer edge of highway gravel shoulder to Runway CL)
e. Perimeter Fence Inside OFA (312' clear width from Runway CL)

Potentially the airport fence could be relocated to the east edge of the 12-foot-wide gravel shoulder, since both the highway and the airport are owned by the State of Oregon. There can be an agreement between ODOT and ODAV to allow this. Relocating the fence in this way would result in a minimum width of the ROFA on the west side of the runway, to a 368-foot clearance - which would be only 32 feet out of conformance.

However, we will evaluate the ROFA for the existing conditions, and thus use the location of the airport perimeter fence as the maximum ROFA available at this time.

When analyzing the risk associated with a reduction in Runway OFA it is important to consider the purpose of the design standard. Paragraph 3.12 of Advisory Circular 150/5300-13B defines the ROFA but does not give detailed design rational behind the standard:

> *"ROFA is a clear area limited to equipment necessary for air and ground navigation, and provides wingtip protection in the event of an aircraft excursion from the runway"*

Appendix I, Paragraph I.8 of Advisory Circular 150/5300-13B provides the only available reference to the design rationale behind the Runway OFA width:

> *"The ROFA serves two principal purposes: 1. Development buffer in proximity to a runway, and 2. Wing clearance for a runway excursion event to the outer limit of the RSA.* `

Appendix I, in Section I.8.2, also clarifies that part of the "development buffer" intent is:

> *"Protection of the ROFA also reserves space for future development of a parallel taxiway that permits proper alignment of aircraft at a holding position on an entrance taxiway."*

However, for the given physical layout of UAO there can be no plan for a parallel taxiway on the west side of the runway, because of the location of Highway 551 and that there never can be hangars or other aviation uses on that side of the runway. Therefore, that leaves the only ROFA purpose for UAO as only "wingtip clearance for a runway excursion" which is precisely what this analysis provides.

Below we will analyze resolving the ROFA utilizing the risk analysis method of ACRP Report #51, for the case:

- No Change to existing ROFA conditions on West Side of Runway (Hwy 551 and Airport Perimeter Fence remain as existing) resulting in a 312-foot clearance to runway CL.

Per the methodology of ACRP Report 51, we analyze the risks for each of the takeoff and landing scenarios. For landing operations, the analysis is further divided into two parts: airborne (approach) phase and ground (landing rollout) phase. However, because the risk of veering off the runway during takeoff is so much less than for during landing, the methodology indicates that usually it is not necessary to evaluate takeoff option except if there are runways that only are used for takeoffs and not for landings. We will do that takeoff evaluation in any case, just to clearly determine what it is in the UAO context.

Since the existing runway to taxiway separation meets the current criteria for a C-II airport, for this study that analysis would seem unnecessary. However, we will include that option in this report because it provides a baseline of safety that the AC 150-5300-13B Airport Design Standards have determined is an acceptable and appropriate level of safety for a C-II airport.

Thus, for this UAO ROFA analysis separate risks are developed for each of:

1. Airborne Phase (Landing) is for instrument approaches which terminate the approach as a missed approach, and the risk is hitting another object such as hitting the airport perimeter fence or a vehicle on Highway 551 (using ACRP Report 51 Fig. 31); “the airborne risk is computed only for missed approaches” (ACRP Report 51, page 21).
2. Ground Phase (Landing Rollout) where risk is veering off the runway into the reduced width ROFA and hitting the fence or a car on Highway 551 (using ACRP Report 51 Fig 42). Figure 42 is based on the assumption that the risk is between the two wingtips of two aircraft, one aircraft on the edge of the runway and the other at the centerline of a taxiway. The ACRP makes clear that the x-axis distance on the Risk Figures are centerline of runway to centerline of taxiway because the risk is assumed aircraft to aircraft. However, the predicted risk is based on the wingtip-to-wingtip distance. When using the Risk Figures for objects (not aircraft) like a fence or road (which has no wings), half of the wingspan should be added to the distance to compensate for the wingtip-to-wingtip assumption. Thus, per Group II standards, the clearance distance used for Figure 42 should add half of 79 feet (equals 39.5 feet) of additional clearance, which would create a total of 351 feet to use in Fig. 42. The risk shown with the 312 feet and the 351 feet are each shown in figures.

3. Ground Phase (Takeoff) where risk is veering off the runway into the reduced width ROFA and hitting the fence or a car on Highway 551 (using ACRP Report 51 Fig 49).

Finally, to have more relevant data, we will also perform the risk analysis of the standard required 300-foot separation between runway centerline and taxiway centerline for a landing, which is the level of safety the AC 150/5300-13B sets for in a C-II airport:

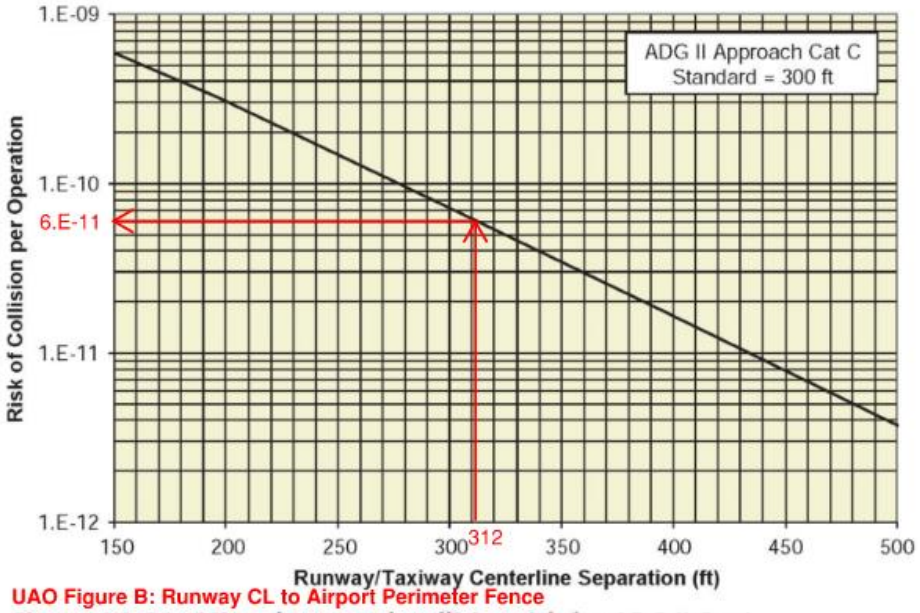
4. Ground Phase (Landing Rollout) where risk is veering off the runway into the taxiway (using ACRP Report 51 Fig 42).

This data will give us an example of an acceptable level of safety utilized in AC 150/5300-13B for a C-II airport.

5. Specific Analysis: Proposed MOS Option - No Change to Existing ROFA Conditions (312' Separation from Runway Centerline to Airport Fence)

The Perimeter Fence at the west side is located 312 feet from the runway centerline. The risks associated with leaving it there as a modification of standards, for each of the phases of flight are analyzed below:

1. Airborne Landing Phase Risk from Reduced ROFA – For a very conservative analysis we will assume that this includes all approach to landings, not just missed approaches. Using the separation of 312' and Figure AA-33 in Appendix A of ACRP Report #51, the following provides a risk level 6.0E-11 of occurrence per landing (which as an inverse, is one chance in a 16.7 trillion landings) that an aircraft gets 312' from the runway centerline. This can be seen in the figure below:

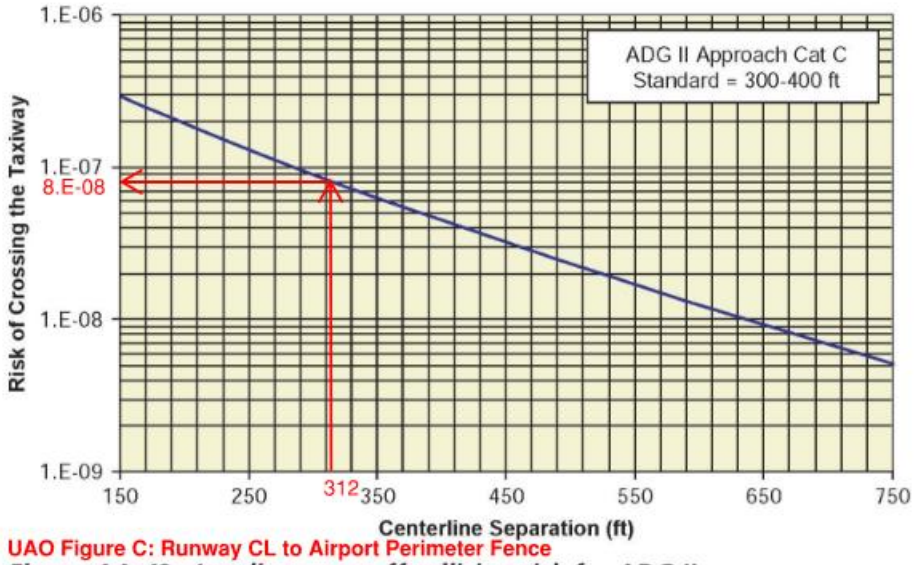


UAO Figure B: Runway CL to Airport Perimeter Fence

Figure AA-31. Missed approach collision risk for ADG II Cat I.

The current annual number of landing operations at UAO is approximately 45,115 or half of the 90,230 annual operations. As the risk is one incident in every 16.7 trillion landings, the time between occurrences is calculated as 16 trillion landings divided by 45,115 landing operations per year which equates to one incident every 369,000 years. Thus, this risk is of no significance.

2. Landing Roll Phase Risk for Reduced ROFA - Using the separation of 312' and Figure AA-43 in Appendix A of ACRP Report #51, provides a risk level 8.0E-08 or in the inverse: one chance in 12.5 million landings. This can be seen in the figure below:



UAO Figure C: Runway CL to Airport Perimeter Fence

Figure AA-42. Landing veer-off collision risk for ADG II.

As the risk is one incident in every 12.5 million landings, the rate of occurrence is calculated as 12.5 million landings divided by 45,115 landings per year which equates to one incident every 277 years.

Using the ACRP described adjustment when the object is not another aircraft and half the C-II wingspan can be added to the clearance distance, results in a separation of 351' and Figure AA-43 in Appendix A of ACRP Report #51, provides a risk level 6.0E-08 or one chance in 16.7 million landings. This can be seen in the figure below:

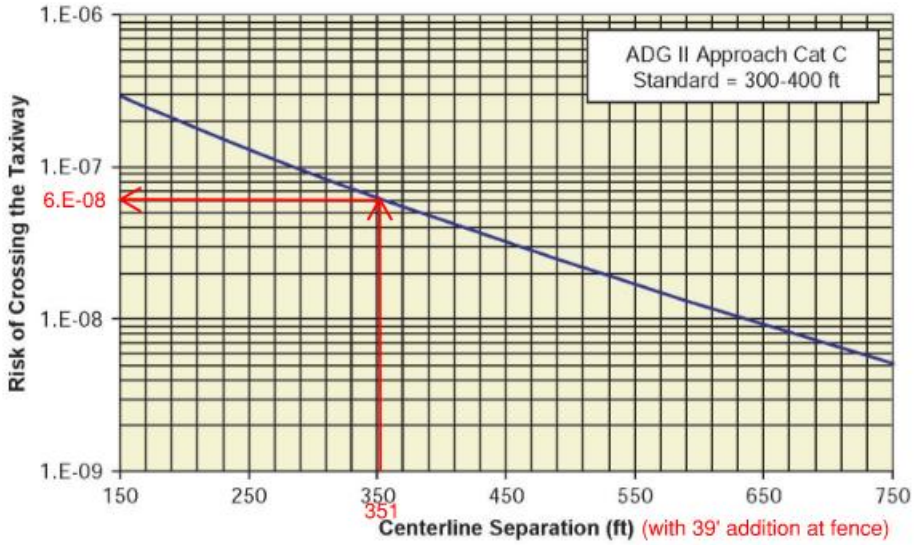
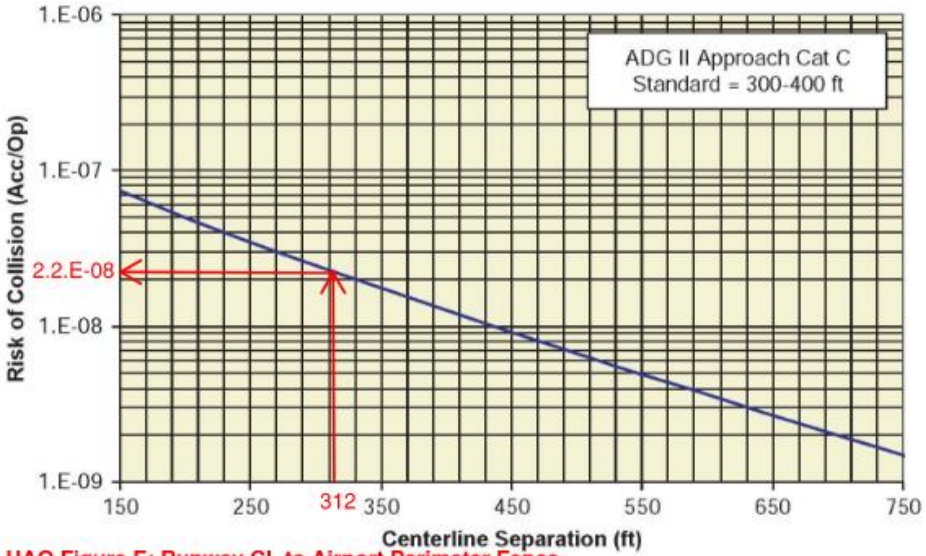


Figure AA-42. Landing veer-off collision risk for ADG II.
UAO Figure D: Runway CL to Airport Perimeter Fence Including Wingspan adjustment

As the risk is one incident in every 16.7 million landings, the rate of occurrence is calculated as 16.7 million landings divided by 45,115 landings per year which equates to one incident every 369 years.

3. Takeoff Roll Phase Risk for Reduced ROFA - Using the separation of 312' and Figure AA-49 in Appendix A of ACRP Report #51, provides a risk level 2.2E-08) or one chance in 45.5 million takeoffs. This can be seen in the figure below:

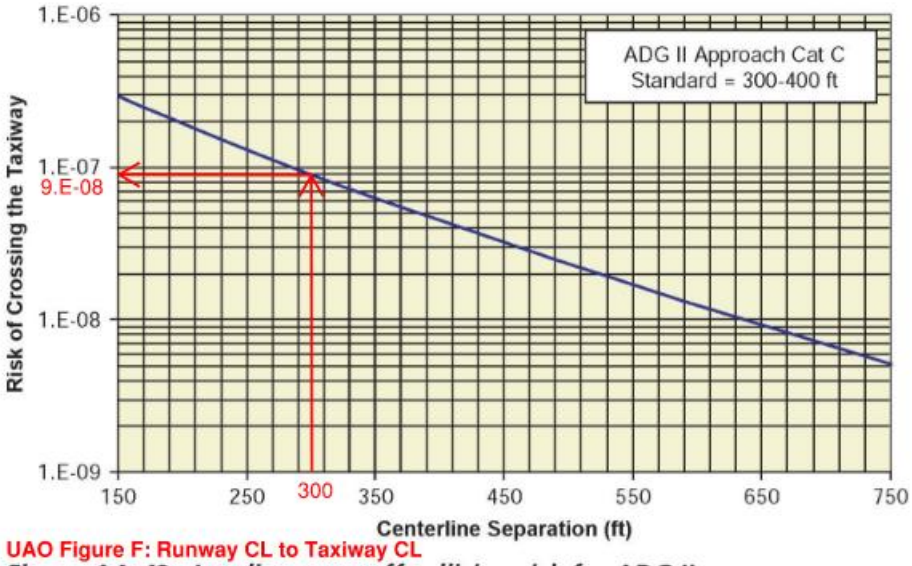


UAO Figure E: Runway CL to Airport Perimeter Fence
Figure AA-49. Takeoff veer-off collision risk for ADG II.

As the risk is one incident in every 45.5 million takeoffs, the rate of occurrence is calculated as 45.5 million takeoffs divided by 45,115 takeoffs per year which equates to one incident every 1,008) years.

Finally, as a test of the level of safety that AC 150/5300-13B considers acceptable we check what the predicted risk level is of the existing runway-taxiway separation considered appropriate[10] by FAA.

4. Landing Roll Phase Risk to Taxiway Consistent with Safety Standards of AC 150/5300-13B - Using the separation of 300' and Figure AA-43 in Appendix A of ACRP Report #51, provides a risk level 9.0E-08 or one chance in 11.1 million landings. This can be seen in the figure below:



UAO Figure F: Runway CL to Taxiway CL

Figure AA-42. Landing veer-off collision risk for ADG II.

As the risk is one incident in every 11.1 million landings, the rate of occurrence is calculated as 11.1 million landings divided by 45,115 landings per year which equates to one incident every 246 years.

[10] Note that Section 3-24 of Order 5100.38D Change 1 states that the FAA will not fund airport safety greater than that in the Airport Design standards, so the standard set by the runway-taxiway separation is a significant number. Order 5100.38D Change 1 can be downloaded for free at: https://www.faa.gov/documentLibrary/media/Order/AIP-Handbook-Order-5100-38D-Chg1.pdf

6. Conclusions

Considering the risk of each phase of flight, the risk of collision during the landing roll is the controlling factor. The Hazard Severity Classification for this type of operation would be major and the acceptable probability of occurrence is remote (1E-05) or less than once every 1-10 years. The following table summarizes the risk associated with each phase of flight:

Phase of Flight	Rate of Occurrence	Acceptable Level
Airborne Phase	Once every 369,000 years	Yes
Landing Roll Phase	Once every 277 years (or 369 years with calculation adjustment for fence object in lieu of wing object)	Yes
Takeoff Roll Phase	Once every 1,000 years	Yes

A runway to object separation of 312’ provides an acceptable level of safety as the controlling occurrence is once every 277 years (or 369 years with the adjustment for wingspan at the fence as allowed in the ACRP method). This is much less risk than the once per 100 years FAA standard shown in Table A-3 and results in a Category E “Extremely Improbable” occurrence. Further, per ACRP’s method, a wingtip to fence occurrence is considered by ACRP’s method to be a Table A-4 Minimal Severity occurrence. This combination via Figure A-1 concludes that the outcome as Low Risk.

Figure UAO F shows that the existing risk of occurrence between the existing runway and existing taxiway, which fully meets FAA standards, is one in every 246 years. This means that the risk to an occurrence at the taxiway, is much less (i.e. longer duration between events) than the FAA’s 100-year standard. The risk of collision with the perimeter fence is then even much less than that of a taxiway collision.

Finally, there is an incremental improvement option of ODAV and ODOT coming to an agreement to move the perimeter fence further west, to the east edge of the 12’ wide gravel shoulder, which would result in a 368-foot separation. If the 39.5-foot wing span correction is added at the new fence location, this results in an equivalent distance of 407 feet for use on Figure AA-42. That in turn would result in an ACRP predicted probability occurrence being once every 515 years, almost half the risk of a taxiway collision.

Given that the commercial use of aviation is itself only around 100 years old, these numbers of one predicted occurrence at the existing airport fence every 277 or 369 years, demonstrates the high level of safety that will be maintained at Aurora Airport with this MOS.

Given the regional and national importance of Aurora Airport for emergency medical, firefighting, and emergency power line moving, along with the use by local national corporations, using the MOS ensures the airport can continue to upgrade with safety improvements, and can continue to support the approximately 1,500 employees that rely on the airport for their livelihood.

This study shows definitively that the 2012 signing off on the Aurora Airport master plan and ALP with a modification of standards for the ROFA, by FAA and ODAV, was a reasonable and appropriate action to take. The same action should be taken for the current 2024 master plan work.

Author: Aron Faegre is an architect, civil engineer, physicist, and pilot who has been the lead planner and designer on over two hundred airport planning and development projects in Oregon, Washington, California, New York, and British Columbia over the past 35 years. He has a Master of Architecture from MIT and a Bachelor of Physics from Reed College.

Aron Faegre, AIA, PE 13200 Fielding Road Lake Oswego Oregon 97034 503-880-1469 faegre@earthlink.net

December 23, 2024

Alex Thomas, Planning and Programs Manager
Tony Beach, State Airports Manager
Oregon Department of Aviation
Brandy Steffen, JLA
Oregon Department of Aviation
3040 25th Ste SE
Salem, OR 97602
Alex.R.Thomas@odav.oregon.gov

Re: Aurora State Airport Master Plan Proposed Preferred Alternative
Septic Drainfield Geotech Report Review: Additional Information

Mr. Thomas, Mr. Beach, and Ms. Steffen:

Please share this letter with the ODAV and FAA design team, and enter it into the record for the Oregon Department of Aviation's (ODAV) proposed "Preferred Alternative" for the Aurora State Airport Master Plan.

Century West Engineering in the last few days has added some email history from December 2022 through February 2023 concerning the use of existing drainfields. HDSE had proposed modifying the drainfields by using a top layer of modern geofabrics through which grass can grow up through. These materials are specifically designed to allow support loads like fire trucks in grass areas. The FAA standard for soil compaction required in the Runway Safety Area requires that it be capable, in dry conditions, of supporting fire trucks as well as aircraft. At Aurora Airport aircraft maximum weights will all be similar or less than a fire truck. In fact, NV5 designed the fabric in this case, to be capable of supporting the largest Gulfstream aircraft. These modern geofabrics provide an innovative and inexpensive way to comply with the FAA soil strength standards.

Per the attached additional email history, we had specifically requested that our geotech (NV5) be allowed to talk directly to ODAV's geotech (GRI), in order to resolve the final detailed questions. It is noted that NV5 and GRI are Oregon's two most prestigious and experienced geotech firms. It is reasonable to have them talk together and resolve final review issues, since they are the experts on the subject. We are still requesting ODAV to allow this joint meeting to occur.

It also was our understanding, that before completing the review of use of geofabrics at the septic fields, ODAV first wanted to examine another possibility, that the HDSE sewer system might use the Columbia Helicopters drainfields at the north end of the airport. ODAV was thinking this might be in lieu of using the geofabric at the existing drainfield site. It was our understanding that ODAV was creating a report to determine if that would be a viable alternative. Has that report been completed?

Another issue raised, was that with ODAV denying the geotech engineers an opportunity to talk to each other, it seemed that the review process was not proceeding in good faith. Tony Helbling was discussing this problem with ODAV upper management as will be seen in one of the attached emails. It was requested that the review be accomplished in a more collaborative approach.

We request that the two geotech companies simply be allowed to talk together about the proposed use of geofabric at the existing drainfields, and see if there is common ground to show that a solution is possible. This is not rocket science, as these geofabrics are now in regular use in many civil engineering applications that require allowing vehicular loads on soft ground. It is reasonable to have this proposed use at the drainfields continue to be vetted by geotechnical experts.

Respectfully submitted,



Aron Faegre, AIA, PE
Aron Faegre Airport Planning and Design

Attachments:

Copies of emails dated 2022-2-20 from Martha Meeker, 2022-1-18 from Tony Beach, 2021-12-22 from Tony Beach

faegre@earthlink.net

From: Martha Meeker <meekerma92@msn.com>
Sent: Sunday, February 20, 2022 12:29 PM
To: Helbling, Tony
Cc: Ted Millar; Aron Faegre
Subject: Re: HDSE Drain Field Issue

Hi Tony,

Copy all on coming up with something a little more creative and let me chat with Betty a bit this week. I won't be around until the latter part of next week so if we could postpone the zoom chat until then I would appreciate it.

Best,
Martha

From: Helbling, Tony <helbling@wilsonconst.com>
Sent: Friday, February 18, 2022 10:55 AM
To: MeekerMA92@msn.com <meekerma92@msn.com>
Cc: Ted Millar <tmillar@tlmholdingsllc.com>; Aron Faegre <faegre@earthlink.net>
Subject: HDSE Drain Field Issue

Martha,

Bottom Line Up Front – we're asking for a "sea change" in the way we are working with ODA – a change to where we can work collaboratively in real time rather than barrier/administrative methodology. We're hoping your leadership could help with this philosophical change in how we could work together.

1st off – we are appreciative of the meeting Betty and Tony Beach held the other day with the engineers to discuss the drain field issues.

2nd – we're hoping to shift to a different, collaborative methodology in which we can work together instead of vertical, authoritative, administrative approach spelled out by Tony Beach following that meeting. (see attached – specifically second to the last paragraph).

ODA and multiple other users at Aurora stand to benefit as we seek to both continue to use the existing drain field and explore the expansion in the RSA, specifically on the west side toward HWY 551. We understand and respect James Kirby's position that a design would include, say a vault lid, that would need to withstand the point load of a G650 nose gear. (We got excited that he's going to allow G650s at KUAO!)

With that said, we'd like to work collaboratively and develop solutions that meet requirements as opposed to our side of the team expending a lot of time and expense to develop something that may not get approved. (For example - how we got to today's meeting, submittals leading to questions, leading to engineering, leading to delayed meetings with weeks in between as ODA decision makers decide who is allowed to talk to who. We asked on the call for Brett (our engineer) to be able to communicate ideas directly with Lindsey (ODA consultant) – this was met with trepidation by Tony Beach on behalf of ODA and the resulting email.)

One of the underlying foundations of ODA's charter and as called out in the Oregon Aviation Plan is to further and promote General Aviation in Oregon – especially at State airports. Additionally, KUAO as called out by SB680 a while back which is not codified in state law. That said, thinking here, on this drain field issue is that we come to an agreement on a vision for providing a usable drain field that benefits ODA's properties (tower and land holdings) as well as other entities on the airport HDSE, the CAA and at least the Condo Association in between if not more.

Once we share that vision, we (to include ODA's contracted engineers) shift from a proposal/review methodology to a joint effort, collaboratively working to design a system that will serve the airport, long into the future. The thing is, as a public/private partnership approach, private enterprise would be carrying the bulk of the load with respect to design and construction and the ODA would be reaping the benefit (for a substantial savings over going it alone) to get services for ODA properties. This becomes especially important as we look to the State's resiliency efforts, we're both jointly working toward at the Governor's Office level.

The clock is ticking on the existing drain field. Because the August, 2024 end date is looming on the horizon, we have a few choices; HDSE could expend time and money on the alternative to disposing of the effluent outside the RSA, or we could spend that same money and time on coming up with a long term solution that benefits more than just the HDSE. We'd like to pursue the latter!

We'd like to brainstorm with ODA and explore the potential of extending the existing lease to a time later than 2024 - to coincide with the runway extension. Ideas would include the collaborative planning of a new drain field where we've already done the exploration on that west side of where the runway extension would be. The actual construction of the pipe runs and drain field could be done concurrently with the runway extension construction.

Bottom Line – we're asking for a "sea change" in the way we are working with ODA – a change to where we can work collaboratively in real time rather than a vertical barrier/administrative methodology. We're hoping your leadership could help with this philosophical change in how we could work together.

Again – we're appreciative of the meeting and we'd really like to move forward. This project could be a shining example of furthering GA in Oregon for everyone involved.

Are you available to get on a zoom call, early next week to discuss? Tuesday is open for us.

Tony Helbling
Logistics Manager
Wilson Construction Company
1190 NW 3rd Ave
Canby, OR 97013
Cell: 503-519-6059
Office: 503-263-6882
helbling@wilsonconst.com
www.wilsonconst.com

faegre@earthlink.net

From: BEACH Anthony <Anthony.BEACH@odav.oregon.gov>
Sent: Tuesday, January 18, 2022 2:05 PM
To: Aron Faegre; 'Michelle DaRosa'; 'Tony Helbling'
Cc: STANSBURY Betty; 'Ted Millar'; 'Martha Meeker'
Subject: RE: HDSE drainfield expansion area at UAO

Hi Aron, Happy New Year.

Our consultants are still reviewing the information you provided. I will get an update and see if your geotech consultants can provide any assistance.

I'll keep you updated as soon as I get more information, thanks for your patience!

Tony Beach
OREGON DEPARTMENT OF AVIATION
STATE AIRPORTS MANAGER
OFFICE 503-378-2523 **CELL** 503-302-5455
M-F 7:30am – 4pm

From: Aron Faegre <faegre@earthlink.net>
Sent: Monday, January 17, 2022 12:23 PM
To: BEACH Anthony <Anthony.BEACH@odav.oregon.gov>; 'Michelle DaRosa' <mdarosa@landandcondolaw.com>; 'Tony Helbling' <helbling@wilsonconst.com>
Cc: STANSBURY Betty <Betty.STANSBURY@odav.oregon.gov>; 'Ted Millar' <tmillar@tlmholdingsllc.com>; 'Martha Meeker' <meekerma92@msn.com>
Subject: RE: HDSE drainfield expansion area at UAO

This message was sent from outside the organization. Treat attachments, links and requests with caution. Be conscious of the information you share if you respond.

Hi Tony,

Hope your holidays went well.

Would it help to have our geotech consultant meet with your geotech consultant to get this resolved? We have provided detailed information for each of your questions, showing that the runway safety area complies with FAA standards. The standards acknowledge that utility systems can be in runway safety areas, and this is an important utility system for the airport.

Aron

Aron Faegre, AIA, PE, ASLA
Aron Faegre Architect
13200 Fielding Road
Lake Oswego, Oregon 97034
503-880-1469
faegre@earthlink.net

www.faegre.org

From: Aron Faegre <faegre@earthlink.net>
Sent: Tuesday, December 21, 2021 4:14 PM
To: 'BEACH Anthony' <Anthony.BEACH@aviation.state.or.us>; 'Michelle DaRosa' <mdarosa@landandcondolaw.com>; 'Tony Helbling' <helbling@wilsonconst.com>
Cc: 'STANSBURY Betty' <Betty.STANSBURY@aviation.state.or.us>; 'Ted Millar' <tmillar@tlmholdingsllc.com>; 'Martha Meeker (MeekerMA92@msn.com)' <meekerma92@msn.com>
Subject: RE: HDSE drainfield expansion area at UAO

Hi Tony

One last thing. I should have added a note to your question about whether infiltration testing was done. The testing for a drainfield is quite different than for normal stormwater infiltration testing. In fact, too rapid of an infiltration requires a more complicated septic drainfield piping design. Our septic processing system and drainfield designs are approved directly through State of Oregon DEQ.

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faegre@earthlink.net
www.faegre.org

From: Aron Faegre <faegre@earthlink.net>
Sent: Tuesday, December 21, 2021 3:07 PM
To: 'BEACH Anthony' <Anthony.BEACH@aviation.state.or.us>; 'Michelle DaRosa' <mdarosa@landandcondolaw.com>; 'Tony Helbling' <helbling@wilsonconst.com>
Cc: 'STANSBURY Betty' <Betty.STANSBURY@aviation.state.or.us>; 'Ted Millar' <tmillar@tlmholdingsllc.com>; 'Martha Meeker (MeekerMA92@msn.com)' <meekerma92@msn.com>
Subject: RE: HDSE drainfield expansion area at UAO

Hi Tony,

Attached are the answers to your detailed questions. Does this provide the information you need to approve our proposal?

Aron

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Aron Faegre Architect
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From: BEACH Anthony <Anthony.BEACH@aviation.state.or.us>
Sent: Thursday, December 9, 2021 4:20 PM
To: Michelle DaRosa <mdarosa@landandcondolaw.com>; Tony Helbling <helbling@wilsonconst.com>
Cc: STANSBURY Betty <Betty.STANSBURY@aviation.state.or.us>; Ted Millar <tmillar@tlmholdingsllc.com>; Aron Faegre - Aron Faegre & Associates (faegre@earthlink.net) <faegre@earthlink.net>; Martha Meeker (MeekerMA92@msn.com) <meekerma92@msn.com>
Subject: RE: HDSE drainfield expansion area at UAO

Hi Michelle, thank you for your patience as we look into the information you have provided.

Our consultants have taken a first pass through the report along with their Geotech GRI, and they came up with the following list of questions/clarifications/additional information needed:

GRI requests the additional data listed below based on reviewing the November 8, 2021 report "Report of Geotechnical Engineering Services: Aurora State Airport Septic Drain Field Improvements for HDSE Sewer System." [*HDSE drainfield expansion Geotech Study AronFA-2-01-110821-geor.pdf*]

- Field Data Collection
    - Date of soil sampling
    - Were any logs prepared to describe the bulk sampling results?
    - Was a sieve analysis and/or Atterberg Limits test performed to validate the Silt visual classification?
    - Was infiltration testing performed? If not, why?

- As-builts or other construction documents pertaining to the existing drain field

- Report references
    - Geoweb design procedure
    - Provide addition discussion on how the 6-inch geoweb, with 2/3 aggregate and 1/3 topsoil, replaces 12 inches of compacted soil.
    - Equivalent Single Wheel Load source
    - Source identifying the critical aircraft type

- Report figures
    - Figure A-1: graphic does not show up in the provided pdf
    - Figure A-2: graphic does not show up in the provided pdf

- "Such stringent compaction is not permitted in the soil cover of drain fields"
    - Where does this statement come from?

In addition to the list above, we will also need specifics on the proposed Geoweb reinforced drain field construction.

- Materials/Construction Proposed
    - What materials specification is to be used (ODOT, proprietary, etc.) for the aggregate?
    - What compaction specifications and test methods are proposed to achieve the proposed Geoweb strengths?
    - What compaction specifications and test methods are proposed for soil layers to be placed along with the Geoweb?
    - What subgrade compaction specifications and test methods are proposed for the expanded drain field areas?
    - What materials are proposed for use in the rest of the elements of the drain field system (pipes, manifolds, perf spec., etc.)?

Could you please provide this information so I may forward it to our consultants for review?

Thank you,

Tony Beach
OREGON DEPARTMENT OF AVIATION
STATE AIRPORTS MANAGER
OFFICE 503-378-2523 **CELL** 503-302-5455
M-F 7:30am – 4pm

From: Michelle DaRosa <mdarosa@landandcondolaw.com>
Sent: Monday, November 15, 2021 3:51 PM
To: BEACH Anthony <Anthony.BEACH@aviation.state.or.us>; Tony Helbling <helbling@wilsonconst.com>
Cc: STANSBURY Betty <Betty.STANSBURY@aviation.state.or.us>; Ted Millar <tmillar@tlmholdingsllc.com>; Aron Faegre - Aron Faegre & Associates (faegre@earthlink.net) <faegre@earthlink.net>; Martha Meeker (MeekerMA92@msn.com) <meekerma92@msn.com>
Subject: RE: HDSE drainfield expansion area at UAO

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Re-sending to include Ms. Martha Meeker.

Michelle D. Da Rosa
Attorney at Law
205 SE Spokane Street, Suite 300
Portland, OR 97202
Office: (503) 220-2891
Direct: (971) 600-6307
www.landandcondolaw.com



From: Michelle DaRosa
Sent: Monday, November 15, 2021 3:25 PM
To: Tony Beach (anthony.beach@aviation.state.or.us) <Anthony.BEACH@aviation.state.or.us>; Tony Helbling <helbling@wilsonconst.com>
Cc: Betty Stansbury (betty.stansbury@aviation.state.or.us) <Betty.STANSBURY@aviation.state.or.us>; Ted Millar <tmillar@tlmholdingsllc.com>; Aron Faegre - Aron Faegre & Associates (faegre@earthlink.net) <faegre@earthlink.net>
Subject: FW: HDSE drainfield expansion area at UAO

Dear Betty and Anthony,

This missive from me, in my capacity as the attorney for TLM Holdings LLC and from Tony Helbling, as a director of HDSE Sewer System Owners Association and Chairperson of the Southend Corporate Airpark Condominium Owners Association, requests that you (i) rescind your denial of HDSE's plans to expand the HDSE drainfield on UAO property, (ii) retract ODA's stated intention to not renew HDSE's drainfield lease in

2024, and (iii) issue an approval of the expansion plans as previously submitted earlier this year. The attached study and our explanations below respond to the concerns ODA cited as the reason for its decisions.

The denial of the proposed expansion was sent to me in the email from Anthony dated July 30, 2021 in the email string below. ODA's expansion denial and threat to terminate the drainfield located on the Aurora State Airport that serves HDSE users (all buildings at Southend) sent concerned shock-waves through the Southend Airpark community because of the vital importance of the drainfield to the HDSE Sewer System, and the HDSE Sewer System to the continued operation of all of the property at Southend. The threat to "not renew" was made notwithstanding that the Non-Commercial Site Lease provides HDSE with two 5-year options and that the Utility Easement recorded as Instrument No. 2020-00001957 on January 13, 2020 is perpetual.

The attached geotechnical study by NV5 (formerly known as GeoDesign), dated November 8, 2021 demonstrates through detailed soil analysis that the drainfield areas already are likely capable "under dry conditions, of supporting snow removal equipment, aircraft rescue and fire-fighting equipment, and the occasional passage of aircraft without causing damage to the aircraft" [AC 150/5300-13A, p. 61]. The area is also free of objects, is drained by grading and a perimeter drain system to avoid accumulation of water, and has no ruts, humps, depressions or other surface variations, as required by the FAA's design standards for RSA's.

We propose resolution of this issue by:

a. Making no changes to the existing drainfields as they have been in the RSA for around 20 years now, with no problems occurring, and the gravel filled drainfield trenches already demonstrating regular supporting of tractors for mowing and thus physically demonstrating meeting the RSA vehicle support requirements.

b. For the new expansion drainfields use the addition of the 6 inch geo-fabric in the top layer, which then results in gaining of 95% compaction (in fact with a 1.5 safety factor bearing capacity over that).

In addition, we note as mitigating factors that:

- To promote the functionality of Aurora Airport as a resiliency resource following a major earthquake, the septic system will allow the airport to seamlessly continue operation following an earthquake, whereas those airports relying on urban sanitary systems will generally require from one month to a year to become functional after the earthquake – thus the HDSE's septic system is an advantage to promote at Aurora Airport.

- The existing and proposed drainfields are approximately 150 feet or more to the side of the runway centerline, and thus they are areas that are least likely to be needed for emergency use.

- Many existing areas of the RSA do not currently meet the 95% compaction requirement (as shown in the geotech study).

Sincerely yours,

Tony Helbling

Logistics Manager
Wilson Construction Company
1190 NW 3rd Ave
Canby, OR 97013
Cell: 503-519-6059
Office: 503-263-6882
helbling@wilsonconst.com
www.wilsonconst.com

Michelle D. Da Rosa
Attorney at Law
205 SE Spokane Street, Suite 300
Portland, OR 97202
Office: (503) 220-2891
Direct: (971) 600-6307
www.landandcondolaw.com

From: BEACH Anthony <Anthony.BEACH@aviation.state.or.us>
Sent: Friday, July 30, 2021 10:20 AM
To: Michelle DaRosa <mdarosa@landandcondolaw.com>
Subject: RE: HDSE drainfield expansion area at UAO

Good morning Ms. DaRosa,

I am writing to follow up on your request for 103,104 square feet of additional drain field and reserve area lease space at the Aurora State Airport. We understand your client, HDSE Sewer System Owners Association, already has 61,375 square feet of premises leased for a drain field, reserve area, and piping. We are also aware that the existing lease was entered into with a general understanding that additional space would be needed, and that additional space would be made available by the Oregon Department of Aviation. Though both drain field use and leasing within Runway Safety Areas are unusual in my experience, I have been working to honor that arrangement with the intent of accommodating the expansion.

In initiating the Pen and Ink change to our Airport Layout Plan for this expansion, some concerns were raised by the FAA regarding compatibility of drain fields and Runway Safety Areas (RSA). The RSA enhances the safety of aircraft which undershoot, overrun, or veer off the runway, and it provides greater accessibility for firefighting and rescue equipment during such incidents. There are four requirements that our RSAs must meet, those include being:

1. cleared and graded and have no potentially hazardous ruts, humps, depressions, or other surface variations;
2. drained by grading or storm sewers to prevent water accumulation;
3. capable, under dry conditions, of supporting snow removal equipment, Aircraft Rescue and Fire Fighting (ARFF) equipment, and the occasional passage of aircraft without causing damage to the aircraft; and
4. free of objects, except for objects that need to be located in the RSA because of their function…

To address these concerns we closely evaluated the information you provided, and we analyzed what impacts, if any, a drain field would have on meeting the RSA's design standards. What we have found is that generally leach field soils are

not compacted to the densities needed to support vehicle loads. The effluent from the waste stream has to be able to move into the pores of the soil around the drain tiles for the leach field to function. This increases the moisture content of the soils and further reduces their ability to support loads. At best, we are concerned that vehicle loading (including mowers) will reduce the porosity of the leach field soil (resulting in slower infiltration over time) or, at worst, cause damage to the shallow drain tiles and manifolds resulting in surface failures. It is our conclusion that drain fields in the RSA present a potential hazard to aircraft forced to roll out in the RSA. They are especially hazardous for heavier aircraft or those with higher tire pressures.

Due to the decreased soil strength and increased water accumulation caused by a drain field's function, we are unable to expand your client's drain field and reserve areas. Further, because the existing drain field and reserve area are not compatible within the RSA, we will not be able to renew the lease once the current term expires August 30th, 2024. At that time, all pipes and associated equipment will need to be removed by the Lessee, and the site will need to be returned to its original condition.

I am sorry I don't have a better answer for you, please let me know if you have any questions,

Anthony Beach, C.M., ACE
OREGON DEPARTMENT OF AVIATION
STATE AIRPORTS MANAGER
M-F 7:30am – 4pm

OFFICE 503-378-2523 **CELL** 503-302-5455
EMAIL Anthony.Beach@aviation.state.or.us
3040 25TH STREET SE, SALEM, OR 97302
WWW.OREGON.GOV/AVIATION

faegre@earthlink.net

From: BEACH Anthony <Anthony.BEACH@odav.oregon.gov>
Sent: Wednesday, December 22, 2021 8:08 AM
To: Aron Faegre; 'Michelle DaRosa'; 'Tony Helbling'
Cc: STANSBURY Betty; 'Ted Millar'; 'Martha Meeker'
Subject: RE: HDSE drainfield expansion area at UAO

Thanks Aron, I've forwarded this note over to our consultants as well.

Tony Beach
OREGON DEPARTMENT OF AVIATION
STATE AIRPORTS MANAGER
OFFICE 503-378-2523 **CELL** 503-302-5455
M-F 7:30am – 4pm

From: Aron Faegre <faegre@earthlink.net>
Sent: Tuesday, December 21, 2021 4:14 PM
To: BEACH Anthony <Anthony.BEACH@odav.oregon.gov>; 'Michelle DaRosa' <mdarosa@landandcondolaw.com>; 'Tony Helbling' <helbling@wilsonconst.com>
Cc: STANSBURY Betty <Betty.STANSBURY@odav.oregon.gov>; 'Ted Millar' <tmillar@tlmholdingsllc.com>; 'Martha Meeker' <meekerma92@msn.com>
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Cc: 'STANSBURY Betty' <Betty.STANSBURY@aviation.state.or.us>; 'Ted Millar' <tmillar@tlmholdingsllc.com>; 'Martha

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Subject: RE: HDSE drainfield expansion area at UAO

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Aron Faegre Architect
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Lake Oswego, Oregon 97034
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www.faegre.org

From: BEACH Anthony <Anthony.BEACH@aviation.state.or.us>
Sent: Thursday, December 9, 2021 4:20 PM
To: Michelle DaRosa <mdarosa@landandcondolaw.com>; Tony Helbling <helbling@wilsonconst.com>
Cc: STANSBURY Betty <Betty.STANSBURY@aviation.state.or.us>; Ted Millar <tmillar@tlmholdingsllc.com>; Aron Faegre - Aron Faegre & Associates (faegre@earthlink.net) <faegre@earthlink.net>; Martha Meeker (MeekerMA92@msn.com) <meekerma92@msn.com>
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STATE AIRPORTS MANAGER
OFFICE 503-378-2523 **CELL** 503-302-5455
M-F 7:30am – 4pm

From: Michelle DaRosa <mdarosa@landandcondolaw.com>
Sent: Monday, November 15, 2021 3:51 PM
To: BEACH Anthony <Anthony.BEACH@aviation.state.or.us>; Tony Helbling <helbling@wilsonconst.com>
Cc: STANSBURY Betty <Betty.STANSBURY@aviation.state.or.us>; Ted Millar <tmillar@tlmholdingsllc.com>; Aron Faegre - Aron Faegre & Associates (faegre@earthlink.net) <faegre@earthlink.net>; Martha Meeker (MeekerMA92@msn.com) <meekerma92@msn.com>
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Re-sending to include Ms. Martha Meeker.

Michelle D. Da Rosa
Attorney at Law
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Portland, OR 97202
Office: (503) 220-2891
Direct: (971) 600-6307
www.landandcondolaw.com

MICHELLE D. DA ROSA 2021 RECOGNIZED BY Best Lawyers

From: Michelle DaRosa
Sent: Monday, November 15, 2021 3:25 PM
To: Tony Beach (anthony.beach@aviation.state.or.us) <Anthony.BEACH@aviation.state.or.us>; Tony Helbling <helbling@wilsonconst.com>
Cc: Betty Stansbury (betty.stansbury@aviation.state.or.us) <Betty.STANSBURY@aviation.state.or.us>; Ted Millar <tmillar@tlmholdingsllc.com>; Aron Faegre - Aron Faegre & Associates (faegre@earthlink.net) <faegre@earthlink.net>
Subject: FW: HDSE drainfield expansion area at UAO

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Tony Helbling
Logistics Manager
Wilson Construction Company
1190 NW 3rd Ave
Canby, OR 97013
Cell: 503-519-6059
Office: 503-263-6882
helbling@wilsonconst.com
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Michelle D. Da Rosa
Attorney at Law
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Portland, OR 97202
Office: (503) 220-2891
Direct: (971) 600-6307
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From: BEACH Anthony <Anthony.BEACH@aviation.state.or.us>
Sent: Friday, July 30, 2021 10:20 AM
To: Michelle DaRosa <mdarosa@landandcondolaw.com>
Subject: RE: HDSE drainfield expansion area at UAO

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I am sorry I don't have a better answer for you, please let me know if you have any questions,

Anthony Beach, C.M., ACE
OREGON DEPARTMENT OF AVIATION
STATE AIRPORTS MANAGER
M-F 7:30am – 4pm

OFFICE 503-378-2523 **CELL** 503-302-5455

EMAIL Anthony.Beach@aviation.state.or.us

3040 25TH STREET SE, SALEM, OR 97302

WWW.OREGON.GOV/AVIATION

Outlook

RE: 12.23 FINAL AAIA TLM LTR Preferred alternative

From BEACH Anthony <Anthony.BEACH@odav.oregon.gov>
Date Fri 12/27/2024 7:47 AM
To faegre@earthlink.net <faegre@earthlink.net>; 'Wendie Kellington' <wk@klgpc.com>; THOMAS Alex R <Alex.R.THOMAS@odav.oregon.gov>; Brandy Steffen <brandy.steffen@jla.us.com>
Cc 'Ted Millar' <tmillar@wwpmi.com>; 'Tony Helbling - Wilson Construction Company' <helbling@wilsonconst.com>; 'Rachel Bacon' <rb@klgpc.com>; 'Senator Betsy Johnson - District 16' <betsy@betsyjohnson.com>; Bruce Bennett <bruce@auroraaviation.com>; 'David Waggoner' <willametteaviation@icloud.com>

Thanks Aron, we'll include this final version "b" in the record.

Tony Beach
OREGON DEPARTMENT OF AVIATION
STATE AIRPORTS MANAGER
OFFICE 503-378-2523 **CELL** 503-302-5455
M-F 7:30am – 4pm

From: faegre@earthlink.net <faegre@earthlink.net>
Sent: Thursday, December 26, 2024 5:22 PM
To: BEACH Anthony <Anthony.BEACH@odav.oregon.gov>; 'Wendie Kellington' <wk@klgpc.com>; THOMAS Alex R <Alex.R.THOMAS@odav.oregon.gov>; brandy.steffen@jla.us.com
Cc: 'Ted Millar' <tmillar@wwpmi.com>; 'Tony Helbling - Wilson Construction Company' <helbling@wilsonconst.com>; 'Rachel Bacon' <rb@klgpc.com>; 'Senator Betsy Johnson - District 16' <betsy@betsyjohnson.com>; Bruce Bennett <bruce@auroraaviation.com>; 'David Waggoner' <willametteaviation@icloud.com>
Subject: RE: 12.23 FINAL AAIA TLM LTR Preferred alternative

This message was sent from outside the organization. Treat attachments, links and requests with caution. Be conscious of the information you share if you respond.

Tony
Due to the short time frame I had to do much of this drawing while traveling for holidays, and I apologize for the difficulties with reading the drawing.

This attached pdf with the "b" after the date is hopefully finally cleaned up and easily readable.

Most importantly, I hope the concepts shown for:

1) phasing the corrections of the ROFA over several iterations through use of a mod of standard, and

2) ODAV being offered easements or purchase of properties for an internal circulation road that better will meet the circulation needs of this kind of airport where circulation is most often between existing businesses by walking, bicycle, or motor vehicle.

are useful. The airport users believe they are practical, efficient, and provide a solution that can be accomplished at reasonable cost.

Thanks

Aron

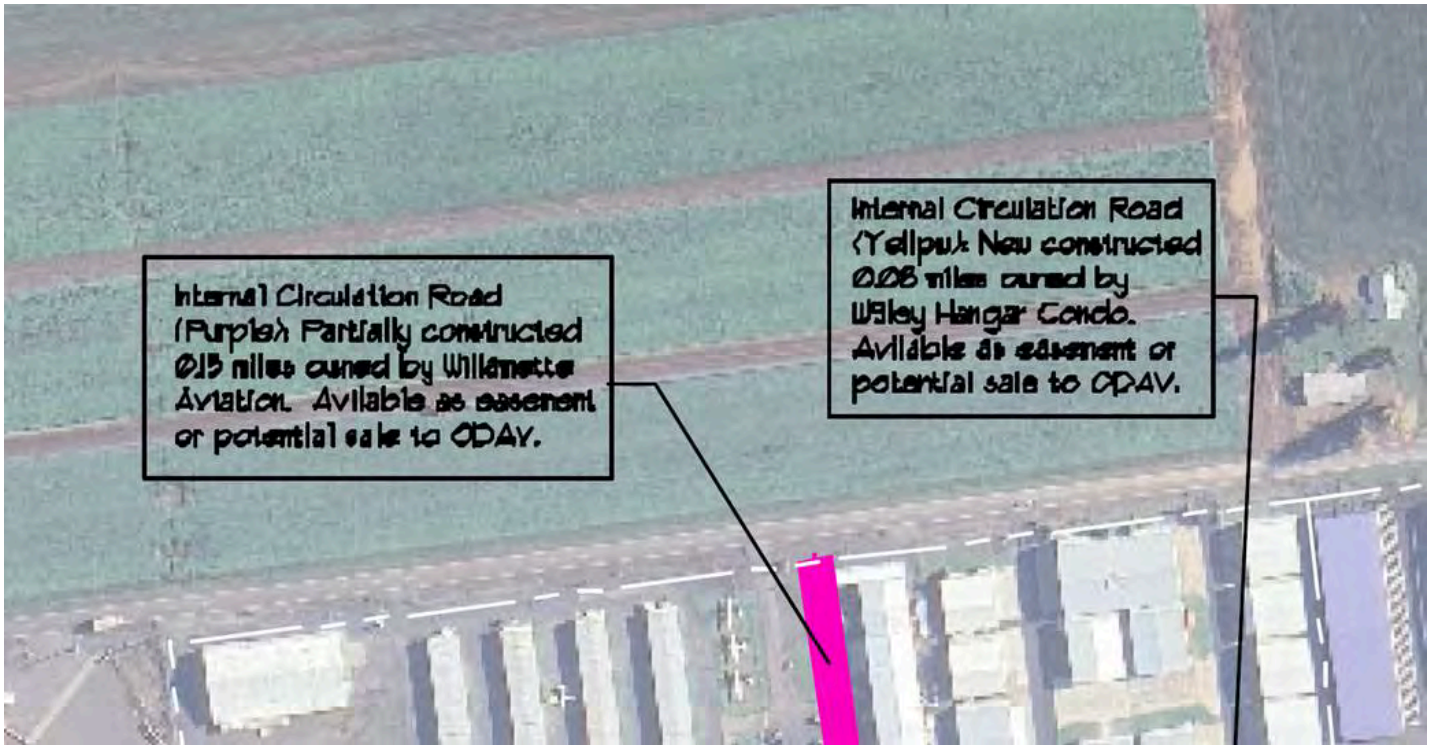
Aron

Aron Faegre, AIA, PE
Aron Faegre Architect
13200 Fielding Road
Lake Oswego, Oregon 97034
faegre@earthlink.net
www.faegre.org
503-880-1469

From: BEACH Anthony <Anthony.BEACH@odav.oregon.gov>
Sent: Tuesday, December 24, 2024 8:12 AM
To: faegre <faegre@earthlink.net>; Wendie Kellington <wk@klgpc.com>; THOMAS Alex R <Alex.R.THOMAS@odav.oregon.gov>; brandy.steffen@jla.us.com
Cc: Ted Millar <tmillar@wwpmi.com>; Tony Helbling - Wilson Construction Company (helbling@wilsonconst.com) <helbling@wilsonconst.com>; Rachel Bacon <rb@klgpc.com>; Senator Betsy Johnson - District 16 (betsy@betsyjohnson.com) <betsy@betsyjohnson.com>
Subject: RE: 12.23 FINAL AAIA TLM LTR Preferred alternative

Hi Aron,

Even zooming in (screenshot below) it is difficult to read, especially for anyone not as familiar with the airport and master plan discussions as we are. Just so there is no question surrounding your input, could you send it in again with more legible text?



Thank you and happy holidays,

Tony Beach
OREGON DEPARTMENT OF AVIATION
STATE AIRPORTS MANAGER
OFFICE 503-378-2523 **CELL** 503-302-5455
M-F 7:30am – 4pm

From: faegre <faegre@earthlink.net>
Sent: Monday, December 23, 2024 6:22 PM
To: Wendie Kellington <wk@klgpc.com>; BEACH Anthony <Anthony.BEACH@odav.oregon.gov>; THOMAS Alex R <Alex.R.THOMAS@odav.oregon.gov>; brandy.steffen@jla.us.com
Cc: faegre@earthlink.net; Ted Millar <tmillar@wwpmi.com>; Tony Helbling - Wilson Construction Company (helbling@wilsonconst.com) <helbling@wilsonconst.com>; Rachel Bacon <rb@klgpc.com>; Senator Betsy Johnson - District 16 (betsy@betsyjohnson.com) <betsy@betsyjohnson.com>
Subject: RE: 12.23 FINAL AAIA TLM LTR Preferred alternative

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Hi Tony

It is intended to either be printed on a large sheet of paper, or zoomed in to read specific areas.

I can revise to larger fonts, and submit the revision in a week if that is helpful. Just let me know.

Thanks for you help in making it as useful as possible.

Aron

Sent from my Verizon, Samsung Galaxy smartphone

-------- Original message --------
From: Wendie Kellington <wk@klgpc.com>
Date: 12/24/24 10:55 AM (GMT+10:00)
To: BEACH Anthony <Anthony.BEACH@odav.oregon.gov>, THOMAS Alex R <Alex.R.THOMAS@odav.oregon.gov>, brandy.steffen@jla.us.com
Cc: Ted Millar <tmillar@wwpmi.com>, "Tony Helbling - Wilson Construction Company (helbling@wilsonconst.com)" <helbling@wilsonconst.com>, Rachel Bacon <rb@klgpc.com>, "Aron Faegre (faegre@earthlink.net)" <faegre@earthlink.net>, "Senator Betsy Johnson - District 16 (betsy@betsyjohnson.com)" <betsy@betsyjohnson.com>, Rachel Bacon <rb@klgpc.com>
Subject: RE: 12.23 FINAL AAIA TLM LTR Preferred alternative

Hi Tony,

Thank you. Unfortunately, only Aron can do that as it is his document. I have inquired of him to do so. For what it is worth, when I zoom in I am able to read the text. Happy holidays to you as well. Best, Wendie

From: BEACH Anthony <Anthony.BEACH@odav.oregon.gov>
Sent: Monday, December 23, 2024 4:43 PM
To: Wendie Kellington <wk@klgpc.com>; THOMAS Alex R <Alex.R.THOMAS@odav.oregon.gov>; brandy.steffen@jla.us.com
Cc: Ted Millar <tmillar@wwpmi.com>; Tony Helbling - Wilson Construction Company (helbling@wilsonconst.com) <helbling@wilsonconst.com>; Rachel Bacon <rb@klgpc.com>; Aron Faegre (faegre@earthlink.net) <faegre@earthlink.net>; Senator Betsy Johnson - District 16 (betsy@betsyjohnson.com) <betsy@betsyjohnson.com>; Rachel Bacon <rb@klgpc.com>
Subject: RE: 12.23 FINAL AAIA TLM LTR Preferred alternative

It's the same, I would recommend changing the font if you can.

Thank you and happy holidays!

Tony

From: Wendie Kellington <wk@klgpc.com>
Sent: Monday, December 23, 2024 4:39 PM
To: BEACH Anthony <Anthony.BEACH@odav.oregon.gov>; THOMAS Alex R <Alex.R.THOMAS@odav.oregon.gov>; brandy.steffen@jla.us.com

Cc: Ted Millar <tmillar@wwpmi.com>; Tony Helbling - Wilson Construction Company (helbling@wilsonconst.com) <helbling@wilsonconst.com>; Rachel Bacon <rb@klgpc.com>; Aron Faegre (faegre@earthlink.net) <faegre@earthlink.net>; Senator Betsy Johnson - District 16 (betsy@betsyjohnson.com) <betsy@betsyjohnson.com>; Rachel Bacon <rb@klgpc.com>
Subject: RE: 12.23 FINAL AAIA TLM LTR Preferred alternative

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Tony,

The attached is how Aron sent the document to me. I changed it only to add Exhibit 1. Please see if the original unmarked version works better.

Aron,

Please see the below. Will you please provide the most legible version that you can of the Stakeholders alternative that was Exhibit 1 to my letter? Thank you. Best, Wendie

---

From: BEACH Anthony <Anthony.BEACH@odav.oregon.gov>
Sent: Monday, December 23, 2024 4:32 PM
To: Wendie Kellington <wk@klgpc.com>; THOMAS Alex R <Alex.R.THOMAS@odav.oregon.gov>; brandy.steffen@jla.us.com
Cc: Ted Millar <tmillar@wwpmi.com>; Tony Helbling - Wilson Construction Company (helbling@wilsonconst.com) <helbling@wilsonconst.com>; Rachel Bacon <rb@klgpc.com>; Aron Faegre (faegre@earthlink.net) <faegre@earthlink.net>; Senator Betsy Johnson - District 16 (betsy@betsyjohnson.com) <betsy@betsyjohnson.com>; Rachel Bacon <rb@klgpc.com>
Subject: RE: 12.23 FINAL AAIA TLM LTR Preferred alternative

Hi Wendie, thank you for your comments, this will be included in the record for the UAO master plan.

The text in the "EXHIBIT 1 MP- Masterplan Alternative 2024-12-23 final.pdf" attachment is not very legible, I'm not sure if the resolution got lost along the way, but even zooming in it is hard to read. Could you resend it with more legible text? I want to make sure we have a clear understanding of everything that has been submitted. If you need more time to edit the document, we'll accept an updated version of that document only by end of day 12/30/2024 (1 week).

Thank you,

Tony Beach
OREGON DEPARTMENT OF AVIATION
STATE AIRPORTS MANAGER
OFFICE 503-378-2523 **CELL** 503-302-5455
M-F 7:30am – 4pm

From: Wendie Kellington <wk@klgpc.com>
Sent: Monday, December 23, 2024 3:44 PM
To: THOMAS Alex R <Alex.R.THOMAS@odav.oregon.gov>; brandy.steffen@jla.us.com; BEACH Anthony <Anthony.BEACH@odav.oregon.gov>
Cc: Ted Millar <tmillar@wwpmi.com>; Tony Helbling - Wilson Construction Company (helbling@wilsonconst.com) <helbling@wilsonconst.com>; Rachel Bacon <rb@klgpc.com>; Aron Faegre (faegre@earthlink.net) <faegre@earthlink.net>; Senator Betsy Johnson - District 16 (betsy@betsyjohnson.com) <betsy@betsyjohnson.com>; Rachel Bacon <rb@klgpc.com>
Subject: 12.23 FINAL AAIA TLM LTR Preferred alternative

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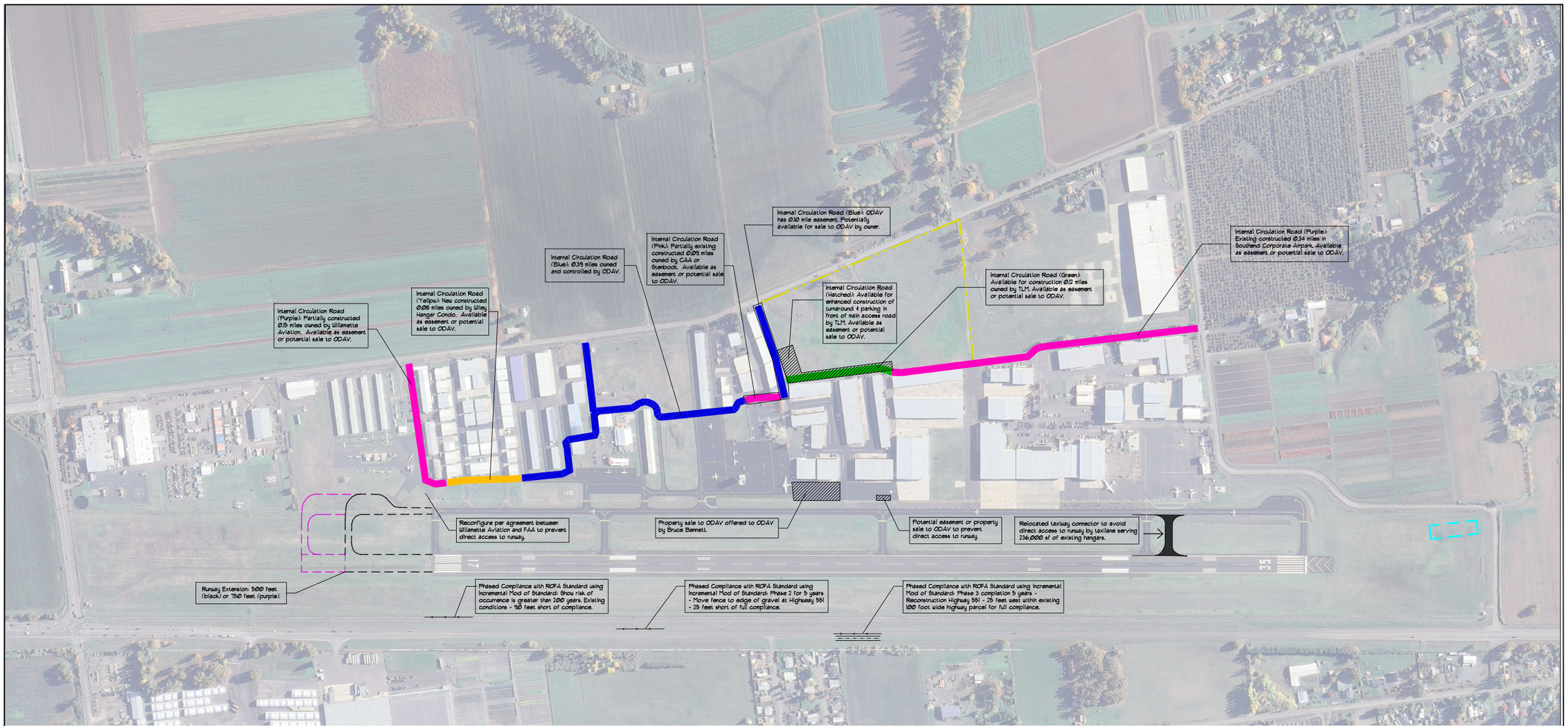
Good afternoon,

Attached please find for the record of the Aurora Airport Master Plan proceedings, the comment letter of AAIA and TLM Holdings, LLC, regarding ODAV's "Preferred Alternative." Please confirm receipt. Regards, Wendie Kellington

Wendie L. Kellington | Attorney at Law.
MAILING ADDRESS:
P.O. Box 2209
Lake Oswego, OR 97035
PHYSICAL ADDRESS
4500 Kruse Way, #340
Lake Oswego Or 97035
(503) 636-0069 office
(503) 636-0102 fax
wk@klgpc.com
www.wkellington.com

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1.

SITE PLAN

0 200 400 600

N

KEY

- AIRPORT BOUNDARY
- AIRPORT BOUNDARY ADDITION
- 500 FT RUNWAY EXTENSION
- 750 FT RUNWAY EXTENSION
- DRAINFIELD TO REMAIN WITH GEOTECH CERTIFICATION IN ACCORDANCE WITH WITH FAA SOIL STANDARDS

VERIFY SCALES

BAR IS ONE INCH ON ORIGINAL DRAWING. 0" 1"
IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY.

NO.	DATE	BY	APPR.	REVISIONS

AURORA AIRPORT IMPROVEMENT ASSOC.
PROPOSED ALTERNATIVE

DESIGNED BY:	DRAWN BY:	CHECKED BY:	SCALE:
AF	AF/JH	AF	300' = 1"

DATE: DECEMBER 23, 2024
PROJECT: MP – MASTERPLAN ALT AAIA

AURORA STATE AIRPORT (UAO)

AURORA STATE AIRPORT – MASTER PLAN ALTERNATIVE AAIA

DRAWING
MP–AAIA

Outlook

Fw: Objection to Proposed Hangar Demolition in Aurora Airport Master Plan

From Brandy Steffen <brandy.steffen@jla.us.com>
Date Tue 11/19/2024 4:16 PM
To Jen Winslow <Jen.winslow@jla.us.com>; Ashley Balsom <ashley.balsom@jla.us.com>

BRANDY STEFFEN | **JLA PUBLIC INVOLVEMENT**
Partner + Senior Program Manager
brandy.steffen@jla.us.com » Schedule a 30 minute meeting

From: BEACH Anthony <Anthony.BEACH@odav.oregon.gov>
Sent: Tuesday, November 12, 2024 6:09 AM
To: Samantha Peterson <SPeterson@CenturyWest.com>; Brandy Steffen <brandy.steffen@jla.us.com>
Cc: THOMAS Alex R <Alex.R.THOMAS@odav.oregon.gov>
Subject: FW: Objection to Proposed Hangar Demolition in Aurora Airport Master Plan

Good morning, please include in the record.

Thank you,

Tony Beach
OREGON DEPARTMENT OF AVIATION
STATE AIRPORTS MANAGER
OFFICE 503-378-2523 **CELL** 503-302-5455
M-F 7:30am – 4pm

From: BEACH Anthony
Sent: Tuesday, November 12, 2024 6:09 AM
To: Rick Farnbach <rick@farnbach.net>; THOMAS Alex R <Alex.R.THOMAS@odav.oregon.gov>
Subject: RE: Objection to Proposed Hangar Demolition in Aurora Airport Master Plan

Hi Rick, thank you for your comments, I have forwarded them to the master plan team and they'll be included in the record.

Tony Beach
OREGON DEPARTMENT OF AVIATION
STATE AIRPORTS MANAGER
OFFICE 503-378-2523 **CELL** 503-302-5455
M-F 7:30am – 4pm

From: Rick Farnbach <rick@farnbach.net>
Sent: Sunday, November 10, 2024 7:59 AM
To: BEACH Anthony <Anthony.BEACH@odav.oregon.gov>; THOMAS Alex R <Alex.R.THOMAS@odav.oregon.gov>
Subject: Objection to Proposed Hangar Demolition in Aurora Airport Master Plan

You don't often get email from rick@farnbach.net. Learn why this is important

This message was sent from outside the organization. Treat attachments, links and requests with caution. Be conscious of the information you share if you respond.

Dear Planning Committee,

I am writing to formally register my strong objection to any proposal in the Aurora Airport Master Plan that involves the demolition or "taking" of privately owned hangars at Aurora Airport.

There is already a significant shortage of hangars, and those identified for demolition currently support meaningful employment and contribute to our local economy. The reasons given for this proposed destruction—a vehicle lane set farther from the taxiway and a new parallel taxi lane—do not justify the loss of valuable hangar space. In fact, the same objectives could be met without hangar destruction, such as by purchasing a small additional parcel from a willing seller.

While I support efforts to improve airport safety, I firmly believe this can be achieved without demolishing any hangars.

Thank you for considering my concerns.

Sincerely,

Frederick Farnbach, CFI

11/10/24

Sent from my iPhone

Outlook

Fw: Public Comment on Aurora Airport Master Plan

From Brandy Steffen <brandy.steffen@jla.us.com>
Date Thu 12/19/2024 8:16 AM
To Jen Winslow <Jen.winslow@jla.us.com>; Ashley Balsom <ashley.balsom@jla.us.com>

BRANDY STEFFEN | **JLA PUBLIC INVOLVEMENT**
Senior Program Manager + Partner
She/Her » Why pronouns matter
brandy.steffen@jla.us.com » Office 503-235-5881 » jla.us.com
Meeting + email hours 9 a.m.–5 p.m. Monday–Thursday » Administrative-only hours Friday
Check my availability » Schedule a 30 minute check-in

JLA Public Involvement's mission: To create collaborative, meaningful and exceptionally effective public processes that lead to better, more inclusive outcomes.

I will be on vacation starting Monday, 12/23/24 and will return on Monday, 01/06/25.
JLA will be closed December 24 through January 1 to allow our entire team time to rest and recover. Please get in touch early with any anticipated needs during this time. Wishing you a lovely end to 2024!

From: THOMAS Alex R <Alex.R.THOMAS@odav.oregon.gov>
Sent: Wednesday, December 18, 2024 1:10 PM
To: Brandy Steffen <brandy.steffen@jla.us.com>; Samantha Peterson <SPeterson@CenturyWest.com>; BEACH Anthony <Anthony.BEACH@odav.oregon.gov>
Subject: FW: Public Comment on Aurora Airport Master Plan

Hello,

Good afternoon. Please include within the UAO record.

ALEX THOMAS
OREGON DEPARTMENT OF AVIATION (ODAV)
POLICY, PLANNING, & PROGRAMS MANAGER

CELL 971-375-2357

EMAIL Alex.R.Thomas@ODAV.Oregon.Gov

SALEM, OR 97302

WWW.OREGON.GOV/AVIATION

Schedule a meeting with me.

Schedule a meeting with any of the programs listed below.

Alternative Contacts:
COAR Grants: Grants@ODAV.Oregon.Gov
Procurement / Contracts: Contracts@ODAV.Oregon.Gov
Pavement (PEP/PMP): Pavement@ODAV.Oregon.Gov
Land Use / Tall Structure: LandUse@ODAV.Oregon.Gov

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From: Dan Fellin <dfellin@gmail.com>
Date: Wednesday, December 18, 2024 at 11:31
To: THOMAS Alex R <Alex.R.THOMAS@odav.oregon.gov>
Subject: Public Comment on Aurora Airport Master Plan

You don't often get email from dfellin@gmail.com. Learn why this is important

This message was sent from outside the organization. Treat attachments, links and requests with caution. Be conscious of the information you share if you respond.

Hi there! My name is Dan Felin.

I'm a pilot that's based out of UAO. My last flight from UAO was on 12-9-2024. I'd like to register a public comment on the Preliminary Alternatives I reviewed here:

https://publicproject.net/files/UAOAMP/uao-refined-preliminary-alternatives-summary-1-.pdf?d952c4adef=

> Extends Runway 497 feet north to a total length of 5,500 feet

An appropriate and helpful change!

> Includes a full length parallel taxilane and vehicle service road east of Taxiway A to address direct runway access and VPD issues

Based on my experience flying out of UAO, I personally don't see a need for a parallel taxilane / road. In practice, there is minimal conflict between ground vehicles and aircraft. They share the existing taxiway and ramp space quite well.

> South apron aeronautical properties are acquired, and hangars removed to accommodate parallel taxilane and vehicle service road

This change will negatively affect aviation and business operations at UAO. There is currently a critical shortage of hangar space at UAO.

It feels like the Preliminary Alternatives as currently written tries to solve a theoretical potential future issue (conflict between ground vehicles and aircraft) by exacerbating a concrete real actual issue (hangar shortage at UAO).

I respectfully suggest that ODAV first submits plans to construct hangars to the north and to lengthen the runway. After submitting those plans and monitoring how airport traffic and

business operations evolve, there can be an ongoing dialogue with the FAA as to when the implementation of the parallel taxiway + road might be appropriate.

Thank you for registering my public comments!

Cheers,
Dan Fellin

Outlook

Fw: Aurora Airport Master Plan

From Brandy Steffen <brandy.steffen@jla.us.com>
Date Mon 2025-01-06 3:43 PM
To Jen Winslow <Jen.winslow@jla.us.com>; Ashley Balsom <ashley.balsom@jla.us.com>

BRANDY STEFFEN | **JLA PUBLIC INVOLVEMENT**
Senior Program Manager + Partner
She/Her » Why pronouns matter
brandy.steffen@jla.us.com » Office 503-235-5881 » jla.us.com
Meeting + email hours 9 a.m.–5 p.m. Monday–Thursday » Administrative-only hours Friday
Check my availability » Schedule a 30 minute check-in

JLA Public Involvement's mission: To create collaborative, meaningful and exceptionally effective public processes that lead to better, more inclusive outcomes.

Please note: I will be on vacation, without access to my email, starting Friday, 01/24/25 and returning Monday, 02/03/25.

From: THOMAS Alex R <Alex.R.THOMAS@odav.oregon.gov>
Sent: Thursday, December 19, 2024 11:00 AM
To: Brandy Steffen <brandy.steffen@jla.us.com>; Samantha Peterson <SPeterson@CenturyWest.com>; BEACH Anthony <Anthony.BEACH@odav.oregon.gov>
Subject: FW: Aurora Airport Master Plan

Hello,

Good morning. Please include within the UAO record.

ALEX THOMAS
OREGON DEPARTMENT OF AVIATION (ODAV)
POLICY, PLANNING, & PROGRAMS MANAGER

CELL 971-375-2357
EMAIL Alex.R.Thomas@ODAV.Oregon.Gov
SALEM, OR 97302
WWW.OREGON.GOV/AVIATION

Schedule a meeting with me.

Schedule a meeting with any of the programs listed below.

Alternative Contacts:

COAR Grants: Grants@ODAV.Oregon.Gov
Procurement / Contracts: Contracts@ODAV.Oregon.Gov
Pavement (PEP/PMP): Pavement@ODAV.Oregon.Gov
Land Use / Tall Structure: LandUse@ODAV.Oregon.Gov

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From: Adrian Funnell <adrian28306@yahoo.com>
Date: Thursday, December 19, 2024 at 10:25
To: THOMAS Alex R <Alex.R.THOMAS@odav.oregon.gov>
Subject: Aurora Airport Master Plan

You don't often get email from adrian28306@yahoo.com. Learn why this is important

This message was sent from outside the organization. Treat attachments, links and requests with caution. Be conscious of the information you share if you respond.

Dear ODAV c/o Alex Thomas,

I am a pilot that flies out of KUAO and two other airports nearby.
Please register and record my urgent input for the Aurora Airport Master Plan not to consider the condemnation and destruction of any aircraft hangars.

Hangarage in this area is already scarce and therefore expensive, and aviation cannot survive without a stock of affordable hangars. Demolition of any hangars at Aurora State airport will add to what is already a big problem, and will have a far reaching economic impact.

Thank you

Adrian Funnell

Outlook

Fw: Notice of UAO Master Plan Discussion

From Brandy Steffen <brandy.steffen@jla.us.com>
Date Tue 11/19/2024 4:17 PM
To Jen Winslow <Jen.winslow@jla.us.com>; Ashley Balsom <ashley.balsom@jla.us.com>

BRANDY STEFFEN | **JLA PUBLIC INVOLVEMENT**
Partner + Senior Program Manager
brandy.steffen@jla.us.com » Schedule a 30 minute meeting

From: BEACH Anthony <Anthony.BEACH@odav.oregon.gov>
Sent: Friday, November 8, 2024 8:07 AM
To: Brandy Steffen <brandy.steffen@jla.us.com>; Samantha Peterson <SPeterson@CenturyWest.com>
Cc: THOMAS Alex R <Alex.R.THOMAS@odav.oregon.gov>
Subject: FW: Notice of UAO Master Plan Discussion

Please include in the public record.

Thanks,

Tony Beach
OREGON DEPARTMENT OF AVIATION
STATE AIRPORTS MANAGER
OFFICE 503-378-2523 **CELL** 503-302-5455
M-F 7:30am – 4pm

From: GRAUPP Bill (Avi Board) <Bill.GRAUPP@odav.oregon.gov>
Sent: Tuesday, November 5, 2024 9:14 PM
To: SUGAHARA Kenji <Kenji.SUGAHARA@odav.oregon.gov>; THOMAS Alex R <Alex.R.THOMAS@odav.oregon.gov>; BEACH Anthony <Anthony.BEACH@odav.oregon.gov>
Subject: Notice of UAO Master Plan Discussion

Hi,

At the Aurora Planning Commission meeting (11/5/2024, 7-8PM), the UAO Master Plan was discussed by Chair Schafer. I did some additional comments to prevent mis-conceptions in some of the statements, primarily about property acquisition.

Also on 10/27/2024 12:30PM, I had lunch with Bruce Bennett (UAO Property owner) at the SLE airport at the Flight Deck where the UAO Master Plan was a topic of discussion as well as the comments made by former Sen Betsy Johnson the previous Thursday at the CAA Meeting.

Thanks, Bill

Aeros Jet Aviation, Inc.
Aurora State Airport, Aurora, Oregon

September 3, 2024

Brandy Steffen,
JLA Public Involvement
Tony Beach, ODAV
Alex Thomas, ODAV
Samantha Peterson
Century West

RE: Comments on July 30, 2024 Aurora Master Plan Alternatives

Ladies and Gentlemen,

This letter is written on behalf of the direct airport stakeholders whose aviation related businesses are located at, and rely upon, the Aurora Airport. Please include this letter in the record of the 2023-2024 Aurora Airport Master Plan proceedings.

On July 30, 2024, the Oregon Department of Aviation (ODAV) presented three alternatives for the development of the Aurora Airport for the next 20 years and invited comment on those alternatives. **The direct airport stakeholders strongly OBJECT to all of those proposed alternatives: 1A, 1B and 2.**

Objection to Process

At the July 30, 2024 meeting, PAC members were invited to comment on the proposed alternatives via checking a box on an online form to identify which of ODAV's three alternatives they preferred. Participants had no way to offer meaningful comments or explain why none of the alternatives were acceptable. The undersigned strongly objects to ODAV's process as it is not reasonably calculated to solicit input from stakeholders as required by federal law to determine a preferred alternative. Reserving that objection, the Aurora Airport direct airport stakeholders present the following comments on the July 30, 2024 ODAV proposed master plan alternatives.

General Objection – the Alternatives Present a False Choice: Sacrifice the Safety of the Aurora Airport in the Name of Safety

Under ODAV's "alternatives" the runway extension that is well-documented to be badly needed now for safety, is held hostage to prerequisites that will take a decade or more (if they can even happen at all) and hundreds of millions of dollars that no one has. In other words, ODAV's alternatives ensure that the runway safety improvement will never happen or will happen only if the airport is less safe, all in service of perfect prerequisite compliance with design standards. This is a false choice and one that the FAA does not and in fact cannot demand and ODAV should not demand this false choice either. The false choice is not only contrary to the very purposes of aviation master planning and federal law but also ORS 836.600-642 and ODAV's mission.

Alternatives Proceed from False Assumptions

For the alternatives to have legitimacy, they must proceed from accurate assumptions. The proposed alternatives do not proceed from accurate assumptions. To the contrary, each of the three proposed alternatives proceed from false premises.

The first false assumption is that the FAA will not allow the airport to "maintain current non-standard conditions" and if the airport has any "non-standard conditions," then the FAA will place the runway "in maintenance only mode ***."[1]

The second false ODAV assumption is that it is necessary for ODAV to acquire the privately owned "through the fence" properties adjacent to the airport "to ensure [their] continued long-term aeronautical use."

---

[1] ODAV July 30, 2024 PPT Presentation to Planning Advisory Committee. This erroneous assumption carries forward to the August 1, 2024 "Refined Preliminary Alternatives Analysis" which similarly begins by asserting that ODAV has "recognized that maintaining current non-standard conditions is not acceptable to the Federal Aviation Administration (FAA)." There is no such lawful FAA position that ODAV may "recognize." To the extent that ODAV has adopted such a "recognition" it is contrary to both federal and state law and may not serve as the foundation for the airport's 20-year future.

Starting with the second false assumption, we note that there is nothing to support the assumption that if ODAV owned the undersigned's private aviation related properties they would be bettered assured to remain in aeronautical use. Respectfully, there are a lot of reasons to believe ODAV ownership of our property would have a contrary result. It is we, the private through the fence owners, who have the strong incentive to maintain robust aviation use of our adjacent private property because it is suitable for no economic use other than aeronautical use and we have invested and continue to invest ***millions of dollars*** to assure the success of our aviation related uses there.

Conversely, we have not seen evidence that ODAV is committed to growing and supporting aeronautical use of our properties at the Aurora Airport. We have pushed for more than a decade for ODAV to remove trees that are a hazard to aviation. ODAV hasn't gotten around to doing that. We have pushed for decades for ODAV to extend the airport's runway for safety, but ODAV hasn't gotten around to doing that, despite the runway extension being approved on the 2012 airport ALP. ODAV told the airport's opponent's that the 2012 airport master plan had not been finally adopted when ODAV had clearly adopted it (otherwise there would have been no 2012 ALP), inviting years of litigation that resulted in a remand of the 2012 master plan on land use grounds. ODAV did not bother to respond to that remand of the 2012 master plan, as it should have.

With all respect, the only evidence is that the private through the fence owners have the great documented interest in the continued aeronautical use of their property – they (we) have invested millions of dollars to support aviation use at the Aurora Airport and we continue to do so, our properties are useful for nothing but aviation related use in fact. There is simply nothing to support ODAV's "assumption" that ODAV needs to buy our property to ensure its continued aeronautical use. We note that this second premise is also contrary to the legislative command in ORS 836.640-642 that ODAV **support** the private through the fence ownerships and their economic development, not buy them out. ODAV is constrained by this legislative command. The second "assumption" is simply a nonstarter.

With respect to the first erroneous assumption, the assumption's referenced "non-standard conditions" are primarily the Runway Object Free Area (ROFA) required separation for C-II design aircraft between the runway and Highway 551. [2] The law does not support ODAV's first erroneous premise that the FAA always requires that airports meet all design standards. The law and FAA's decades of practice is exactly the opposite.

In this regard, federal law expressly provides FAA with authority to issue modifications to standards "when necessary to meet local conditions" so long as the "modification will provide an acceptable level of safety, economy, durability and workmanship." 14 CFR 152.11(b). FAA staff lack authority to override that federal law that recognizes that "non-standard conditions" happen and can be allowed to continue in the right circumstances, as presented here.

The truth is that FAA routinely approves modifications to standards where the modification provides the requisite "acceptable level of safety." FAA has approved modifications at airports from Renton where 737's takeoff and land daily at a B-II airport, to SJC which has modifications to standards for many FAA requirements. This happens frequently enough that, as required by Congress, FAA in conjunction with the National Transportation Research Board and National Academies of Sciences, published a technical handbook entitled "**Risk Assessment Method to Support Modification of Airfield Separation Standards"** that goes to a lot of trouble to explain exactly how to assess whether a modification to an airport design standard will provide an acceptable level of safety. Contrary to the July 30 ODAV "assumptions" and August 1 ODAV "recognition",

---

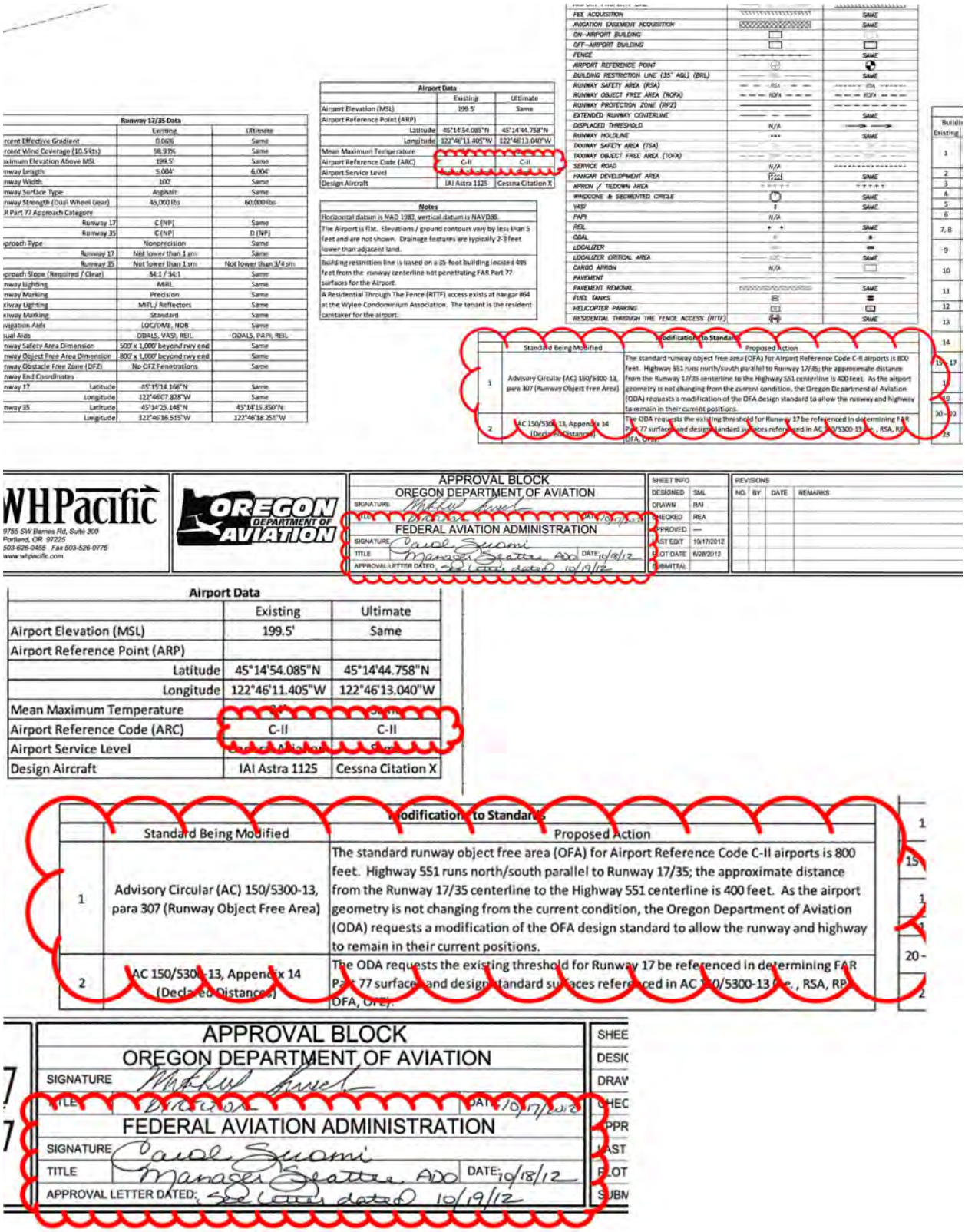
[2] ODAV's "alternatives" assume another "non-standard" condition regarding the location of the airport's septic drainfields in the north and south. The septic drainfield in the south was expressly approved by ODAV, FAA and Marion County in a land use process. It is not "non-standard" or if it is, it is already approved – by ODAV and FAA. Moreover, if necessary, those drainfields can be brought to whatever standard applies. But ODAV may not merely assume they are "non-standard", say they will be "removed" in all alternatives but have no other location for them and no analysis of whether it is feasible to establish any alternative location for them. If ODAV's unstated plan is just to annex the airport to the 900-population City of Auora that has done nothing but oppose the airport for the past decade, and that had a mayor who we understand to be on record saying the city wanted to annex the airport to shut it down, the private airport stakeholders strongly oppose any such -as yet – unarticulated plan.

this federal risk assessment publication states that "**FAA does accept requests from airports for modifications to standards**."

Following federal law and the FAA Risk Assessment publication, respected airport planner, Aron Faegre prepared such an analysis under the FAA published risk-assessment methodology that **concludes maintaining the existing ROFA between the runway and Highway 551 provides an acceptable level of safety.** In other words, were ODAV to merely ask (and Mr. Faegre has done the work to support that), a modification to the ROFA would be granted. Which means contrary to ODAV's "assumptions" underpinning the three alternatives that ODAV revealed on July 30, 2024, the FAA would approve maintaining the existing non-standard conditions at the airport. This should not be a surprise because the FAA approved the exact ROFA modification for a C-II design aircraft that Mr. Faegre demonstrates meets modification standards, when it approved the 2012 ALP for the airport.

FAA Approved the Modification for the ROFA - Separation of the Runway to Highway 551 – in the 2012 ALP under Airport Design Standards for a C-II Airport

The approved ALP that currently governs the airport shows that the FAA approved the runway extension to the south with a ROFA modification to standards for the C-II design aircraft for the separation between the runway and Highway 551.



Runway 17/35 Data

	Existing	Ultimate
rcent Effective Gradient	0.06%	Same
rcent Wind Coverage (10.5 kts)	98.93%	Same
aximum Elevation Above MSL	199.5'	Same
nway Length	5,004'	6,004'
nway Width	100'	Same
nway Surface Type	Asphalt	Same
nway Strength (Dual Wheel Gear)	45,000 lbs	60,000 lbs
R Part 77 Approach Category		
Runway 17	C (NP)	Same
Runway 35	C (NP)	D (NP)
proach Type	Nonprecision	Same
Runway 17	Not lower than 1 sm	Same
Runway 35	Not lower than 1 sm	Not lower than 3/4 sm
proach Slope (Required / Clear)	34:1 / 34:1	Same
nway Lighting	MIRL	Same
nway Marking	Precision	Same
xiway Lighting	MITL / Reflectors	Same
xiway Marking	Standard	Same
vigation Aids	LOC/DME, NDB	Same
ual Aids	ODALS, VASI, REIL	ODALS, PAPI, REIL
nway Safety Area Dimension	500' x 1,000' beyond rwy end	Same
nway Object Free Area Dimension	800' x 1,000' beyond rwy end	Same
nway Obstacle Free Zone (OFZ)	No OFZ Penetrations	Same
nway End Coordinates		
nway 17 Latitude	45°15'14.166"N	Same
Longitude	122°46'07.828"W	Same
nway 35 Latitude	45°14'25.148"N	45°14'15.350"N
Longitude	122°46'16.515"W	122°46'18.251"W

Airport Data

	Existing	Ultimate
Airport Elevation (MSL)	199.5'	Same
Airport Reference Point (ARP)		
Latitude	45°14'54.085"N	45°14'44.758"N
Longitude	122°46'11.405"W	122°46'13.040"W
Mean Maximum Temperature	84°	84°
Airport Reference Code (ARC)	C-II	C-II
Airport Service Level	Corporate/Medium	Same
Design Aircraft	IAI Astra 1125	Cessna Citation X

Notes

Horizontal datum is NAD 1983, vertical datum is NAVD88.

The Airport is flat. Elevations / ground contours vary by less than 5 feet and are not shown. Drainage features are typically 2-3 feet lower than adjacent land.

Building restriction line is based on a 35-foot building located 495 feet from the runway centerline not penetrating FAR Part 77 surfaces for the Airport.

A Residential Through The Fence (RTTF) access exists at hangar #64 at the Wylee Condominium Association. The tenant is the resident caretaker for the airport.

FEE ACQUISITION	SAME
AVIGATION EASEMENT ACQUISITION	SAME
ON-AIRPORT BUILDING	
OFF-AIRPORT BUILDING	
FENCE	SAME
AIRPORT REFERENCE POINT	
BUILDING RESTRICTION LINE (35' AGL) (BRL)	SAME
RUNWAY SAFETY AREA (RSA)	RSA
RUNWAY OBJECT FREE AREA (ROFA)	ROFA
RUNWAY PROTECTION ZONE (RPZ)	
EXTENDED RUNWAY CENTERLINE	SAME
DISPLACED THRESHOLD	N/A
RUNWAY HOLDLINE	SAME
TAXIWAY SAFETY AREA (TSA)	
TAXIWAY OBJECT FREE AREA (TOFA)	
SERVICE ROAD	N/A
HANGAR DEVELOPMENT AREA	SAME
APRON / TIEDOWN AREA	
WINDCONE & SEGMENTED CIRCLE	SAME
VASI	SAME
PAPI	N/A
REIL	SAME
ODAL	
LOCALIZER	
LOCALIZER CRITICAL AREA	SAME
CARGO APRON	N/A
PAVEMENT	
PAVEMENT REMOVAL	SAME
FUEL TANKS	
HELICOPTER PARKING	
RESIDENTIAL THROUGH THE FENCE ACCESS (RTTF)	SAME

Modification to Standards

	Standard Being Modified	Proposed Action
1	Advisory Circular (AC) 150/5300-13, para 307 (Runway Object Free Area)	The standard runway object free area (OFA) for Airport Reference Code C-II airports is 800 feet. Highway 551 runs north/south parallel to Runway 17/35; the approximate distance from the Runway 17/35 centerline to the Highway 551 centerline is 400 feet. As the airport geometry is not changing from the current condition, the Oregon Department of Aviation (ODA) requests a modification of the OFA design standard to allow the runway and highway to remain in their current positions.
2	AC 150/5300-13, Appendix 14 (Declared Distances)	The ODA requests the existing threshold for Runway 17 be referenced in determining FAR Part 77 surfaces and design standard surfaces referenced in AC 150/5300-13 (i.e., RSA, RPZ, OFA, OFZ).

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OREGON DEPARTMENT OF AVIATION

APPROVAL BLOCK
OREGON DEPARTMENT OF AVIATION
SIGNATURE: Mike Fuller
TITLE: Director DATE: 10/17/2012
FEDERAL AVIATION ADMINISTRATION
SIGNATURE: Carol Suomi
TITLE: Manager, Seattle ADO DATE: 10/18/12
APPROVAL LETTER DATED: see letter dated 10/19/12

SHEET INFO
DESIGNED SML
DRAWN RAI
CHECKED REA
APPROVED —
LAST EDIT 10/17/2012
PLOT DATE 6/28/2012
SUBMITTAL

REVISIONS

NO.	BY	DATE	REMARKS

That means there is no reason to think that the same ROFA modification to standards cannot be approved here. ODAV should apply for it and the FAA almost certainly will grant it.

Proper Assumptions for this Master Planning Effort

With all due respect, there are proper assumptions for this master planning effort. The direct airport stakeholders urge ODAV to adopt the following assumptions and goals for the Aurora Airport Master Plan:

- ODAV can and should apply for modifications to C-II design standards for existing conditions at the airport that would otherwise require unachievable prerequisites to the runway extension.
- ODAV should grow and support the through the fence aviation operations as it is instructed to do in ORS 836.640-642. Accordingly, ODAV should expand the airport boundary to enable the last undeveloped through the fence areas shown on the draft master plan to grow and flourish.
- ODAV has an obligation to manage the Aurora Airport to safely support the general aviation that has grown to rely upon it and the Oregonians who rely upon that general aviation.
- ODAV should support the Aurora Airport as an economic powerhouse for the region being responsible for thousands of jobs and millions of dollars in payroll and visitor spending.
- ODAV should support the Aurora Airport that is known to be a resiliency center in the event of natural disasters – whether they be wildfire disasters or the Cascadia Subduction Event.
- ODAV should support the Aurora Airport that is home to Life Flight that provides important air ambulance service to needy Oregonians and delivers organs for transplant that saves lives.
- To the extent ODAV is privately planning otherwise, ODAV should strongly resist efforts by opponent municipalities like the city of Aurora to annex the airport.
- The airport should not be casually discarded to the bin of unachievable prerequisites.

Alternative that ODAV Should Consider

A wholly achievable alternative that is consistent with the FAA and state law that ODAV should consider is:

a. a 500' runway extension to the north; better yet a 750' runway extension to the north. 750' is well-understood to be better and more appropriate for the long master planning horizon

b. Reapproval for the necessary existing modification to standards for existing conditions

c. Adjust the airport boundary to include the undeveloped through the fence areas on the current draft

d. Show the Internal Circulation Road location that was shown on the 2012 ALP

Conclusion

The direct airport stakeholders stand ready to work cooperatively with ODAV toward an appropriate 20-year master plan for the Aurora Airport along the lines of the alternative that we outline above. However, respectfully, we cannot abide any of the July 30, 2024 proposed alternatives and strongly oppose all of them. We hope that ODAV will agree that the assumptions and alternative proposed by the direct airport stakeholders are appropriate ones that ODAV should adopt in support of general aviation at the airport, regional disaster resilience and economic vitality for the decades to come. The future of aviation at the Aurora Airport depends upon it.

Thank you for your consideration.

Sincerely,

William R. Granewich

William R. Granewich
Aeros Jet Aviation, Inc.

CC: Kenji Sugahara, Director, ODAV
Brad Schuster, AOPA
Edward M. Bolen, NBAA

Outlook

Re: Aurora Airport project

From Brandy Steffen <brandy.steffen@jla.us.com>
Date Mon 6/17/2024 3:52 PM
To Don Hardy <HardyD@canbyoregon.gov>; Emily Sasse <SasseE@canbyoregon.gov>
Cc BEACH Anthony <Anthony.BEACH@odav.oregon.gov>; THOMAS Alex R <Alex.R.THOMAS@odav.oregon.gov>; Jen Winslow <Jen.winslow@jla.us.com>; Jamie Stickel <StickelJ@canbyoregon.gov>; Eileen Stein <steine@canbyoregon.gov>

Thanks so much Don.

I also spoke with Eileen today about the project. I would recommend that you all watch the video from the last PAC, if you haven't already done so, where the preliminary alternatives are explained (https://publicproject.net/AuroraAirport# on the meetings page) and then provide feedback via the form (in my previous email). Hopefully you can also attend our working session on 7/30.

Good luck with the comp plan, TSP and UGB updates! That is a lot at one time. Please let us know if you have any questions about the Aurora Airport project; we just wanted to make sure you're aware of what is happening.

Thanks,
Brandy

BRANDY STEFFEN | **JLA PUBLIC INVOLVEMENT**
brandy.steffen@jla.us.com » 503-235-5881 » jla.us.com
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Check my availability » Schedule a 30 minute check-in

From: Don Hardy <HardyD@canbyoregon.gov>
Sent: Thursday, June 13, 2024 9:35 PM
To: Brandy Steffen <brandy.steffen@jla.us.com>; Emily Sasse <SasseE@canbyoregon.gov>
Cc: BEACH Anthony <Anthony.BEACH@odav.oregon.gov>; THOMAS Alex R <Alex.R.THOMAS@odav.oregon.gov>; Jen Winslow <Jen.winslow@jla.us.com>; Jamie Stickel <StickelJ@canbyoregon.gov>
Subject: RE: Aurora Airport project

Hi Brandy,

Thank you for your email and invite to the open house. Unfortunately, we were not able to attend.

I reached out to Jamie Stickel our Economic Development Director, and she is interested in the advisory committee, and I've cc'd her. She has been tracking the Aurora Airport issues and will spend some time looking at the master plan.

We are in the middle of a comprehensive plan, transportation system plan and urban growth boundary process and updating all of our housing policies and Jamie has been involved in all of these. We had three meetings on these this week, lots going on in Canby.

Don

From: Brandy Steffen <brandy.steffen@jla.us.com>
Sent: Monday, June 10, 2024 12:02 PM
To: Don Hardy <HardyD@canbyoregon.gov>; Emily Sasse <SasseE@canbyoregon.gov>
Cc: BEACH Anthony <Anthony.BEACH@odav.oregon.gov>; THOMAS Alex R <Alex.R.THOMAS@odav.oregon.gov>; Jen Winslow <Jen.winslow@jla.us.com>
Subject: Aurora Airport project
Importance: High

Some people who received this message don't often get email from brandy.steffen@jla.us.com. Learn why this is important

Hi Don and Emily,

I wanted to reach out to you to make sure you're aware of the current Airport Master Plan taking place at the Aurora Airport (https://publicproject.net/AuroraAirport).

We don't currently have anyone representing Canby on the Project Advisory Committee and are wondering if you all are interested. I believe that Alex with ODAV has reached out but not heard from anyone, so if you're not the right people, please let me know.

Additionally, we have a public open house this Thursday where you can learn more about the project.

Finally, I'm open to chat about this anytime. Please reach out via email or schedule a time to chat using the link in my email signature below.

Thanks,
Brandy

BRANDY STEFFEN | **JLA PUBLIC INVOLVEMENT**
Strategist + Partner
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Email is the best way to reach me; I try to respond within 1 workday.

Outlook

Fwd: Aurora Airport - June 11 PAC meeting and June 13 open house

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From Brandy Steffen <brandy.steffen@jla.us.com>
Date Tue 5/14/2024 2:53 PM
To Jen Winslow <Jen.winslow@jla.us.com>; Samantha Peterson <SPeterson@CenturyWest.com>; W. Matt Rogers <WRogers@CenturyWest.com>

Here's another comment that will be added to the summary...

Thanks,

BRANDY STEFFEN | JLA PUBLIC INVOLVEMENT

Senior Program Manager + Partner

She/Her » Why pronouns matter

brandy.steffen@jla.us.com » Office 503-235-5881 » jla.us.com

Meeting + email hours 9 a.m.–5 p.m. Monday–Thursday » Administrative-only hours Friday

Check my availability » Schedule a 30 minute check-in » Email is the best way to reach me; I try to respond within 3 full workdays.

JLA Public Involvement's mission: To create collaborative, meaningful and exceptionally effective public processes that lead to better, more inclusive outcomes.

From: Helbling, Tony <helbling@wilsonconst.com>
Sent: Tuesday, May 14, 2024 2:36:00 PM
To: Brandy Steffen <brandy.steffen@jla.us.com>
Cc: Ted Millar <tmillar@wwpmi.com>; Bruce Bennett <bruce@auroraaviation.com>; David Waggoner <dave@WillametteAir.com>; Kurt Wilson <kurtwilson@comcast.net>; Trent Brownlee <trent.brownlee@atlanticaviation.com>; BEACH Anthony <Anthony.BEACH@odav.oregon.gov>; SUGAHARA Kenji <Kenji.SUGAHARA@odav.oregon.gov>
Subject: RE: Aurora Airport - June 11 PAC meeting and June 13 open house

Brandy –

Trying to get this in under the wire for today's deadline for response to last meeting. Accelerate/Stop distance for the design class is 5500'.
Couple things…

We feel the 5500' number is predicated on a "uncontaminated runway" = dry runway, and pilots perform with exact precision. It rains A LOT here in Oregon… most of the year. Add in human factors and that 5500' number is a very tight limitation. Thinking 6000' (as has historically been called out in past master plans over the past 45+ years), gives a better margin for safety.

We agree the FAA may recognize the design class/category is based on specific example models of aircraft. We want it noted that most of those aircraft are aging aircraft (15 to 20 years old) and will age more before this runway is extended (5 years? So 20 to 25 year old airframes). Most newer aircraft in the design class are up against that 5500' number and we predict future (quieter) aircraft could exceed it.

As we look to the future of the airport, it only makes sense to plan the investment wisely to include a margin of safety. In the grand scheme of things, the return on investment will be human lives.

Tony Helbling
Logistics Manager
Wilson Construction Company
1190 NW 3rd Ave
Canby, OR 97013
Cell: 503-519-6059
Office: 503-263-6882
helbling@wilsonconst.com
www.wilsonconst.com

From: Brandy Steffen <brandy.steffen@jla.us.com>
Sent: Thursday, May 09, 2024 3:54 PM
To: Brandy Steffen <brandy.steffen@jla.us.com>
Subject: Aurora Airport - June 11 PAC meeting and June 13 open house

You don't often get email from brandy.steffen@jla.us.com. Learn why this is important

Hello PAC members,

We are looking forward to seeing you at the **next meeting (VIRTUAL) on Tuesday, June 11, 2024 from 5:00-8:00 p.m.** *(please note this is an hour longer than our normal meeting time).*

The recording from our last meeting (April 30) is posted on the project website and **we would like comments back from you for inclusion in the meeting summary by next Tuesday, May 14.**

Date/Time: Tuesday, June 11, 2024 from 5:00-8:00 p.m.
Topic: The preliminary alternatives will be presented for the Aurora State Airport Master Plan.
Location: Zoom

- PAC members have been registered via Zoom and will get an email directly from Zoom with the login information (please check your junk folder). Please do not forward this email to anyone.

- Others can register for the meeting under their own names at: Webinar Registration - Zoom

Materials: Just a reminder that meeting materials will be posted on the website:
https://publicproject.net/AuroraAirport#

Additionally, we want to announce and invite you to our next public open house, which will be held in-person. We hope to see you there.

Thursday, June 13, 2024
Drop by between 4:00-7:00 pm
North Marion High School, Commons
(20167 Grim Rd NE, Aurora, OR 97002)

Light refreshments provided; children welcome
Tendremos interpretación en español en la reunión. We will have Spanish interpretation at the meeting.

This meeting provided an opportunity for the neighbors, PAC members, and other interested community members to learn about the Airport Master Plan project. This meeting will present the preliminary alternatives for the Aurora State Airport Master Plan. All written and verbal comments collected during the open house will be included in the event Summary.

Thank you again for your continued interest in, and participation with, the Aurora Airport Master Plan project.
Brandy

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Check my availability » Schedule a 30 minute check-in

Outlook

Re: PAC Question

From Brandy Steffen <brandy.steffen@jla.us.com>
Date Wed 8/28/2024 10:28 AM
To Helbling, Tony <helbling@wilsonconst.com>; BEACH Anthony <Anthony.BEACH@odav.oregon.gov>

1 attachment (98 KB)
Potential for MOS related to runway extensions at UAO.eml;

Hi Tony,

I know you've been speaking to ODAV and FAA separately but I want to make sure that we close the loop on these two questions. We'll also include these questions on the website's "frequently asked questions" section. The feedback form is up until September 3, so feel free to send additional comments through that form or directly to me.

1. We'd like to know who in the FAA stated "Maintaining current non-standard conditions is not acceptable to the FAA" – please send contact info and/or docs to support that claim.
    a. Tim House, FAA Community Planner has coordinated with FAA, ADO and Regional Level Management and they have indicated that a modification of standards (MOS) would not be supported by FAA until the ROFA and RSA standards are met. This is acknowledged in an email from FAA on March 26, 2024 (*attached*). The Planning Team has asked FAA to provide additional information that can be shared with the PAC.
2. What FAA regulation is cited for "Runway may be placed in maintenance only mode by FAA until progress is made toward meeting design standards" – could you send any or sort of memo or guidance quoted that would put KUAO into "maintenance mode only"? We've never heard of this "mode".
    a. There is no formal "maintenance mode" description by FAA that can be provided. The term is often used to describe airports that do not meet standards; whereas FAA advises the airport sponsor that only maintenance projects and projects that bring the airport up-to standards would be funded. Maintenance projects include, but are not limited to, crack fill, sealcoat, and pavement overlays. Pavement reconstruction is not considered maintenance and would be in-eligible unless standards are met.

Thanks,
Brandy

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Check my availability » Schedule a 30 minute check-in
Email is the best way to reach me; I try to respond within 2 workdays.
However, urgent requests should be handled through a phone call or scheduling a meeting using the link above.

From: Helbling, Tony <helbling@wilsonconst.com>
Sent: Tuesday, August 13, 2024 11:46 AM

To: BEACH Anthony <Anthony.BEACH@odav.oregon.gov>; Brandy Steffen <brandy.steffen@jla.us.com>

Subject: PAC Question

Not sure who to ask so will start with you two… need answers BEFORE we can submit our comments by the August 20 deadline to submit comments!

2 questions referencing the slides from

1. We'd like to know who in the FAA stated "Maintaining current non-standard conditions is not acceptable to the FAA" – please send contact info and/or docs to support that claim.
2. What FAA regulation is cited for "Runway may be placed in maintenance only mode by FAA until progress is made toward meeting design standards" – could you send any or sort of memo or guidance quoted that would put KUAO into "maintenance mode only"? We've never heard of this "mode".

Tony Helbling
Logistics Manager
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Cell: 503-519-6059
Office: 503-263-6882
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Outlook

Fw: Extension request

From Brandy Steffen <brandy.steffen@jla.us.com>
Date Wed 8/28/2024 2:08 PM
To Jen Winslow <Jen.winslow@jla.us.com>

FYI

Thanks,
Brandy

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Check my availability » Schedule a 30 minute check-in
Email is the best way to reach me; I try to respond within 2 workdays.
However, urgent requests should be handled through a phone call or scheduling a meeting using the link above.

From: BEACH Anthony <Anthony.BEACH@odav.oregon.gov>
Sent: Wednesday, August 14, 2024 5:05 PM
To: Samantha Peterson <SPeterson@CenturyWest.com>; W. Matt Rogers <WRogers@CenturyWest.com>; Brandy Steffen <brandy.steffen@jla.us.com>
Cc: THOMAS Alex R <Alex.R.THOMAS@odav.oregon.gov>
Subject: FW: Extension request

FYI, let's discuss.

Tony Beach
OREGON DEPARTMENT OF AVIATION
STATE AIRPORTS MANAGER
OFFICE 503-378-2523 CELL 503-302-5455
M-F 7:30am - 4pm

-----Original Message-----
From: Helbling, Tony <helbling@wilsonconst.com>
Sent: Wednesday, August 14, 2024 4:27 PM
To: BEACH Anthony <Anthony.BEACH@odav.oregon.gov>
Subject: Extension request

This message was sent from outside the organization. Treat attachments, links and requests with caution. Be conscious of the information you share if you respond.

As per conversation today we are asking for a 30 day extension to the August 20 deadline for comments to the presented alternative at the July 30 meeting we feel this is too short of fuse for us to adequately respond additionally we still want answers to the basis of the assumptions ODAV made or the consultant made for the alternatives

Tony Helbling Logistics Manager Wilson Construction Co. Sent from my iPhone: (503) 519-6059

Outlook

Fw: Extension Request

From Brandy Steffen <brandy.steffen@jla.us.com>
Date Wed 8/28/2024 1:27 PM
To Jen Winslow <Jen.winslow@jla.us.com>

1 attachment (5 MB)
AIP-Handbook-Order-5100-38D-Chg1.pdf;

FYI

Thanks,
Brandy

BRANDY STEFFEN | **JLA PUBLIC INVOLVEMENT**
Strategist + Partner
She/Her » Why pronouns matter
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Woman-led, community-centered, for 35 years and counting

Meeting + email hours 9 a.m.–5 p.m. Monday–Thursday. Administrative-only hours on Friday.
Check my availability » Schedule a 30 minute check-in
Email is the best way to reach me; I try to respond within 2 workdays.
However, urgent requests should be handled through a phone call or scheduling a meeting using the link above.

From: BEACH Anthony <Anthony.BEACH@odav.oregon.gov>
Sent: Monday, August 26, 2024 3:11 AM
To: Samantha Peterson <SPeterson@CenturyWest.com>; W. Matt Rogers <WRogers@CenturyWest.com>
Cc: Brandy Steffen <brandy.steffen@jla.us.com>; THOMAS Alex R <Alex.R.THOMAS@odav.oregon.gov>
Subject: FW: Extension Request

FYI

Tony Beach
OREGON DEPARTMENT OF AVIATION
STATE AIRPORTS MANAGER
OFFICE 503-378-2523 **CELL** 503-302-5455
M-F 7:30am – 4pm

From: House, Timothy A (FAA) <Timothy.A.House@faa.gov>
Sent: Thursday, August 15, 2024 5:46 PM
To: Helbling, Tony <helbling@wilsonconst.com>
Cc: BEACH Anthony <Anthony.BEACH@odav.oregon.gov>; Zulauf, Ryan C (FAA) <ryan.c.zulauf@faa.gov>
Subject: RE: Extension Request

This message was sent from outside the organization. Treat attachments, links and requests with caution. Be conscious of the information you share if you respond.

Thank for the message Tony. I appreciate your call yesterday, conversation today and your time assisting the Master Plan effort by serving on the PAC.

I did pull up the AIP handbook after we talked and found the specific passage that controls our AIP funding in these situations. The following section speaks to the issue. I have included a copy of the full AIP handbook for your use.

> **3-23. Modification to FAA Standards (or Specifications).**
>
> Where the FAA has published specifications for specific items, it is FAA policy that sponsors must use the specifications as written, with no changes from the specifications, except where explicitly allowed in the specification.
>
> The sponsor must obtain an FAA modification to standards approval for any change that is not specifically allowed, no matter how minor it may seem to the sponsor. This is necessary to ensure an acceptable level of safety, capacity, efficiency, utility or access. Additionally, the FAA review will ensure the proposed modification will not unduly limit competition, eliminate FAA approved vendors, compromise statutory or regulatory requirements, or negatively impact the project.
>
> For AIP funding purposes, some modifications to FAA standards (such as those examples in Table 3-16) will not be considered because they violate 2 CFR part 200 or deviate from FAA design standards. The ADO or AAS-100 must not approve such requests for AIP funded projects. However, in the event of a pre-existing nonstandard airfield configuration, AIP funds may only be used to rehabilitate or reconstruct the affected airfield element if FAA has formally approved a modification to standards or the airfield element is brought up to standards.
>
> The current version of FAA Order 5300.1, Modifications to Agency Airport Design, Construction, and Equipment Standards contains the requirements for modification to standards.

After reading your message to Tony below and seeing the "maintenance mode", I think this requirement related to Modification to FAA Standards is what they were referring to. Because if you can't do rehab and reconstruction then all that is left is maintenance. This is what we have been talking about with ODAV and the planners.

Tim A. House
Lead Planner, SEA Airports District Office
FAA Northwest Mountain Region
206-231-4248
405-607-9949 (mobile)

World leaders in creating a safe and efficient system of airports!
We value Integrity, Collaboration and Innovation

From: Helbling, Tony <helbling@wilsonconst.com>
Sent: Thursday, August 15, 2024 4:15 PM
To: House, Timothy A (FAA) <Timothy.A.House@faa.gov>
Subject: FW: Extension Request

CAUTION: This email originated from outside of the Federal Aviation Administration (FAA). Do not click on links or open attachments unless you recognize the sender and know the content is safe.

Tim,

Thanks so much for the call back today. Appreciate the advice on finding the AIP stuff – will search out that info – if you have a fast reference – would appreciate anything you could send.

Start at the bottom and read up….

Tony Helbling
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From: BEACH Anthony <Anthony.BEACH@odav.oregon.gov>
Sent: Thursday, August 15, 2024 4:05 PM
To: Helbling, Tony <helbling@wilsonconst.com>
Cc: SUGAHARA Kenji <Kenji.SUGAHARA@odav.oregon.gov>
Subject: RE: Extension Request

Hi Tony, I have received your email and forwarded it to the master planning team.

A couple clarifications, I don't recall making statements exactly as you described below. I remember explaining that the FAA has been very clear about the need for UAO to meet standards, especially regarding the ROFA. I also didn't ask anyone to "play ball," but I did state that we risk losing NPIAS status if we don't address the airport's issues.

I believe you've been in touch with the appropriate point of contact at the FAA to get answers to your questions. We'll be back in touch regarding your requests as soon as we can.

Tony Beach
OREGON DEPARTMENT OF AVIATION
STATE AIRPORTS MANAGER
OFFICE 503-378-2523 **CELL** 503-302-5455
M-F 7:30am – 4pm

From: Helbling, Tony <helbling@wilsonconst.com>
Sent: Thursday, August 15, 2024 9:54 AM
To: BEACH Anthony <Anthony.BEACH@odav.oregon.gov>
Subject: Extension Request

This message was sent from outside the organization. Treat attachments, links and requests with caution. Be conscious of the information you share if you respond.

Tony,

At my computer this morning – following up on our phone conversation yesterday.

We are asking for a 30 day extension to the August 20, 2024 deadline for comments to the July 30, 2024 presented MP Alternatives.

I fully understand ODAV has spent $$ advertising future dates, meetings, etc.

I looked at the JLA website to find contact names you specified at the consultant's office to also send this extension request. Only name on there is Alex in your shop. Please forward this email on to the consultants as I don't have their contact info.

As discussed, the PAC was not allowed to see the proposed alternatives BEFORE the meeting. We were VERY surprised to see the extent of affect on private properties on BOTH sides of highway 551.

We were given three weeks to comment or propose our alternatives to a document call for the taking of private property. This is far too short a time to respond to this important an issue.

Additionally, we've asked for documentation providing background on the two assumptions –

1. there will be no more modifications to standards and

2. if the airport does not come into compliance, KUAO will move into a "maintenance mode".

In our discussion yesterday, you explained this was not ODAV's decision, it was the decision of the FAA/ADO both in Seattle and nationally to place these restrictions. We want to know who at the FAA/ADO made those statements an/or that ODAV provide source documents. You also explained it would be nearly impossible to provide documentation before the August 20th deadline.

You told me that if KUAO does not come into compliance and if we as owners "play ball" with ODAV on this, the FAA will rescind NPIAS status of KUAO will be taken away by the FAA. We are now asking you to provide source information for the potential cancelation of NPIAS status. Who at the FAA is claiming that KUAO may lose NPIAS status?

We are very concerned with the presented alternatives for obvious reasons and now, an additional reason… even though the proposed alternatives are in "draft" right now, they DIRECTLY AND IN REAL TIME affect the value of the properties. **This is absolutely not acceptable**.

Please acknowledge receipt of this email.

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U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION

National Policy

ORDER 5100.38D, Change 1

Effective date:
September 30, 2018

SUBJ: Airport Improvement Program Handbook

1. PURPOSE.

This Handbook provides guidance and sets forth policy and procedures used in the administration of the Airport Improvement Program.

2. DISTRIBUTION.

This Handbook is located on the FAA Office of Airports website (see Appendix B for link) where it is available to all interested parties.

3. CANCELLATION.

This Handbook cancels the following order:

- FAA Order 5100.38D, Airport Improvement Program Handbook (dated September 30, 2014).

4. EXPLANATION OF CHANGES.

This Handbook replaces the above order with updated information that reflects current legislation and policy as of September 30, 2018, with the exception Program Guidance Letter (PGL) 17-01. The changes in this Handbook also reflect feedback from industry stakeholders over the last four years, and does not yet reflect changes in FAA Reauthorization Act of 2018 (Public Law 115-254), which will initially be addressed in the form of a PGL and then in a subsequent update of the AIP Handbook itself. The FAA Office of Airports has streamlined this Handbook and replaced guidance with references where there is a more appropriate source of guidance (such as in other orders or advisory circulars). This included deleting guidance on airport planning, capital planning, labor rates, and civil rights. The references appear as the basic publication number without any suffix. The intent is for the reader to use the latest version of the referenced publication.

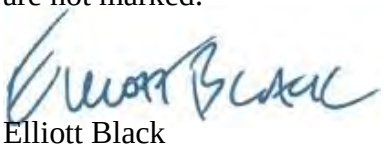
The Office of Airports is issuing Change 1 to this Handbook to:

- Incorporate program guidance letters (PGL) issued up to, but not including PGL 17-01.
- Reflect the transition to 2 Code of Federal Regulations (CFR) part 200, which became effective on December 19, 2014.
- Incorporate legislation from the authorization extensions following the expiration of the FAA Modernization and Reform Act of 2012 (Public Law 112-95), which includes the following.

- The Airport and Airway Extension Act of 2015 (Public Law 114-55) enacted September 30, 2015.
- The Airport and Airway Extension Act of 2016 (Public Law 114-141) enacted March 30, 2016.
- The FAA Extension, Safety, and Security Act of 2016 (Public Law 114-190) enacted on July 15, 2016.
- The Disaster Tax Relief and Airport and Airway Extension Act of 2017 (Public Law 115-63) enacted September 29, 2017.
- The Consolidated Appropriations Act, 2018 (Public Law 115-141) enacted March 23, 2018.
- Note that the FAA Reauthorization Act of 2018 (Public Law 115-254) enacted on October 5, 2018 *was not* incorporated.

- Include provisions from the following appropriation:
  - The Consolidated Appropriations Act of 2016 (Public Law 114-113), enacted December 18, 2015.
  - The Consolidated Appropriations Act of 2017 (Public Law 115-31) enacted May 5, 2017.
  - The Consolidated Appropriations Act, 2018 (Public Law 115-141) enacted March 23, 2018.

Vertical bars in the margins indicate the substantive text revisions made in Change 1. The FAA Office of Airports will publish a separate summary of changes as a companion document to Change 1. Non-substantive formatting, grammar, and wording changes were made throughout Change 1, which requires FAA Order 5100.38D to be replaced by Change 1 in its entirety, and are not marked.



Elliott Black
Director, Office of Airports Planning and Programming

Table of Contents

Chapter 1. What do I need to know about this order? 1-1

1-1. This Order Is Called the *Handbook*. 1-1
1-2. Purpose of the Handbook. 1-1
1-3. Handbook Audience. 1-1
1-4. Handbook Location on the Internet. 1-1
1-5. Publications this Handbook Cancels. 1-1
1-6. Relevant AIP Legislation (Referred to as the Act). 1-1
1-7. AIP Transition to 2 CFR part 200. 1-2
1-8. Format for References to the Act. 1-4
1-9. Broad Objective of the Act. 1-4
1-10. The Act is a *Permissive* Statute. 1-4
1-11. Aviation Priorities in the Act. 1-5
1-12. List of Handbook References (with Links to the Associated Websites). 1-5
1-13. General Principles of this Handbook. 1-5
1-14. Warning on Taking Handbook Text Out of Context. 1-6
1-15. Use of the Term Airports District Office (ADO). 1-6
1-16. Use of the Phrase *ADO has the option*. 1-6
1-17. FAA Office of Airports Positions/Divisions/Branches Referenced in this Handbook. 1-6
1-18. Location of Handbook Definitions. 1-7
1-19. Process for Handbook Changes. 1-7
1-20. Supplemental Guidance and Standard Operating Procedures. 1-7
1-21. New Handbook Layout and Format. 1-7

Chapter 2. Who can get a grant? 2-1

2-1. Grant Recipients are Referred to as Sponsors. 2-1
2-2. Type of Sponsors. 2-1
2-3. Type of Projects Each Sponsor Type Can Receive in a Grant. 2-2
2-4. Grant Assurances – Definition and Which Ones to Use. 2-5
2-5. Grant Assurances – Duration and Applicability. 2-9
2-6. Sponsor Qualification Criteria. 2-14
2-7. State Sponsorship Benefits. 2-20
2-8. Sponsorship Determination Process. 2-20
2-9. Transfer of Sponsorship. 2-20
2-10. Conflicting Grant Requests from More than One Entity. 2-21

Chapter 3. What projects can be funded? 3-1

Section 1. List of 16 Requirements for Project Funding. 3-1

3-1. List of 16 Requirements for Project Funding. 3-1

Section 2. Project Eligible. 3-2

3-2. The Act Establishes the General Types of Eligible Projects. 3-2
3-3. Project Requirement Tables (in the Appendices by Project Type). 3-2
3-4. Prohibited Project and Unallowable Cost Tables. 3-2
3-5. Only Specific Equipment is Eligible under the Act. 3-2
3-6. Eligibility of Maintenance, Rehabilitation, Reconstruction, and Replacement Projects. 3-2
3-7. Difference between AIP and Passenger Facility Charge (PFC) Eligibility. 3-6

Section 3. Project Justified. 3-7

3-8. Three Basic Tests for Project Justification. 3-7
3-9. Justification Requirements for Safety and Security Projects. 3-8
3-10. Justification Requirements for Unclassified Airport Projects. 3-8
3-11. The Use of Critical Aircraft for Justification. 3-9

3-12. Useful Life Test for Equipment and Facilities. 3-9
3-13. Benefit-Cost Analysis (BCA) for NAVAIDs and Weather Reporting Equipment. 3-10
3-14. BCAs for Capacity Projects Using Discretionary Funds. 3-10
3-15. BCAs for All Other Projects. 3-12

Section 4. Project on Airport Property (with Good Title). 3-12

3-16. On-Airport Property Requirements. 3-12

Section 5. Project on Airport Layout Plan. 3-14

3-17. Airport Layout Plan Requirement. 3-14

Section 6. Intergovernmental Review and Airport User Consultation Complete. 3-15

3-18. Intergovernmental Review. 3-15
3-19. Consultation with Airport Users. 3-16

Section 7. FAA Environmental Finding Complete. 3-17

3-20. Environmental Finding Requirements. 3-17

Section 8. Usable Unit of Work Obtained. 3-17

3-21. Usable Unit Requirements (and Phased Project Conditions). 3-17

Section 9. FAA Standards Met. 3-18

3-22. Mandatory FAA Standards. 3-18
3-23. Modification to FAA Standards (or Specifications). 3-19
3-24. Standards that Exceed those of the FAA. 3-20
3-25. Eligibility Differences between the Handbook and the Advisory Circulars. 3-23
3-26. Approval and Use of State Standards. 3-23
3-27. Projects with No FAA Standard. 3-24
3-28. ADO Review of Plans and Specifications. 3-24

Section 10. Project Procured Correctly. 3-25

3-29. Importance of 2 CFR §§ 200.317-200.326 (Formerly 49 CFR § 18.36). 3-25
3-30. Sponsor Procurement Requirements. 3-26
3-31. Summary Table of Mandatory/Optional ADO Procurement Review. 3-26
3-32. Bid Protests and Appeals. 3-29
3-33. Procurement Protests and Appeals after the Contract Award. 3-31
3-34. Bonding that Does Not Meet the Minimum Requirements. 3-31
3-35. Noncompetitive Proposals (Including Sole Source and Inadequate Number of Qualified Sources). 3-32
3-36. Limited Noncompetitive Proposal Situations (ALCMS Modifications, One Manufacturer, Sponsor Preferred, Prohibited LED Lighting). 3-32
3-37. Change Orders, Supplemental Agreements, and Contract Modifications. 3-34
3-38. Contract Clauses and Contract Provisions Required for AIP Grants. 3-34
3-39. Contracts Containing Ineligible and/or Non-AIP Funded Work (Including Proration). 3-34
3-40. Contracts Containing Requirements that May Reduce the Number of Potential Bidders. 3-36
3-41. Contracts Containing Work that Exceeds FAA Standards. 3-36
3-42. Consultant Contracts (Qualifications Based with Negotiated Price). 3-37
3-43. Design-Build and Construction Manager-at-Risk Contracts. 3-37
3-44. Engineering Materials Arrestor System (EMAS). 3-38
3-45. Bid Alternates (Including Life Cycle Cost Analysis Alternates) and Bid Additives. 3-39
3-46. Bidding Asphalt and Concrete Alternates. 3-39
3-47. Buy American Requirements. 3-39
3-48. DOT Office of Inspector General (OIG) Notification of Potential Procurement/Bid Improprieties. 3-40
3-49. Escalator Clauses. 3-41

3-50. Plans and Specifications Review. 3-41
3-51. Pre-award Review of Contracts. 3-41
3-52. Sponsor's Procurement System. 3-42
3-53. Force Account Work. 3-42
3-54. Value Engineering. 3-44
3-55. Indefinite Delivery (Task Orders) Extensions for *Construction* Services. 3-45
3-56. Indefinite Delivery (Task Orders) Extensions for *Consultant* Services. 3-45
3-57. Suspension or Debarment of Persons or Companies. 3-45

Section 11. Cost Allowable. 3-46

3-58. Allowable Cost Legislation and Policy. 3-46
3-59. Unallowable Cost Table. 3-47
3-60. Administrative Costs. 3-47
3-61. Indirect Costs. 3-50
3-62. Architectural Enhancements Costs. 3-52
3-63. Benefit-Cost Analysis (BCA) Costs. 3-53
3-64. Construction Costs. 3-53
3-65. Construction Project Signs Costs. 3-53
3-66. Computer Software and Data Subscription Costs. 3-53
3-67. Disadvantaged Business Enterprise (DBE) Plan Updates. 3-53
3-68. Drainage Costs. 3-54
3-69. Duct Bank Costs for Ineligible Facilities. 3-54
3-70. Energy Efficiency (Green/Sustainable) Improvement Costs. 3-54
3-71. Engineering and Architectural (A/E) Costs. 3-55
3-72. Environmental Finding Costs. 3-56
3-73. Equipment Leasing (instead of Purchase) Costs. 3-56
3-74. Facility Impeding an AIP Development Project – Costs to Rebuild or Relocate in Another Location. 3-56
3-75. Flight Check. 3-62
3-76. Force Account Costs. 3-63
3-77. Geographic Information System (GIS) Data Collection. 3-63
3-78. Heated Airfield Pavement. 3-64
3-79. Historic Building Costs. 3-64
3-80. Hydrant Fuel Lines and Pit Costs. 3-64
3-81. Land Acquisition Costs. 3-64
3-82. Legal Fees and Settlement Costs. 3-67
3-83. Lighted X's and Other Runway Closure Markings Costs. 3-68
3-84. Nonroad Diesel Engines. 3-68
3-85. Normally Unallowable Costs that are Necessary to Carry Out the Project. 3-69
3-86. Project Formulation Costs. 3-69
3-87. Reimbursable Agreements with Other Federal Agencies. 3-70
3-88. Safety Management System (SMS) and Safety Risk Management (SRM) Costs. 3-70
3-89. Secondary Electrical Power Supply Costs. 3-71
3-90. Seismic Standards. 3-72
3-91. Site Preparation Costs for Ineligible Work. 3-72
3-92. Spare Part Costs. 3-72
3-93. Sponsor Furnished Materials or Supplies. 3-73
3-94. Temporary Construction Costs. 3-75
3-95. Thermoplastic Markings. 3-76
3-96. Used Equipment Costs. 3-76
3-97. Utility Costs. 3-76
3-98. Value Engineering. 3-77

Section 12. Costs Necessary (Allowable Cost Rule #1). 3-77

3-99. Requirements for Costs to be Necessary. 3-77

Section 13. Costs Incurred after Grant Executed (Allowable Cost Rule #2). 3-77

3-100. Rules for Reimbursing Project Costs Prior to the Grant (or LOI) Execution Date. 3-77

Section 14. Costs Reasonable (Allowable Cost Rule #3). 3-83

3-101. Sponsor Requirements. 3-83
3-102. ADO Review Requirements. 3-86
3-103. Documentation of ADO Determination. 3-86

Section 15. Costs Not in Another Federal Grant (Allowable Cost Rule #4). 3-87

3-104. Requirement for Costs to Not be in Another Federal Grant. 3-87

Section 16. Costs within Federal Share (Allowable Cost Rule #5). 3-87

3-105. Allowable Federal Share Requirement. 3-87

Section 17. No Unreasonable Delay in Completion. 3-87

3-106. Requirement for No Unreasonable Delay in Project Completion. 3-87

Chapter 4. What AIP funding is available? 4-1

4-1. Legislation Needed to Issue AIP Grants (Authorization/Appropriation). 4-1
4-2. Airport and Airway Trust Fund (Source of AIP). 4-1
4-3. Calendar Year Used for Passenger Boardings, Entitlements, and Cargo Landed Weight. 4-1
4-4. Categories of AIP Funding (Including Calculations and Legislative References). 4-1
4-5. Types of Potential Funding by Airport Type (Including Airport Type Definitions). 4-7
4-6. Airports that Can Use Each Fund Type (Funding Restrictions by Airport Type). 4-14
4-7. Project Restrictions by Fund Type. 4-18
4-8. Fund Expiration Time Frames by Airport and Fund Type. 4-23
4-9. Federal Share by Airport Type (Including Exceptions). 4-24
4-10. Federal Share Exception for States with Large Amounts of Public Land 4-28
4-11. Transfer of Entitlement Funds between Airports. 4-29
4-12. Use of Donations (or Previously Acquired Land) as the Sponsor Share. 4-33
4-13. Budget Augmentation (Combining Funds between Different Federal Programs). 4-42

Chapter 5. How does the grant process work? 5-1

Section 1. Basic Grant Steps. 5-1

5-1. Basic Grant Steps. 5-1

Section 2. Pre-Grant Actions. 5-1

5-2. Introduction. 5-1
5-3. Identification of Potential Projects by Sponsors and ADO. 5-2
5-4. Early Coordination between ADO and Sponsor. 5-4
5-5. ADO Verification of Sponsor Eligibility. 5-5
5-6. ADO Verification that All Project Requirements Will Be Met. 5-5
5-7. ADO Verification that Airport Layout Plan is Current. 5-5
5-8. ADO Notification to New Sponsors of Flood Insurance Requirements. 5-6
5-9. ADO Notification and Verification of Sponsor Civil Rights Requirements. 5-6
5-10. ADO Verification that Risk Level Determination is Current. 5-7
5-11. ADO Review of Open Grant Status. 5-7
5-12. ADO Verification that Competition Plan is Current. 5-7

Section 3. Grant Programming. 5-8

5-13. Introduction. 5-8
5-14. Project Evaluation Report and Development Analysis (PERADA) Completion. 5-8
5-15. Grant Programming. 5-8

5-16. Congressional Notification. 5-8
5-17. Sponsor Notification. 5-9

Section 4. Grant Application, Offer, and Acceptance. 5-9

5-18. Introduction. 5-9
5-19. Grant Application Package Submittal. 5-9
5-20. Grant Application Review. 5-12
5-21. Reservation of Funds. 5-13
5-22. Grant Offer. 5-14
5-23. Grant Acceptance 5-23
5-24. The FAA Office of Finance and Management, FAA Accounts Payable Section B (AMK-314) Notification. 5-23

Section 5. ADO Grant Oversight. 5-23

5-25. ADO Oversight (and Required Sponsor Documentation) Based on Sponsor Risk Level. 5-23
5-26. Requirement to Include a Copy of FAA Determinations in the Grant File. 5-24
5-27. Statutory Requirement for ADO Project Oversight. 5-24
5-28. Safety Risk Management (SRM) Panels 5-24
5-29. Construction Safety Phasing Plans. 5-24
5-30. Predesign, Prebid, and Preconstruction Conferences. 5-24
5-31. Equipment Photographs. 5-25
5-32. Construction Photographs. 5-25
5-33. Construction Management Programs. 5-25
5-34. Notices to Proceed. 5-25
5-35. Change Orders, Supplemental Agreements, and Contract Modifications. 5-25
5-36. Periodic Inspections. 5-30
5-37. Construction Progress and Inspection Report. 5-30
5-38. Meetings for Planning and Environmental Study Grants. 5-30
5-39. Forecasts in Planning or Environmental Projects. 5-30
5-40. Performance Report (formerly called Quarterly Performance Report). 5-30
5-41. Annual Reporting of Residential Population Benefits. 5-32
5-42. Final Inspection. 5-32

Section 6. Grant Payments. 5-32

5-43. Summary of Payment Request Requirements and Limitations. 5-32
5-44. Requirements and Process for Using the Current DOT Electronic Payment System. 5-33
5-45. Requirements for Frequency of Payment Requests and Expenditure Rate. 5-34
5-46. Requirements for Approving Payment within the Last 10% of the Federal Share. 5-34
5-47. Requirements for Payment Requests to be Based on Incurred Costs. 5-35
5-48. Requirements for Reducing or Withholding Payments. 5-35
5-49. Limitations for Contract Retainage. 5-36
5-50. Limitations for Contractor Disputed Costs. 5-38
5-51. Limitations for Land Acquisition Costs. 5-38
5-52. Requirements for Avoiding Improper Payments. 5-38
5-53. Requirements for Financial Reporting (Standard Forms 425, 271, and 270). 5-40
5-54. Requirements for Retaining/Providing Supporting Documentation. 5-40

Section 7. Grant Amendments. 5-40

5-55. Criteria for Amending a Grant. 5-40
5-56. Procedure for the ADO to Process an Amendment. 5-51

Section 8. Grant Closeouts. 5-52

5-57. Grant Closeout Steps and Requirements. 5-52
5-58. Block Grant Closeout. 5-57

Section 9. Grant Suspension and/or Termination. 5-58

5-59. Reasons for Possible Grant Suspension or Termination. 5-58
5-60. Suspension of a Grant. 5-58
5-61. Termination for Cause. 5-59
5-62. Termination for Convenience. 5-60

Section 10. Post-Grant Actions. 5-60

5-63. Sponsor Records Retention. 5-60
5-64. ADO Records Retention. 5-61
5-65. Reopening Grants. 5-61
5-66. Audit Requirements. 5-61
5-67. Disposal of AIP Funded Equipment. 5-63
5-68. Disposal of Excess/Unneeded AIP Funded Land (and ADO/Sponsor Tracking). 5-64

Chapter 6. What special AIP programs are available? 6-1

Section 1. Letters of Intent (LOI). 6-1

6-1. LOI Overview. 6-1
6-2. LOI Funding Rules and Policy. 6-1
6-3. LOI in the Context of an Airport's Overall Capital Program. 6-3
6-4. LOI Project Criteria by Airport Type. 6-4
6-5. LOI Approval/Disapproval Process. 6-7
6-6. Sponsor LOI Submission Requirements. 6-9
6-7. LOI Evaluation Criteria. 6-12
6-8. LOI Offer Package 6-12
6-9. LOI Grant Administration. 6-14
6-10. LOI Amendments. 6-14
6-11. LOI Closeout. 6-15
6-12. Revising, Suspending, or Terminating an LOI. 6-15

Section 2. State Block Grant. 6-15

6-13. General. 6-15
6-14. Limited State Flexibility. 6-15
6-15. Responsibilities Retained by the FAA. 6-15
6-16. Legislative History and List of Participants. 6-16
6-17. State Block Grant Program Application 6-17
6-18. FAA Selection of State Block Grant Participants. 6-18
6-19. Memorandum of Agreement. 6-19
6-20. Grant Assurances 6-19
6-21. Criteria for an Airport to be in the State Block Grant Program. 6-20
6-22. ADO Right to Issue Grants Directly to Airports in the State Block Grant Program. 6-20
6-23. Decision Authority for Discretionary Funds. 6-20
6-24. Grant Federal Share 6-21
6-25. Grant and Amendment Processes. 6-21
6-26. Transfer of AIP Funding between Airports. 6-21
6-27. Project Eligibility and Allowable Costs. 6-21
6-28. Project Administrative Costs. 6-22
6-29. Program Administration Costs. 6-22
6-30. Required Timeframe to Issue Subgrants. 6-22
6-31. Grant/Project Oversight. 6-22
6-32. Grant Payments. 6-22
6-33. Grant Closeout. 6-22
6-34. Program Review by the FAA. 6-22
6-35. Accounting and Audits. 6-22
6-36. Suspension/Termination of a Grant Issued under the State Block Grant Program. 6-22
6-37. Suspension of a State from the State Block Grant Program. 6-23

6-38. Removal or Voluntary Withdrawal from the State Block Grant Program. 6-23

Section 3. Military Airport Program. 6-23

6-39. General. 6-23
6-40. AIP Funding. 6-24
6-41. Designation Authority. 6-24
6-42. Original MAP Designation Duration. 6-24
6-43. Redesignation Duration. 6-24
6-44. Requirements. 6-24
6-45. Typical MAP Projects. 6-27
6-46. Use of Regular AIP on a MAP Designated Airport. 6-28
6-47. MAP Funding Limitations. 6-28
6-48. Reimbursement with Discretionary. 6-28
6-49. Application Process. 6-28

Section 4. Innovative Finance Demonstration Program. 6-29

6-50. Legislative History and References. 6-29
6-51. Program Rules. 6-29

Section 5. Voluntary Airport Low Emission Program (VALE). 6-30

6-52. Legislative History. 6-30
6-53. Legislative References. 6-31
6-54. Purpose and General Overview. 6-31
6-55. Available Guidance. 6-31
6-56. Application and Grant Process. 6-32
6-57. Project Funding Requirements. 6-32

Section 6. Zero Emission Vehicle and Infrastructure Pilot Program. 6-32

6-58. Legislative History. 6-32
6-59. Legislative References. 6-32
6-60. Purpose. 6-33
6-61. Available Guidance. 6-33
6-62. Application and Grant Process. 6-33
6-63. Project Funding Requirements. 6-33

Section 7. Program to Increase Energy Efficiency of Airport Power Sources. 6-33

6-64. Legislative History. 6-33
6-65. Legislative References. 6-33
6-66. Purpose. 6-34
6-67. Available Guidance. 6-34
6-68. Application and Grant Process. 6-34
6-69. Funding and Federal Share. 6-34
6-70. Project Funding Requirements. 6-34

Section 8. Airport Development Rights Pilot Program. 6-34

6-71. Legislative History. 6-34
6-72. Rules of the Pilot Program. 6-34

Section 9. Redevelopment of Airport Properties Pilot Program. 6-39

6-73. Legislative History. 6-39
6-74. Purpose. 6-39
6-75. Availability of Guidance. 6-39

Appendix A. Definitions of Terms Used in this Handbook A-1

A-1. Definitions of Terms Used in this Handbook. A-1

Appendix B. References and Web Links B-1

B-1. References and Web Links. B-1

Appendix C. Prohibited Projects and Unallowable Costs C-1

C-1. Examples of General Prohibited Projects/Costs (for All Types of Projects). C-1
C-2. Examples of Construction Prohibited Projects/Costs. C-6
C-3. Examples of Equipment Prohibited Projects/Costs. C-14
C-4. Examples of Land Prohibited Projects/Costs. C-18
C-5. Examples of Noise Mitigation Prohibited Projects/Costs. C-19
C-6. Examples of Planning or Environmental Prohibited Projects/Costs. C-22

Appendix D. Miscellaneous Projects D-1

D-1. How to Use This Appendix. D-1
D-2. Airfield Needs Requirement for Revenue Producing Aeronautical Support Facilities. D-1
D-3. Project Requirements. D-1

Appendix E. Planning Projects E-1

E-1. How to Use This Appendix. E-1
E-2. Conditions for Posting Planning Documents on the Internet. E-1
E-3. Disclaimer for AIP Funded Planning Studies. E-1
E-4. Stand-Alone Master Plan and System Plan (Metropolitan and State) Projects. E-1
E-5. Project Requirements Table. E-4

Appendix F. New Airport Projects F-1

F-1. How to Use This Appendix. F-1
F-2. Project Requirements Tables. F-1

Appendix G. Runway Projects G-1

G-1. How to Use This Appendix. G-1
G-2. Secondary, Crosswind and Additional Runways. G-1
G-3. Pavement Condition Index Requirements for Airfield Pavement Projects. G-2
G-4. Project Requirements Tables. G-3

Appendix H. Taxiway Projects H-1

H-1. How to Use This Appendix. H-1
H-2. Taxiway Types (and Associated AIP Funding Rules). H-1
H-3. Pavement Condition Index Requirements for Airfield Pavement Projects. H-2
H-4. Project Requirements Tables. H-2

Appendix I. Apron Projects I-1

I-1. How to Use This Appendix. I-1
I-2. Non-Exclusive Use Available for Public Aircraft Parking/Access. I-1
I-3. Apron in Front of a Building. I-1
I-4. Pavement Condition Index Requirements for Airfield Pavement Projects. I-1
I-5. Project Requirements Tables. I-2

Appendix J. Airfield Marking, Signage, and Lighting Projects J-1

J-1. How to Use This Appendix. J-1
J-2. Eligibility of Pavement Marking as a Stand-Alone Project. J-1
J-3. Eligibility of Sign Panel Replacement as a Stand-Alone Project. J-1
J-4. Airport Lighting Control Panel Modification. J-2
J-5. Certified Lighting Equipment for which there is Only a Single Manufacturer. J-3
J-6. Lighting for Pavement that Exceeds FAA Design Standards. J-3
J-7. Project Requirements Table. J-3

Appendix K. Navigational Aid (NAVAID) and Weather Reporting Equipment Projects K-1

K-1. How to Use This Appendix. K-1
K-2. Installation of Instrument Landing Systems (ILS). K-1
K-3. Transfer of Equipment to the FAA Air Traffic Organization (ATO). K-1
K-4. Required FAA Air Traffic Organization (ATO) Coordination. K-2
K-5. Designated Instrument Runway Requirement. K-2
K-6. NAVAID and Weather Reporting Equipment Communication Requirements. K-2
K-7. Compass Calibration Pad. K-2
K-8. Airside Service Roads to Access AIP Eligible NAVAIDs. K-2
K-9. Project Requirements Table. K-2

Appendix L. Safety and Security Equipment Projects L-1

L-1. How to Use This Appendix. L-1
L-2. Justification for Safety and Security Equipment. L-1
L-3. Safety Equipment beyond 14 CFR part 139 Requirements. L-1
L-4. Use of Safety and Security Equipment. L-1
L-5. Off-Airport Storage of ARFF Equipment. L-1
L-6. Radios and Communication Equipment. L-2
L-7. Security Equipment beyond 49 CFR part 1542 Requirements. L-2
L-8. Sensitive Security Information. L-2
L-9. Project Requirements Table. L-2

Appendix M. Other Equipment Projects M-1

M-1. How to Use This Appendix. M-1
M-2. Project Requirements Table. M-1

Appendix N. Terminal Building Projects N-1

N-1. How to Use This Appendix. N-1
N-2. Eligibility of Terminals Non-Commercial Service Airports. N-1
N-3. Public-Use and Movement of Passengers/Baggage Requirements. N-1
N-4. Revenue Producing Eligibility and Conditions for Terminal Buildings. N-2
N-5. Safety, Security, and Access Needs Met. N-3
N-6. Terminal Areas Related to Security (Landside, Sterile, and Secured). N-3
N-7. Prorated Areas and High Cost Eligible/Ineligible Items. N-4
N-8. Terminal Area Impacted by an AIP Eligible Terminal Project. N-4
N-9. Typical Eligible Areas/Equipment within a Terminal Building. N-4
N-10. Additional Eligible Terminal Areas/Equipment at Nonhub Primary and Nonprimary Airports. N-7
N-11. Terminal Building Funding Rules by Airport Type. N-8
N-12. Project Requirements Tables. N-10

Appendix O. Other Building Projects O-1

O-1. How to Use This Appendix. O-1
O-2. Aircraft Rescue & Firefighting Building Costs at 14 CFR part 139 Airports. O-1
O-3. Project Requirements Tables. O-2

Appendix P. Roads and Surface Transportation Projects P-1

P-1. How to Use This Appendix. P-1
P-2. Project Requirements Tables. P-1

Appendix Q. Land Projects Q-1

Q-1. How to Use This Appendix. Q-1
Q-2. General Eligibility Requirements. Q-1
Q-3. Applicable Land Orders, Regulations, and Advisory Circulars. Q-1
Q-4. Appraisal Requirement. Q-1

Q-5. Good Title Requirements for Land and Easement Acquisition. Q-2
Q-6. Acceptable Land Interests. Q-2
Q-7. Logical Boundaries. Q-3
Q-8. Uneconomic Remnants. Q-3
Q-9. Disposal of Excess Land. Q-3
Q-10. Purchasing Land from a State/Local Public Agency. Q-3
Q-11. Project Requirements Tables. Q-4

Appendix R. Noise Compatibility Planning/Projects R-1

R-1. How to Use This Appendix. R-1
R-2. General Eligibility Requirements (The Four Types of Justification). R-1
R-3. Noncompatible Land Uses. R-1
R-4. Not all 14 CFR part 150 Measures are Eligible. R-2
R-5. Reduction Due to Aircraft Noise Associated with the Airport. R-2
R-6. Eligible Noise Contour Threshold (or the Use of a Lower Local Standards). R-2
R-7. Required Validation of the Noise Exposure Maps. R-2
R-8. Interior Noise Level Requirements. R-3
R-9. Block Rounding. R-4
R-10. Neighborhood Equity. R-4
R-11. Pre- and Post-Testing Criteria for Noise Insulation Projects. R-5
R-12. Conditions for Posting Planning Documents on the Internet. R-8
R-13. Disposal of Excess/Unneeded AIP Funded Noise Land (and ADO/Sponsor Tracking). R-8
R-14. Project Requirements Tables. R-8

Appendix S. Environmental Planning/Mitigation Projects S-1

S-1. How to Use This Appendix. S-1
S-2. Conditions for Posting Planning Documents on the Internet. S-1
S-3. Project Requirements Tables. S-1

Appendix T. Military Airport Program Projects T-1

T-1. How to Use This Appendix. T-1
T-2. Project Requirements Tables. T-1

Appendix U. Sponsor Procurement Requirements (Including 2 CFR §§ 200.317-200.326 (formerly 49 CFR § 18.36)) U-1

U-1. Appendix Layout. U-1
U-2. Sponsor Force Account Costs. U-1
U-3. Sponsor Furnished Material or Supplies. U-1
U-4. Buy American Requirements. U-1
U-5. Suspension or Debarment of Persons or Companies. U-1
U-6. Terminology Used in Industry U-2
U-7. Prohibited Light Emitting Diode (LED) Lighting. U-2
U-8. Why 2 CFR §§ 200.317-200.326 is Reproduced in This Appendix. U-3
U-9. 2 CFR § 200.317 - Procurements by States. U-3
U-10. 2 CFR § 200.318 - General Procurement Standards. U-3
U-11. 2 CFR § 200.319 - Competition. U-7
U-12. 2 CFR § 200.320 - Methods of Procurement to be Followed. U-10
U-13. 2 CFR § 200.320(a) - Procurement by Micro-Purchases. U-11
U-14. 2 CFR § 200.320(b) - Procurement by Small Purchase Procedures. U-12
U-15. 2 CFR § 200.320(c) - Procurement by Sealed Bids (Formal Advertising). U-13
U-16. 2 CFR § 200.320(d) - Procurement by Competitive Proposals. U-16
U-17. 2 CFR § 200.320(e) - Reserved. U-21
U-18. 2 CFR § 200.320(f) - Procurement by Noncompetitive Proposals. U-22
U-19. 2 CFR § 200.321 - Contracting with Small and Minority Businesses, Women's Business Enterprises, and Labor Surplus Area Firms. U-24
U-20. 2 CFR § 200.322 - Procurement of Recovered Materials. U-25

U-21. 2 CFR § 200.323, Contract Cost and Price. U-26
U-22. 2 CFR § 200.324 - Federal Awarding Agency or Pass-Through Entity Review. U-28
U-23. 2 CFR § 200.325 - Bonding Requirements. U-30
U-24. 2 CFR § 200.326 - Contract provisions. U-31

Appendix V. Revenue Sources for the Airport and Airway Trust Fund V-1

V-1. General. V-1

Appendix W. Competition Plans W-1

W-1. Legislative History. W-1
W-2. Purpose. W-1
W-3. Covered Airports. W-1
W-4. Prohibition on Grant Execution. W-1
W-5. Requirements for Initial Plan Submittal and Updates. W-2
W-6. Initial Competition Plan Contents. W-3
W-7. Competition Plan Update Contents. W-7
W-8. Sponsor Guidance. W-8
W-9. Plan Review Process. W-8
W-10. Additional FAA Actions. W-8
W-11. Plan Development Eligibility. W-8

Appendix X. Buy American Guidance X-1

X-1. General Sponsor Buy American Requirements. X-1
X-2. Other Buy American and Buy America Requirements. X-1
X-3. Changes Orders and Buy American Requirements. X-1
X-4. Buy American Waiver Process and Delegation. X-1
X-5. National Buy American Waiver. X-4
X-6. Definitions. X-4

Appendix Y. Federal Share at Public Land State Airports Y-1

Y-1. General Federal Share Definition. Y-1
Y-2. Public Land States Definition. Y-1
Y-3. History of the Public Land Share Formula. Y-2
Y-4. Calculating the Federal Share in Public Land States Using the Part ‘b’ and Part ‘c’ Formulas. Y-3
Y-5. Part ‘b’ Formula. Y-3
Y-6. Part ‘c’ Calculation (the Grandfather Rule). Y-9
Y-7. Public Land State Federal Share Results. Y-10

Appendix Z. Establishment and Category Upgrade Policy for Instrument Landing Systems (ILS) Z-1

Z-1. Background. Z-1
Z-2. Use of RNAV Approaches Instead of Cat I ILS Systems. Z-1
Z-3. FAA Air Traffic Organization (ATO) Funding for Cat I ILSs. Z-1
Z-4. AIP Funding for Cat I ILSs. Z-2
Z-5. AIP or ATO Funding of Cat II/III ILSs. Z-2
Z-6. AIP Transition from ILS to RNAV. Z-2

List of Tables and Figures

Table 1-1 AIP Related Legislation 1-2
Table 1-2 Crosswalk between 2 CFR part 200 and Previous OMB Circulars (see Appendix B for link to the website containing these crosswalks) 1-3
Table 1-3 Examples of Differences Where 2 CFR part 200 is Addressing Grant Program Administration 1-3
Table 1-4 Differences Between AIP Policy and 2 CFR part 200 1-4
Table 1-5 FAA Office of Airports Key Positions 1-6
Table 1-6 FAA Office of Airports Divisions and Branches 1-7
Table 1-7 Handbook Chapters 1-8
Table 1-8 Handbook Appendices 1-9
Table 2-1 Types of Sponsors 2-1
Table 2-2 Types of Projects that May be Included in a Grant (by Sponsor Type) 2-3
Table 2-3 Statutory Basis for Grant Assurances 2-6
Table 2-4 Applicable Grant Assurances (by Sponsor and Project Type) 2-6
Table 2-5 Duration and Applicability of Grant Assurances (Airport Sponsors) 2-10
Table 2-6 Duration and Applicability of Grant Assurances (Planning Agency Sponsors) 2-11
Table 2-7 Duration and Applicability of Grant Assurances (Non-Airport Sponsors Undertaking Noise Compatibility Program Projects) 2-12
Table 2-8. Duration and Applicability of Grant Assurances (Aviation Block Grant Program)* 2-14
Table 2-9 Legal and Financial Requirements for Public Agencies 2-15
Table 2-10 Legal and Financial Requirements for Private Entities 2-16
Table 2-11 Additional Criteria, Requirements, and Considerations for Specific Sponsorship Situations 2-17
Table 3-1 The 16 General Requirements for Project Funding 3-1
Table 3-2 Differences between Maintenance, Rehabilitation, Reconstruction, and Replacement Projects 3-3
Table 3-3 Examples of Maintenance, Rehabilitation, Reconstruction, and Replacement Projects 3-4
Table 3-4 Three Basic Tests to Determine if a Project is Justified 3-7
Table 3-5 Examples of Projects Not Meeting the Basic Justification Tests 3-7
Table 3-6 Safety and Security Projects Proposals Requiring Additional ADO Review 3-8
Table 3-7 Minimum Useful Life 3-10
Table 3-8 Projects Where the FAA Has Determined if a BCA is Required 3-11
Table 3-9 BCA Process 3-12
Table 3-10 Eligible Off-Airport Projects 3-13
Table 3-11 Projects Requiring Intergovernmental Review 3-15
Table 3-12 Key Requirements for Intergovernmental Review 3-16
Table 3-13 Airport User Consultation Requirements 3-17
Table 3-14 Requirements for Grants that will Not Result in a Usable Unit of Work 3-18
Table 3-15 Examples of Acceptable and Unacceptable Grant Descriptions 3-18
Table 3-16 Examples of Modifications of Standards that Must Not be Considered for AIP Funded Projects 3-20
Table 3-17 Limited Circumstances Where Work Exceeding FAA Standards May be Funded with AIP 3-21
Table 3-18 Funding Examples for Work Exceeding FAA Standards 3-21
Table 3-19 Requirements for the Use of State Standards 3-23
Table 3-20 Required Content for Engineer's Reports 3-25
Table 3-21 Summary Table of Mandatory/Optional ADO Procurement Review 3-26
Table 3-22 ADO Review Requirements for Bid Protest and Appeals 3-29
Table 3-23 Additional Actions for Bid Protests that are a Federal Concern 3-30
Table 3-24 ADO Review Requirements for Bonding that Does Not Meet the Minimum Requirements 3-31
Table 3-25 Procurement Rules for Limited Noncompetitive Proposal Situations 3-32
Table 3-26 ADO Review Requirements for Contracts Containing Ineligible or Non-AIP Funded Work 3-35

Table 3-27 Examples of Being in the Federal Government's Best Interest 3-36
Table 3-28 Examples Where the Number of Potential Bidders May be Reduced 3-36
Table 3-29 Unique Consultant Contract Methods 3-37
Table 3-30 Typical Steps for an RSA Project with EMAS 3-38
Table 3-31 Circumstances Requiring OIG Notification 3-40
Table 3-32 Situations Where the ADO has the Option to Conduct a Pre-Award Review 3-41
Table 3-33 Sponsor Force Account Submittal Requirements 3-43
Table 3-34 Sponsor Force Account Documentation Requirements 3-43
Table 3-35 Other Sponsor Force Account Requirements 3-44
Table 3-36 ADO Requirements Regarding Suspension or Debarment 3-46
Table 3-37 Resources to Determine if a Project Cost is Necessary and Allowable 3-47
Table 3-38 Five Basic Requirements to Determine a Cost is Allowable 3-47
Table 3-39 Administrative Costs Examples and Requirements 3-49
Table 3-40 Requirements for Indirect Costs 3-51
Table 3-41 Allowability Examples for Architectural Treatments 3-52
Table 3-42 Drainage Proration Example 3-54
Table 3-43 Criteria for Energy Efficiency Improvement Costs 3-55
Table 3-44 Examples of Engineering and Architectural Costs 3-55
Table 3-45 Allowability of Costs to Rebuild or Relocate Facility Impeding an AIP Development Project 3-57
Table 3-46 Examples of Allowability of Costs for Facilities Impeding an AIP Project 3-60
Table 3-47 GIS Data Collection Cost Requirements 3-63
Table 3-48 Common Allowable Land Costs and Associated Restrictions 3-65
Table 3-49 Allowability of Costs for Facilities on AIP Acquired Land 3-67
Table 3-50 Requirements for Legal Fees and Settlement Costs 3-68
Table 3-51 Examples of Unallowable Costs Necessary to Carry Out a Project 3-69
Table 3-52 Examples of Project Formulation Costs 3-69
Table 3-53 Allowable SRM Costs 3-71
Table 3-54 Reasons for an ADO to find a Primary Power Supply Extremely Unreliable 3-71
Table 3-55 Allowability Examples of Site Preparation for Ineligible Facilities 3-72
Table 3-56 Spare Part Requirements 3-73
Table 3-57 Rules for Sponsor Furnished Materials or Supplies 3-74
Table 3-58 Examples of Allowable Temporary Construction 3-75
Table 3-59 Utility Costs Proration Example 3-77
Table 3-60 Rules for Reimbursing Project Costs Prior to the Grant Execution Date 3-78
Table 3-61 Sponsor Assumption of Risk 3-80
Table 3-62 Legislative Requirements that Must be Met for FAA to Consider Reimbursement Based on Climate-Related Conditions 3-80
Table 3-63 Implementation Requirements that Must be Met for FAA to Consider Reimbursement Based on Climate-Related Conditions 3-81
Table 3-64 Alternative Funding Requirements that Must be Met for FAA to Consider Reimbursement Based on Climate-Related Conditions 3-82
Table 3-65 Request Requirements that Must be Met for FAA Consideration of Reimbursement Based on Climate-Related Conditions 3-82
Table 3-66 APP-500 Acknowledgement Process for Requests for Reimbursement Based on Climate-Related Conditions 3-82
Table 3-67 Sponsor Requirements for Cost Reasonableness 3-84
Table 3-68 Documentation of ADO Cost Reasonableness Determinations 3-86
Table 4-1 AIP Funds by Category, Type, and Calculation 4-2
Table 4-2 Fiscal Year 2017 Final Funding Breakdown by Fund Type 4-7
Table 4-3 Airport Type Criteria and Potential Funding Types 4-8
Table 4-4 Airports that Can Use Each Fund Type 4-14
Table 4-5 Project Restrictions by Fund Type 4-19
Table 4-6 Expiration of AIP Funds 4-23
Table 4-7 Federal Share by Airport Type (Including Exceptions) 4-24
Table 4-8 Federal Shares by Airport Classification in Public Land States 4-28

Table 4-9 Requirements to Transfer Entitlement Funds between Airports....4-30
Table 4-10 Summary of Tables Containing Requirements for using Donations for the Sponsor's Share....4-33
Table 4-11 General Requirements for Offsetting the Sponsor Share of a Grant....4-33
Table 4-12 Value of Items Used to Offset the Sponsor Share....4-36
Table 4-13 Process to Offset the Sponsor Share of a Grant....4-37
Table 4-14 Example Calculations for Offsetting the Sponsor Share of a Grant....4-39
Table 4-15 Instances of Allowable Budget Augmentation....4-42
Table 5-1 The Basic Steps in the Grant Process....5-1
Table 5-2 The Major Pre-Grant Actions....5-2
Table 5-3 Important Potential Projects for ADO/Sponsor Discussion....5-3
Table 5-4 Common Key Steps in the Grant Process....5-4
Table 5-5 Sponsor Civil Rights Requirements....5-6
Table 5-6 Grant Application Contents....5-10
Table 5-7 Grant Offer Package....5-14
Table 5-8 Requirements for All Grant Agreement Types....5-15
Table 5-9 Specific Requirements by Grant Agreement Type....5-15
Table 5-10 Examples of Grant Descriptions....5-18
Table 5-11 Summary of Sponsor Certifications....5-21
Table 5-12 Examples of Actions Specifically Excluded from Sponsor Certification....5-22
Table 5-13 Steps and Requirements for Sponsor Grant Acceptance....5-23
Table 5-14 Types of Contract Changes....5-26
Table 5-15 Sponsor and ADO Requirements for Contract Changes....5-27
Table 5-16 Examples of Change Orders that Can and Cannot be Approved by the ADO for AIP Participation....5-28
Table 5-17 Examples of Changes to Professional Services Agreements that Can and Cannot be Approved by the ADO for AIP Participation....5-29
Table 5-18 Performance Report Requirements by Project Type....5-31
Table 5-19 Grant Payment Request Requirements and Limitations....5-32
Table 5-20 Conditions the Sponsor Must Meet for Advance Payments....5-35
Table 5-21 Situations Where an ADO Would Reduce or Withhold a Sponsor Payment Request....5-36
Table 5-22 Contract Retainage Limitations....5-37
Table 5-23 Examples of Improper Payments....5-38
Table 5-24 ADO Remediation Actions for Improper Payments....5-39
Table 5-25 Sponsor Remediation Actions for Improper Payments....5-39
Table 5-26 Criteria for an ADO to Amend a Grant....5-41
Table 5-27 Grant Amendment Limits for Increases....5-47
Table 5-28 Examples of Grant Amendments with Land Increases for a Nonprimary Airport....5-49
Table 5-29 Appropriate Amendment Formats....5-50
Table 5-30 Amendment Steps....5-51
Table 5-31 Project Physical Completion Requirements....5-53
Table 5-32 Grant Administration Closeout Requirements....5-54
Table 5-33 Closeout Processing Steps....5-56
Table 5-34 Block Grant Closeout Requirements....5-57
Table 5-35 Examples of Reasons for Grant Suspension or Termination....5-58
Table 5-36 Examples of Documents that a Sponsor Must Retain....5-61
Table 5-37 Requirements for AIP Audits by Entity....5-62
Table 5-38 Criteria for Disposing or Replacing AIP Funded Equipment....5-63
Table 5-39 Order of Precedence for Applying Sale Proceeds of AIP Funded Land....5-65
Table 6-1 LOI Funding Rules and Policy....6-1
Table 6-2 Three Overlapping Sets of Capital Data in the LOI Review....6-3
Figure 6-1 Three Overlapping Sets of Capital Data in the LOI Review....6-4
Table 6-3 LOI Project Criteria by Airport Type....6-5
Table 6-4 LOI Approval/Disapproval Process....6-7
Table 6-5 Sponsor LOI Submission Requirements....6-9
Table 6-6 Evaluation Criteria for LOI Requests....6-12

Table 6-7 LOI Offer Contents 6-13
Table 6-8 History of the State Block Grant Program 6-16
Table 6-9 State Block Grant Participants 6-17
Table 6-10 State Block Grant Application Information 6-18
Table 6-11 State Block Grant Selection Criteria 6-19
Table 6-12 Criteria for an Airport to be in the State Block Grant Program 6-20
Table 6-13 AIP Funding Transfer Rules for the State Block Grant Program 6-21
Table 6-14 MAP Requirements 6-25
Table 6-15 Examples of Projects That May Not Be Suitable for MAP Funding 6-28
Table 6-16 Innovative Finance Demonstration Program Legislative History 6-29
Table 6-17 Innovative Finance Demonstration Program Rules 6-29
Table 6-18 VALE Legislative References 6-31
Table 6-19 Zero Emission Vehicle and Infrastructure Pilot Program Legislative References 6-32
Table 6-20 Program to Increase the Energy Efficiency of Airport Power Sources Legislative References 6-33
Table 6-21 Rules for the Airport Development Rights Pilot Program 6-35
Table 6-22 Required Sponsor's Attorney Certification Language 6-38
Table 6-23 Requirements for the Instrument Recording the Purchase of Airport Development Rights 6-38
Table A-1 Definition of Terms Used in This Handbook A-1
Table B-1 References and Web Links B-1
Table C-1 Examples of General Prohibited Projects/Costs for All Project Types C-1
Table C-2 Examples of Prohibited Projects/Costs for Construction C-6
Table C-3 Examples of Prohibited Projects/Costs for Equipment C-14
Table C-4 Examples of Prohibited Projects/Costs for Land C-19
Table C-5 Examples of Prohibited Projects/Costs for Noise Mitigation C-19
Table C-6 Examples of Prohibited Projects/Costs for Planning or Environmental C-22
Table D-1 Miscellaneous Project Requirements D-1
Table E-1 Eligible Stand-Alone Planning Projects E-1
Table E-2 Planning Project Requirements E-4
Table F-1 New Airport Work Codes F-1
Table F-2 New Airport Project Requirements F-1
Table G-1 Runway Types and Eligibility G-1
Table G-2 Pavement Condition Index Requirements for Airfield Pavement Projects G-2
Table G-3 Distinctions between Construct, Extend, Widen, Strengthen, Rehabilitate, Shift, and Remove G-3
Table G-4 Runway Work Codes G-3
Table G-5 Runway Project Requirements G-4
Table H-1. Pavement Condition Index Requirements for Airfield Pavement Projects H-2
Table H-2 Distinctions between Construct, Extend, Widen, Strengthen, Rehabilitate, Shift, and Remove H-3
Table H-3 Taxiway Work Codes H-3
Table H-4 Taxiway Project Requirements H-4
Table I-1 Pavement Condition Index Requirements for Airfield Pavement Projects I-1
Table I-2 Distinctions between Construct, Expand, Strengthen, and Rehabilitate I-2
Table I-3 Apron Work Codes I-2
Table I-4 Apron Project Requirements I-3
Table J-1 Eligibility of Stand Alone-Projects for New and Faded Marking J-1
Table J-2 Eligibility of Stand-Alone Projects for Sign Panel Replacement J-2
Table J-3 Airfield Marking, Signage, and Lighting Work Codes J-3
Table J-4 Airfield Signage and Lighting Project Requirements J-4
Table K-1 NAVAID and Weather Reporting Equipment Work Codes K-3
Table K-2 NAVAID and Weather Reporting Equipment Project Requirements K-3
Table L-1 Requirements for Off-Airport Storage of ARFF Vehicles L-1
Table L-2 Safety and Security Equipment Project Requirements L-3
Table M-1 Other Equipment Project Requirements M-1

Table N-1 Public-Use Requirements for Terminal Buildings N-1
Table N-2 Movement of Passengers and Baggage Requirements N-2
Table N-3 Revenue Producing Eligibility and Conditions for Terminal Buildings N-3
Table N-4 Terminal Eligibility Proration Calculation N-4
Table N-5 Typical Eligible Areas/Equipment within a Terminal Building N-5
Table N-6 Additional Eligible Terminal Areas/Equipment at Nonhub Primary and Nonprimary Airports N-7
Table N-7 Terminal Building Funding Rules by Airport Type N-8
Table N-8 Terminal Work Codes N-10
Table N-9 Terminal Project Requirements N-11
Table O-1 Allowable Costs for Areas in an ARFF Building at 14 CFR part 139 Certificated Airports O-1
Table O-2 Distinctions between Construct, Expand, Modify, Improve, and Rehabilitate O-2
Table O-3 Other Building Project Requirements (Other than Terminals) O-3
Table P-1 Distinctions between Construct, Expand, Modify, Improve, and Rehabilitate P-1
Table P-2 Road and Surface Transportation Work Codes P-1
Table P-3 Roads and Surface Transportation P-2
Table Q-1 Good Title Requirements for Land and Easement Acquisition Q-2
Table Q-2 Types of Land Interests Q-3
Table Q-3 Land Work Codes Q-4
Table Q-4 Land Project Requirements Q-4
Table R-1 General Eligibility Requirements for Noise Compatibility Projects R-1
Table R-2 Block Rounding Requirements R-4
Table R-3 Requirements for Neighborhood Equity R-5
Table R-4 Pre- and Post-Testing Criteria for Noise Insulation Projects R-6
Table R-5 Noise Compatibility Planning/Project Work Codes R-9
Table R-6 Noise Compatibility Planning/Project Requirements R-9
Table S-1 Environmental Planning/Mitigation Project Requirements S-2
Table T-1 Distinctions between Construct, Expand, Modify, Improve, and Rehabilitate T-1
Table T-2 Military Airport Program Project Requirements (for typical projects) T-2
Table U-1 Sponsor Requirements Regarding Suspension or Debarment U-2
Table U-2 AIP Handbook Clarification of 2 CFR § 200.317 - Procurements by States U-3
Table U-3 AIP Handbook Clarification of 2 CFR § 200.318 - General Procurement Standards U-6
Table U-4 AIP Handbook Clarification of 2 CFR § 200.319 - Competition U-9
Table U-5 AIP Handbook Clarification of 2 CFR § 200.320 - Methods of Procurement to be Followed U-10
Table U-6 AIP Handbook Clarification of 2 CFR § 200.320(a) - Procurement by Micro-Purchases U-12
Table U-7 AIP Handbook Clarification of 2 CFR § 200.320(b) - Procurement by Small Purchase Procedures U-12
Table U-8 AIP Handbook Clarification of 2 CFR § 200.320(c) - Procurement by Sealed Bids (Formal Advertising) U-14
Table U-9 AIP Handbook Clarification of 2 CFR § 200.320(d) - Procurement by Competitive Proposals U-17
Table U-10 AIP Handbook Clarification of 2 CFR § 200.320(f) - Procurement by Noncompetitive Proposals 2 CFR § 200.320(f) - Procurement by Noncompetitive Proposals U-22
Table U-11 AIP Handbook Clarification of 2 CFR § 200.321, Contracting with Small and Minority Businesses, Women's Business Enterprises, and Labor Surplus Area Firms U-25
Table U-12 AIP Handbook Clarification of 2 CFR § 200.322 - Procurement of Recovered Materials U-26
Table U-13 AIP Handbook Clarification of 2 CFR § 200.323 - Contract Cost and Price U-27
Table U-14 AIP Handbook Clarification of 2 CFR § 200.324 - Federal Awarding Agency or Pass-Through Entity Review U-30
Table U-15 AIP Handbook Clarification of 2 CFR § 200.325 - Bonding requirements U-31
Table U-16 AIP Handbook Clarification of 2 CFR § 200.326 - Contract Provisions 2 CFR § 200.326 - Contract provisions U-34
Table V-1 Revenue Sources for the Airport and Airway Trust Fund V-1

Table W-1 Airports Falling Under the Competition Plan Requirements W-1
Table W-2 Completion Plan and Update Requirements W-2
Table W-3 Required Initial Competition Plan Content W-3
Table W-4 Required Competition Plan Update Content W-7
Table X-1 General Sponsor Buy American Requirements X-1
Table X-2 Criteria by Buy American Waiver Type X-2
Table X-3 Buy American Specific Definitions X-4
Table Y-1 Federally-Controlled Acreage in Public Land States Y-1
Table Y-2 Federal Shares by Airport Classification in Public-Land States Between 1970 and 1980 ..... Y-3
Table Y-3 Yes/No Test for Part 'b' Calculation Y-4
Table Y-4 Part 'b' Calculation Results (see Table Y-5 for columns marked *) Y-4
Table Y-5 Column Notes for Table Y-4 ..... Y-8
Table Y-6 Part 'c' Calculation Y-10

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Chapter 1. What do I need to know about this order?

1-1. This Order Is Called the *Handbook*.

Throughout this document, we refer to this order (FAA Order 5300-38D, Change 1, Airport Improvement Program Handbook) as the *Handbook*.

1-2. Purpose of the Handbook.

This Handbook provides guidance and sets forth policies and procedures for the Airport Improvement Program (AIP).

1-3. Handbook Audience.

All FAA organizations that work with the Airport Improvement Program will use this Handbook, in particular, the FAA Office of Airports (ARP) headquarters and field offices. This Handbook will also be publicly available to airports, consultants, state agencies and others associated with the Airport Improvement Program.

1-4. Handbook Location on the Internet.

You can find this Handbook on the FAA Office of Airports website (see Appendix B for link).

1-5. Publications this Handbook Cancels.

a. FAA Order 5100.38C, AIP Handbook, dated June 28, 2005.

b. FAA Order 5100.20C, Programming Control and Reporting Procedures Grant-In-Aid Program, dated December 7, 1999.

1-6. Relevant AIP Legislation (Referred to as the Act).

The contents of this Handbook are based on the AIP related legislation contained in the United States Code (USC). Throughout this Handbook, the AIP related legislation under Title 49 is referred to as the *Act.* This legislation is shown in Table 1-1. Previously, AIP was authorized by the Airport and Airway Improvement Act of 1982 (Public Law 97-248), which Congress repealed in 1994 and recodified as Title 49 § 47101, et seq. (Public Law 103-272).

14 CFR part 151 (Federal Aid to Airports) and 14 CFR part 152 (Airport Aid Program) were regulations for previous programs that existed prior to AIP and do not apply to AIP.

Table 1-1 AIP Related Legislation

The USC contains…	Which contains…	Which contains…	Which contains…	That Authorizes…	Under Sections (§)…
Title 49 (Transportation)	Subtitle VII (Aviation Programs)	Part B (Airport Development and Noise)	Chapter 471 (Airport Development)	The Airport Improvement Program	49 USC § 47101 through 49 USC § 47175 Most, but not all, sections within this range apply.
Title 49 (Transportation)	Subtitle VII (Aviation Programs)	Part B (Airport Development and Noise)	Chapter 475 (Noise)	Noise compatibility planning and projects	49 USC § 47501 through 49 USC § 47507 Most, but not all, sections within this range apply.
Title 49 (Transportation)	Subtitle VII (Aviation Programs)	Part C (Financing)	Chapter 481 (Airport and Airway Trust Fund Authorizations).	The FAA to have contract authority to issue grants	49 USC § 48103
Title 49 (Transportation)	Subtitle VII (Aviation Programs)	Part A (Air Commerce and Safety)	Chapter 445 (Facilities, Personnel, and Research)	The FAA to install an instrument landing system with AIP funds that can be turned over to the FAA for operation and maintenance	49 USC § 44502(e)

1-7. AIP Transition to 2 CFR part 200.

2 CFR part 200 became effective for AIP on December 19, 2014. This version of the Handbook contains the correct 2 CFR part 200 references and text. 2 CFR part 200 includes the requirements formerly contained in OMB Circular A-102 (administrative); OMB Circular A-87 (cost principles); and OMB Circulars A-89 and A-133 (audit requirements) for Federal awards. Available crosswalks between 2 CFR part 200 and these OMB circulars are listed in Table 1-2 (see Appendix B for link to the website containing these crosswalks). 2 CFR part 200 also includes the requirements formerly contained in 49 CFR § 18.36.

There are some differences between 2 CFR part 200 and AIP policy. On occasion, the AIP statute contains certain requirements (or lack thereof) which do not permit application of a part

of 2 CFR part 200. Wherever this occurs, it will be noted in this Handbook. Some of the differences occur where 2 CFR part 200 is addressing grant program administration. These differences are due principally because of the types of grant programs that are covered by 2 CFR part 200. Examples are included in Table 1-3. Some of the differences between AIP policy and 2 CFR part 200 are listed in Table 1-4.

Table 1-2 Crosswalk between 2 CFR part 200 and Previous OMB Circulars (see Appendix B for link to the website containing these crosswalks)

The following crosswalk…	Addresses the following AIP related policy…
a. Uniform Guidance Crosswalk from Predominant Source in Existing Guidance	Summary crosswalk for all OMB circulars (including A-89 which does not have detailed crosswalks)
b. Uniform Guidance Crosswalk to Predominant Source in Existing Guidance	Summary crosswalk for all OMB circulars in reverse order from above (including A-89 which does not have detailed crosswalks)
c. Uniform Guidance Cost Principles Text Comparison	Includes a detailed crosswalk for OMB Circular A-87
d. Uniform Guidance Audit Requirements Text Comparison	Includes a detailed crosswalk for OMB Circular A-133
e. Uniform Guidance Administrative Requirements Text Comparison	Includes a detailed crosswalk for OMB Circular A-102

Table 1-3 Examples of Differences Where 2 CFR part 200 is Addressing Grant Program Administration

Examples include…
a. The Federal Highway Administration (FHWA) issues grants for a state's grant programs. The state Departments of Transportation then issue subgrants and administer the FHWA grant funding (this is similar to the FAA AIP Block Grant Program).
b. AIP is a project grant program. AIP grants are written for a specific grant project. AIP grants do not allow a sponsor to use AIP to fund administration of the grant program, or to pay for sponsor overhead costs that are not specifically and directly related to a grant.

Table 1-4 Differences Between AIP Policy and 2 CFR part 200

AIP Policy (which governs)	2 CFR part 200	AIP Policy
Costs to recover improper payments are not allowable.	**2 CFR § 200.428** considers costs incurred recovering improper payments to be allowable costs. Costs to recover improper payments are part of grant program administration. AIP does not fund program administration. However, some Federal grant programs are allowed to use grant funds for administration. These agencies do not have any other source of local funds, and must use grant funds to recover improper payments.	**49 USC § 47110(b)(1)** indicates all costs paid with AIP funds must be *necessary* to carry out the project. It is the sponsor's responsibility to recover improper payments without using AIP funding to carry out the work effort.

1-8. Format for References to the Act.

Specific references to sections (§) of the Act are provided in the form of 49 USC § XXXXX. It is useful to note that the first three numbers in the section reference are always the chapter number.

1-9. Broad Objective of the Act.

The Act's broad objective is to help in developing a nationwide system of public-use airports that meets the current needs and the projected growth of civil aviation.

1-10. The Act is a *Permissive* Statute.

The key nature of the Act is that it is a *permissive statute*, rather than a mandatory or prohibitory one. Put more simply, if the AIP statute does not provide the authority to fund an action or an item, that action or item cannot be funded under AIP.

A permissive statute does not contain a comprehensive list of mandatory or prohibited actions. Rather, a permissive statute gives permission to do certain things. As such, an airport is not required to construct some or all of the items that are allowed under AIP, but may do so provided that the FAA determines that the items are justified at that airport.

This is not a concept exclusive to AIP. This is a rule that stems from Federal appropriations law, which applies to Federal agencies. The Government Accountability Office's (GAO) Principles of Federal Appropriations Law, Third Edition (commonly referred to as the Red Book) states that "A Federal agency is a creature of law and can function only to the extent authorized by law" (*Atlantic City Electric Co. v. Federal Energy Regulatory Commission*, 295 F.3d 1, (D.C. Cir. 2002)). The Supreme Court (*United States v. MacCollom*, 426 U.S. 317, 321 (1976)) has upheld this notion by stating "[T]he established rule is that the expenditure of public funds is

proper only when authorized by Congress, not that public funds may be expended unless prohibited by Congress."

1-11. Aviation Priorities in the Act.

49 USC § 47101 lists the policy directives and aviation priorities of the United States. These priorities include:

a. Providing a safe and secure airport and airway system.

b. Minimizing airport noise impacts on nearby communities.

c. Developing reliever airports, cargo hub airports, and intermodalism.

d. Protecting natural resources.

e. Reducing aircraft delays.

f. Converting former military air bases to civil use or improving joint-use airports.

g. Carrying out various other projects to ensure a safe and efficient airport system.

1-12. List of Handbook References (with Links to the Associated Websites).

Appendix B contains a list of the documents referenced in this Handbook. Links for these references are also provided in the Appendix B (they are not given again in the Handbook) and were current on the Handbook publication date. Each reference is also followed by a brief summary of what the document contains and how it relates to AIP. The versions of these reference documents are not given (use the current version of the document).

1-13. General Principles of this Handbook.

The contents of this Handbook are based on principles below:

a. The Use of the AIP Handbook is Mandatory. The Handbook is the published policy for AIP. Except where options are specifically noted or where non-mandatory language is used, the procedures and requirements are mandatory. The Director of the Office of Airport Planning and Programming (APP-1) must approve any deviation from the procedures or requirements. All requests for deviations must be sent to APP-1 for processing.

b. Use of the Term *FAA Policy*. The term *FAA policy* denotes policy that the FAA Office of Airports has established for AIP where there is not a direct statutory reference in the Act .

c. Regional Office Discretion. Unless set procedures are necessary to achieve national standardization in grant program administration, regional offices may adjust procedures that are not dictated by legislation, rule, this Handbook, other published Federal policy, or reasons beyond the FAA's control.

d. Reference to Other Guidance. The Handbook summarizes pertinent information from other guidance material when appropriate to relieve users from needing to reference another document. The source documents, rather than this Handbook, are the authoritative technical sources; however, this Handbook is the authoritative source on AIP, including eligibility.

1-14. Warning on Taking Handbook Text Out of Context.

There may be paragraphs in this Handbook that appear to conflict with the general requirements for eligibility, justification, or program administration. This is usually due to legislative exceptions for a specific project or location. These exceptions do not amend, change, or modify the general guidance and requirements. These exceptions do not apply to other situations and must not be taken out of context.

1-15. Use of the Term Airports District Office (ADO).

For the purposes of this Handbook, we are using ADO to reference the FAA Office of Airports office that directly works with the sponsor. In regional offices that do not have ADOs, the use of the term ADO refers to the FAA Office of Airports branch within the regional office that deals directly with the sponsors.

1-16. Use of the Phrase *ADO has the option*.

For the purposes of this Handbook, the phrase, *the ADO has the option* indicates situations where there is a choice to be made and that the ADO will make the choice.

1-17. FAA Office of Airports Positions/Divisions/Branches Referenced in this Handbook.

A list of the key positions within the FAA Office of Airports is contained in Table 1-5 and a list of the divisions and branches within the FAA Office of Airports is contained in Table 1-6. The routing codes for many of these positions, divisions, and branches are used throughout this Handbook.

Table 1-5 FAA Office of Airports Key Positions

Routing Code	Position Name
ARP-1	Associate Administrator
AAS-1	Director, Airport Safety and Standards
APP-1	Director, Airport Planning and Programming
ACO-1	Director, Airport Compliance and Management Analysis
AXX-600	Regional Division Manager (AXX meaning the regional designation of AAL, AEA, ACE, AGL, ANE, ANM, ASO, ASW, or AWP)

Table 1-6 FAA Office of Airports Divisions and Branches

Routing Code	Organization Name
AAS-100	Airport Engineering Division
AAS-300	Airports Safety and Operations Division
ACO-100	Airport Compliance Division
APP-400	Airport Planning and Environmental Division
APP -500	Airports Financial Assistance Division
APP-510	Financial Analysis and Passenger Facility Charge Branch
APP-520	Airport Improvement Program Branch

1-18. Location of Handbook Definitions.

Definitions are an important part of this Handbook. As with any large program, there are many words and phrases that have specific, defined meanings within the program. Appendix A contains the definitions of terms used in this Handbook.

1-19. Process for Handbook Changes.

APP-500 will continue to issue program guidance letters (PGLs) for short-term policy guidance between Handbook changes. In addition, APP-500 has the option to issue official numbered changes to the Handbook. The ADOs have the option to forward these PGLs to block grant state sponsors or others impacted by the PGLs.

1-20. Supplemental Guidance and Standard Operating Procedures.

The FAA Office of Airports has the option of issuing additional guidance, such as FAA Office of Airports Standard Operating Procedures (see Appendix B for link) as well as other formats, to supplement this Handbook. The ADOs have the option to forward the additional guidance to block grant state sponsors or others impacted by the guidance.

1-21. New Handbook Layout and Format.

The format of this version of the Handbook is significantly altered from the FAA Order 5100.38C, AIP Handbook.

a. Chapters. The chapters are reduced and are organized in question format as shown in Table 1-7. This allows the reader to more easily identify the chapter they need to reference.

b. Appendices. Detailed information and long lists were moved to the appendices to simplify the main body of the Handbook. For instance, while Chapter 3 provides the general requirements that each project must meet in order to be considered for AIP funding, the project specific requirements have been split out into appendices and are in tabular format for easier reference. Where a paragraph from an appendix is referenced, the reference will be in the form, Paragraph X-##. A list of the appendices is provided in Table 1-8.

Table 1-7 Handbook Chapters

Chapters in this handbook include…
Chapter 1. What do I need to know about this order?
Chapter 2. Who can get a grant?
Chapter 3. What projects can be funded?
Chapter 4. What AIP funding is available?
Chapter 5. How does the grant process work?
Chapter 6. What special AIP programs are available?

Table 1-8 Handbook Appendices

Appendices in this handbook include…
Appendix A. Definitions of Terms Used in this Handbook
Appendix B. References and Web Links
Appendix C. Prohibited Projects and Unallowable Costs
Appendix D. Miscellaneous Projects
Appendix E. Planning Projects
Appendix F. New Airport Projects
Appendix G. Runway Projects
Appendix H. Taxiway Projects
Appendix I. Apron Projects
Appendix J. Airfield Marking, Signage, and Lighting Projects
Appendix K. Navigational Aid (NAVAID) and Weather Reporting Equipment Projects
Appendix L. Safety and Security Equipment Projects
Appendix M. Other Equipment Projects
Appendix N. Terminal Building Projects
Appendix O. Other Building Projects
Appendix P. Roads and Surface Transportation Projects
Appendix Q. Land Projects
Appendix R. Noise Compatibility Planning/Projects
Appendix S. Environmental Planning/Mitigation Projects
Appendix T. Military Airport Program Projects
Appendix U. Sponsor Procurement Requirements (Including 2 CFR §§ 200.317-200.326 (formerly 49 CFR § 18.36))
Appendix V. Revenue Sources for the Airport and Airway Trust Fund
Appendix W. Competition Plans
Appendix X. Buy American Guidance
Appendix Y. Federal Share at Public Land State Airports
Appendix Z. Establishment and Category Upgrade Policy for Instrument Landing Systems (ILS)

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Chapter 2. Who can get a grant?

2-1. Grant Recipients are Referred to as Sponsors.

A recipient of an AIP grant is normally called a sponsor.

2-2. Type of Sponsors.

For AIP purposes, sponsors are broken down into the specific types shown in Table 2-1. This table also lists each of the entities that may qualify under each sponsor type.

Table 2-1 Types of Sponsors

For the following type of sponsor…	Only the following entities may qualify…
a. Airport sponsors	Public agency owning (or leasing from another government entity) a public-use airport. A state; a political subdivision of a state (such as a city, municipality, or state agency); a tax-supported organization; or an Indian tribe or pueblo are all considered public agencies. Private entity owning a public-use airport. State acting as a sponsor for one or more specific airports in the state. Indian tribe or pueblo owning or leasing a public-use airport. The Secretary of the Interior, during fiscal years 2012-2018 for Midway Island Airport per Section 186(d) of the Vision 100 – Century of Aviation Reauthorization Act (Public Law 108-176) as amended by Section 102 of Division M, Title I of the Consolidated Appropriations Act, 2018 (Public Law 115-141). The Republic of the Marshall Islands, Federated States of Micronesia, and Republic of Palau (or political subdivision) during fiscal years 2012-2018 (per 49 USC § 47115(j)).
b. Sponsors that are not currently airport owners (in the planning stages of acquiring or constructing the airport)	Public agency not owning or leasing a public-use airport.
c. Sponsors that are not currently airport owners (after the planning is complete and before the airport is open)	Public agency not owning or leasing a public-use airport.
d. Planning agency sponsors	Metropolitan planning agency. State planning agency. Council of governments.

Table 2-1 Types of Sponsors

For the following type of sponsor…	Only the following entities may qualify…
e. Noise compatibility project sponsors that are not airport owners	Public agency not owning or leasing a public-use airport.
f. State block grant sponsor	State approved by the FAA to be in the State Block Grant Program.
g. Sponsors for compatible land use *planning* or compatible land use *projects* per 49 USC § 47141	State or local government around Medium or Large Hub Airports (if the airport has not submitted a Noise Compatibility Program to the FAA or updated the Noise Compatibility Program within the past ten years).
h. Sponsors that are acquiring airport development rights from a privately-owned public-use airport under the pilot program in 49 USC § 47138(a)	State or a political subdivision of a state (such as a city, municipality, or state agency) in the same state as the airport.
i. Sponsors designated under 49 USC § 47118(h)	Federal agency owning an FAA designated safety critical airport.

2-3. Type of Projects Each Sponsor Type Can Receive in a Grant.

For each sponsor type, Table 2-2 lists the entities that qualify for that sponsor type and the types of projects they may receive in a grant.

Table 2-2 Types of Projects that May be Included in a Grant (by Sponsor Type)

For the following type of sponsor…	Only the following entities may qualify…	And may only receive grants for the following types of projects…
a. Airport sponsors	Public agency owning (or leasing from another government entity) a public-use airport. A state; a political subdivision of a state (such as a city, municipality, or state agency); a tax-supported organization; or an Indian tribe or pueblo are all considered public agencies. Private entity owning a public-use airport. State acting as a sponsor for one or more specific airports in the state. Indian tribe or pueblo owning or leasing a public-use airport. The Secretary of the Interior, during fiscal years 2012-2018 for Midway Island Airport per Section 186(d) of the Vision 100 – Century of Aviation Reauthorization Act (Public Law 108-176) as amended by Section 102 of Division M, Title I of the Consolidated Appropriations Act, 2018 (Public Law 115-141). The Republic of the Marshall Islands, Federated States of Micronesia, and Republic of Palau (or political subdivision) during fiscal years 2012-2018, per 49 USC § 47115(j).	Airport master planning Airport development Noise compatibility planning Noise compatibility projects *When a state is acting as a sponsor for more than one airport within the state, this is often referred to as a various locations grant.* *Note: Per Public Law 108-176, the Secretary of the Interior may only receive Airport Development grants for Midway Island.*
b. Sponsors that are not currently airport owners (in the planning stages of acquiring or constructing the airport)	Public agency not owning or leasing a public-use airport.	Planning grants associated with acquiring or establishing a public-use airport
c. Sponsors that are not currently airport owners (after the planning is complete and before the airport is open)	Public agency not owning or leasing a public-use airport.	Acquisition of existing airports Acquisition of land in anticipation of constructing a new airport Initial airport development
d. Planning agency sponsors	Metropolitan planning agency. State planning agency. Council of governments.	System planning

Table 2-2 Types of Projects that May be Included in a Grant (by Sponsor Type)

For the following type of sponsor…	Only the following entities may qualify…	And may only receive grants for the following types of projects…
e. Noise compatibility project sponsors that are not airport owners	Public agency not owning or leasing a public-use airport.	Noise compatibility planning Noise compatibility projects
f. State block grant sponsor	State approved by the FAA to be in the State Block Grant Program.	A state block grant for funds to be issued in subgrants to airports in the State Block Grant Program for: Airport master planning Airport development Noise compatibility planning Noise compatibility projects
g. Sponsors for compatible land use *planning* or compatible land use *projects* per 49 USC § 47141	State or local government around Medium or Large Hub Airports (if the airport has not submitted a Noise Compatibility Program to the FAA or updated the Noise Compatibility Program within the past ten years).	Compatible land use *planning* and compatible land use *projects*
h. Sponsors that are acquiring airport development rights from a privately-owned public-use airport under the pilot program in 49 USC § 47138(a)	State or a political subdivision of a state (such as a city, municipality, or state agency) in the same state as the airport.	Acquisition of airport development rights

Table 2-2 Types of Projects that May be Included in a Grant (by Sponsor Type)

For the following type of sponsor…	Only the following entities may qualify…	And may only receive grants for the following types of projects…
i. Sponsors designated under 49 USC § 47118(h)	Federal agency owning an FAA designated safety critical airport.	A project to preserve or enhance minimum airfield infrastructure if the project meets all of the following criteria: **(1)** The project is necessary to meet the minimum safety and emergency operational requirements established under 14 CFR part 139. **(2)** The project is necessary to support emergency diversionary operations for transoceanic flights in locations that meet the following criteria: **(a)** Locations within United States jurisdiction or control. **(b)** Locations where there is a demonstrable lack of diversionary airports within the distance or flight-time required by regulations governing transoceanic flights.

2-4. Grant Assurances – Definition and Which Ones to Use.

When airport owners or sponsors, planning agencies, or other organizations accept AIP funds, they must agree to certain obligations. These obligations are called grant assurances. The grant assurances require the recipients to maintain and operate their facilities safely and efficiently and in accordance with specified conditions, while some grant assurances state conditions that must occur before a grant is issued, or are specific to implementation of grant projects. These grant assurances are either included in the grant or are specifically incorporated by reference. The assurances are based on the legislation shown in Table 2-3.

Table 2-3 Statutory Basis for Grant Assurances

The following statutory reference…	Does the following…
49 USC § 47105	Gives the requirements for the FAA to approve a grant application.
49 USC § 47106	Permits the FAA to give a grant if the FAA is satisfied that a number of specific project requirements will be met.
49 USC § 47107	Requires the FAA to obtain written assurances from sponsors concerning current and future airport operations.

There are three sets of grant assurances (Airport Sponsors, Planning Agency Sponsors, and Non-Airport Sponsors Undertaking Noise Compatibility Program Projects) for AIP funded projects that are not issued through the State Block Grant Program. In addition, there are Aviation Block Grant Program Assurances that apply only to State Block Grant Program sponsors (see Paragraph 6-20). For each sponsor type, Table 2-4 lists the entities that qualify for that sponsor type, the types of projects they may receive a grant for, and the set of grant assurances they must follow.

The current versions of the assurances can be obtained from the FAA Office of Airports website (see AIP Grant Assurances link in Appendix B).

Table 2-4 Applicable Grant Assurances (by Sponsor and Project Type)

For the following type of sponsor…	Only the following entities may qualify…	And may only receive grants for the following types of projects…	And must follow this set of grant assurances…
a. Airport sponsors	Public agency owning (or leasing from another government entity) a public-use airport. A state; a political subdivision of a state (such as a city, municipality, or state agency); a tax-supported organization: or an Indian tribe or pueblo are all considered public agencies. Private entity owning a public-use airport. State acting as a sponsor for one or more specific airports in the state.	Airport master planning Airport development Noise compatibility planning Noise compatibility projects *Note: When a state is acting as a sponsor for more than one airport within the state, this is often referred to as a various locations grant.*	Airport Sponsors

Table 2-4 Applicable Grant Assurances (by Sponsor and Project Type)

For the following type of sponsor…	Only the following entities may qualify…	And may only receive grants for the following types of projects…	And must follow this set of grant assurances…
	Indian tribe or pueblo owning or leasing a public-use airport. The Secretary of the Interior, during fiscal years 2012-2018 for Midway Island Airport per Section 186(d) of the Vision 100 – Century of Aviation Reauthorization Act (Public Law 108-176) as amended by Section 102 of Division M, Title I of the Consolidated Appropriations Act, 2018 (Public Law 115-141). The Republic of the Marshall Islands, Federated States of Micronesia, and Republic of Palau (or political subdivision) during fiscal years 2012-2018 per 49 USC § 47115(j).		
b. Sponsors that are not currently airport owners (in the planning stages of acquiring or constructing the airport)	Public agency not owning or leasing a public-use airport.	Planning grants associated with acquiring or establishing a public-use airport	Planning Agency Sponsors
c. Sponsors that are not currently airport owners (after the planning is complete and before the airport is open)	Public agency not owning or leasing a public-use airport.	Acquisition of existing airports Acquisition of land in anticipation of constructing a new airport Initial airport development	Airport Sponsors
d. Planning agency sponsors	Metropolitan planning agency. State planning agency.	System planning	Planning Agency Sponsors

Table 2-4 Applicable Grant Assurances (by Sponsor and Project Type)

For the following type of sponsor…	Only the following entities may qualify…	And may only receive grants for the following types of projects…	And must follow this set of grant assurances…
e. Noise compatibility project sponsors that are not airport owners	Public agency not owning or leasing a public-use airport.	Noise compatibility planning Noise compatibility projects	Non-Airport Sponsors Undertaking Noise Compatibility Program Projects
f. State Block Grant Program sponsor	State approved by the FAA to be in the State Block Grant Program.	Planning Airport development Noise compatibility planning Noise compatibility projects	Aviation Block Grant Program *See Paragraph 6-20 to see how these relate to subgrant assurance obligations.*
g. Sponsors for compatible land use *planning* or compatible land use *projects* per 49 USC § 47141	State or local government around Medium or Large Hub Airports (if the airport has not submitted a Noise Compatibility Program to the FAA or updated the Noise Compatibility Program within the past ten years).	Compatible land use *planning* and compatible land use *projects*	Non-Airport Sponsors Undertaking Noise Compatibility Program Projects
h. Sponsors that are acquiring airport development rights from a privately-owned public-use airport under the pilot program in 49 USC § 47138(a)	State or a political subdivision of a state (such as a city, municipality, or state agency) in the same state as the airport.	Acquisition of airport development rights	None (per FAA policy)

Table 2-4 Applicable Grant Assurances (by Sponsor and Project Type)

For the following type of sponsor…	Only the following entities may qualify…	And may only receive grants for the following types of projects…	And must follow this set of grant assurances…
i. Sponsors designated under 49 USC § 47118(h)	Federal agency owning an FAA designated safety critical airport.	A project to preserve or enhance minimum airfield infrastructure if the project meets all of the following criteria: **(1)** The project is necessary to meet the minimum safety and emergency operational requirements established under 14 CFR part 139. **(2)** The project is necessary to support emergency diversionary operations for transoceanic flights in locations that meet the following criteria: **(a)** Locations within United States jurisdiction or control, or **(b)** Locations where there is a demonstrable lack of diversionary airports within the distance or flight-time required by regulations governing transoceanic flights.	None. 49 USC § 47118(h) specifically exempts these sponsors from normal AIP requirements.

2-5. Grant Assurances – Duration and Applicability.

The duration and applicability for each set of grant assurances (Airport Sponsor, Planning Agency Sponsor, Non-Airport Sponsors Undertaking Noise Compatibility Program Projects, and Aviation Block Grant Program) are listed in Table 2-5, Table 2-6, Table 2-7, and Table 2-8,

respectively. Note that the grant assurance numbers are different between these four sets of grant assurances.

Table 2-5 Duration and Applicability of Grant Assurances (Airport Sponsors)

Assurances that…	Include (by assurance # if applicable)…
a. Must be met before a grant is offered	#2 Responsibility and Authority of the Sponsor #3 Sponsor Fund Availability #4 Good Title #6 Consistency with Local Plans #7 Consideration of Local Interest #8 Consultation with Users #9 Public Hearings #12 Terminal Development Prerequisites
b. Apply until the grant is closed	#1 General Federal Requirements (except for 49 CFR part 23) #10 Air and Water Quality Standards #14 Minimum Wage Rates #15 Veteran's Preference #16 Conformity to Plans and Specifications #17 Construction Inspection and Approval #18 Planning Projects #32 Engineering and Design Services #33 Foreign Market Restrictions #34 Policies, Standards, and Specifications #35 Relocation and Real Property Acquisition
c. Apply for three years after the grant is closed	#13 Accounting System, Audit, and Record Keeping Requirements #26 Reports and Inspections

Table 2-5 Duration and Applicability of Grant Assurances (Airport Sponsors)

Assurances that…	Include (by assurance # if applicable)…
d. Apply for the useful life of the project (not to exceed 20 years from the grant acceptance date) except in the case of a land acquisition grant, for which the useful life is indefinite and the assurance obligations do not expire.	#5 Preserving Rights and Powers #11 Pavement Preventive Maintenance (This applies to all of the airfield pavement on the airport, not just the specific pavement in the grant.) #19 Operations and Maintenance #20 Hazard Removal and Mitigation #21 Compatible Land Use #22 Economic Nondiscrimination #24 Fee and Rental Structure #27 Use by Government Aircraft #28 Land for Federal Facilities #29 Airport Layout Plan #36 Access by Intercity Buses #37 Disadvantaged Business Enterprises (See 49 CFR parts 23 and 26, since certain program requirements may extend the obligation beyond the 20 year period, while the DBE requirements for the project apply until the project is closed.) #38 Hangar Construction #39 Competitive Access
e. Last for as long as the airport is owned and operated as an airport	#23 Exclusive Rights #25 Airport Revenue #30 Civil Rights #31 Disposal of Land

Table 2-6 Duration and Applicability of Grant Assurances (Planning Agency Sponsors)

Assurances that…	Include (by assurance # if applicable)…
a. Must be met before a grant is offered	#2 Responsibility and Authority of the Sponsor #3 Sponsor Fund Availability #5 Consistency with Local Plans

Table 2-6 Duration and Applicability of Grant Assurances (Planning Agency Sponsors)

Assurances that…	Include (by assurance # if applicable)…
b. Apply until the grant is closed	#1 General Federal Requirements (except for 49 CFR part 23) #4 Preserving Rights and Powers #7 Planning Projects #9 Civil Rights #10 Engineering and Design Services #11 Foreign Market Restrictions #12 Policies, Standards, and Specifications #13 Disadvantaged Business Enterprises (See 49 CFR parts 23 and 26, since certain program requirements may extend the obligation beyond the 20 year period)
c. Apply for three years after the grant is closed	#6 Accounting System, Audit, and Record Keeping Requirements #8 Reports and Inspections The three year duration for record keeping is a requirement of The Single Audit Act of 1984, Public Law 98-502 (as amended in 1996, Public Law 104-156, as amended and recodified at 31 USC § 7501 et seq.) and 2 CFR § 200.333-200.337.

Table 2-7 Duration and Applicability of Grant Assurances (Non-Airport Sponsors Undertaking Noise Compatibility Program Projects)

Assurances that…	Include (by assurance # if applicable)…
a. Must be met before a grant is offered	#2 Responsibility and Authority of the Sponsor #3 Sponsor Fund Availability #4 Good Title #6 Consistency with Local Plans #7 Consideration of Local Interest

Table 2-7 Duration and Applicability of Grant Assurances (Non-Airport Sponsors Undertaking Noise Compatibility Program Projects)

Assurances that…	Include (by assurance # if applicable)…
b. Apply until the grant is closed	#1 General Federal Requirements #9 Minimum Wage Rates #10 Veteran's Preference #11 Conformity to Plans and Specifications #12 Construction Inspection and Approval #18 Engineering and Design Services #19 Foreign Market Restrictions #21 Relocation and Real Property Acquisition
c. Apply for three years after the grant is closed	#8 Accounting System, Audit, and Record Keeping Requirements #16 Reports and Inspections
d. Apply for the useful life of the project (not to exceed 20 years from the grant issuance date) except in the case of a land acquisition grant, for which the useful life is indefinite and the assurance obligations do not expire.	#5 Preserving Rights and Powers #13 Operations and Maintenance #14 Hazard Prevention #15 Compatible Land Use #22 Disadvantaged Business Enterprises (See 49 CFR parts 23 and 26, since certain program requirements may extend the obligation beyond the 20 year period), while the DBE requirements for the project apply until the project is closed.
e. Last for as long as the airport is owned and operated as an airport	#17 Civil Rights #20 Disposal of Land

Table 2-8. Duration and Applicability of Grant Assurances (Aviation Block Grant Program)*

Assurances that…	Include (by assurance # if applicable)…
a. Must be met before a grant is offered	#7 State Resources
b. Apply until the grant is closed	#1 Incorporated in Grant Agreement #2 General Federal Requirements #6 Environmental Responsibilities
c. Apply for three years after the grant is closed	#3 Program Reporting
d. Last for as long as the state is in the Block Grant Program	#5 Compliance Requirements
e. Meets the duration of the following assurances: Airport Sponsors and Non-Airport Sponsors Undertaking Noise Compatibility Program Projects	#4 Obligated to Standard Assurances

* Block grant states must ensure that subrecipients are obligated to the applicable grant assurances by attaching the appropriate set(s) of grant assurances to each subgrant. In addition, block grant states that perform actions for the subrecipient that are beyond their block grant state administrative responsibilities must comply with all sponsor assurances associated with those actions.

2-6. Sponsor Qualification Criteria.

For an ADO to issue a grant, the FAA must first determine that the sponsor is able to assume the responsibilities defined in the grant. Details of this requirement are outlined in 49 USC § 47105, § 47106 and § 47107. The general sponsorship criteria are different for public agencies and private entities. The criteria for public agencies are listed in Table 2-9 and for private entities are listed in Table 2-10. Additional criteria, requirements, and considerations that apply to specific sponsorship situations are listed in Table 2-11. These requirements do not

apply to Federal agency sponsors of an FAA designated safety critical airport eligible under 49 USC § 47118(h).

Table 2-9 Legal and Financial Requirements for Public Agencies

The criteria are…
a. Per 49 USC § 47105(b)(2), a sponsor must be proposing a project for a public-use airport included in the current National Plan of Integrated Airport Systems (NPIAS).
b. Per 49 USC § 47106(a)(3), a sponsor must be financially able to assume and carry out the sponsor's duties in the AIP project application and grant agreements. This includes being able to finance the sponsor share of grants. Per FAA policy, if a public sponsor has an open grant from a Federal agency that requires compliance with 2 CFR part 200 Subpart E (OMB Circulars A-87, Cost Principles for State, Local, and Indian Tribal Governments and OMB Circulars A-102, Grants and Cooperative Agreements with State and Local Governments), this requirement is met. Otherwise, the ADO must work with ACO-100 to make this determination.
c. Per 49 USC § 47106(b)(1), the sponsor, another public agency, or the Federal government must have good title to the areas of the airport used or intended to be used for the landing, taking off, or surface maneuvering of aircraft. Per FAA policy, if the good title requirement is not met prior to the grant being issued, the acquisition of good title must be in process. Also per FAA policy, the sponsor can meet this good title requirement by leasing from another public agency that holds good title, provided that the duration of the lease is at least as long as the useful life of the project. (A lease from a private entity does not provide good title.)
d. Per 49 USC § 47106(a)(5), a sponsor must legally have the authority to act as a sponsor. The sponsor must not be encumbered by any existing agreements that would prevent it from acting as a sponsor. Legal authority to be a public sponsor comes from its state authorizing legislation, also called state enabling legislation. The authorizing legislation must clearly provide the sponsor the authority to carry out the obligations and responsibilities of sponsorship. Per FAA policy, the sponsor must provide a copy of the state authorizing legislation to the ADO prior to the sponsor applying for its first grant. Per FAA policy, the ADO has the option to require an opinion from the sponsor's attorney regarding whether the sponsor has the legal authority to act as a sponsor.
e. Per 49 USC § 47106(d), if a sponsor has previously received a grant, the sponsor must be in compliance with its current grant obligations. The ADO and regional office must obtain a list of the sponsors that are not in compliance from ACO-100.
f. Per 49 USC § 47107(d), the sponsor must be able to maintain and operate the airport as a public-use airport to FAA standards.
g. Per 2 CFR part 180, a sponsor must not be suspended or debarred by the Federal government.

Table 2-10 Legal and Financial Requirements for Private Entities

The criteria are…
a. Per 49 USC § 47105(b)(2), a sponsor must be proposing a project for a public-use airport included in the current National Plan of Integrated Airport Systems (NPIAS).
b. Per 49 USC § 47102(26)(B), the sponsor must be the private owner of a public-use airport. 49 USC § 47102(22)(B) defines a privately-owned airport as a public use airport if it is used or intended to be used for public purposes and meets one of the following conditions: **(1)** Is a reliever airport. The FAA defines which airports are privately owned reliever airports in the current version of FAA Order 5090.3, Field Formulation of the National Plan of Integrated Airport Systems (NPIAS). **(2)** The FAA has determined that the airport has at least 2,500 passenger boardings each year and receives scheduled passenger aircraft service.
c. Per 49 USC § 47106(b), the sponsor must have good title to the airport property. Per FAA policy, if the good title requirement is not met prior to the grant being issued, the acquisition of good title must be in process. Also per FAA policy, the sponsor can meet this good title requirement by leasing from a public agency that holds good title, provided that the duration of the lease is at least as long as the useful life of the project.
d. Per 49 USC § 47107(d), the sponsor must be able to maintain and operate the airport as a public-use airport to FAA standards.
e. Per 49 USC § 47106(a)(3), a sponsor must be financially able to assume and carry out the sponsor's duties in the AIP project application and grant agreements. If a private sponsor can provide documentation that a certified public accounting firm has determined they are financially able to assume and carry out the sponsor duties, this requirement has been met. The certified public accounting firm must have reviewed the sponsor's financial documentation and affirmed the sponsor has sufficient funds on hand, or a combination of funds and agreements with airport tenants, that will provide adequate income to finance the sponsor share and costs of operating/maintaining the airport for at least 10 years in the future. Otherwise, the ADO must have obtained concurrence from ACO-100 to proceed.
f. Per 49 USC § 47106, a sponsor must legally have the authority to act as a sponsor. The sponsor must not be encumbered by any existing agreements that would prevent it from acting as a sponsor. The ADO may require an opinion of the sponsor's attorney of its legal authority to act as a sponsor and carry out its responsibilities under the grant agreement.
g. Per 49 USC § 47106(d), if a sponsor has previously received a grant, the sponsor must be in compliance with its current grant obligations. The ADO and regional office may obtain a list of the sponsors that are not in compliance from ACO-100.
h. Per 2 CFR part 180, a sponsor must not be suspended or debarred by the Federal government.

Table 2-11 Additional Criteria, Requirements, and Considerations for Specific Sponsorship Situations

For the following sponsorship situation…	The additional criteria, requirements, and considerations apply…
a. A state acting as a sponsor for one or more specific airports (*Note: When a state is acting as a sponsor for more than one airport within the state, this is often referred to as a various locations grant.*)	**(1)** 49 USC § 47105(a)(1)(B) allows state sponsorship of development and planning projects for one or more airports provided: **(a)** The sponsor of each airport consents in writing to the state sponsorship. **(b)** There is administrative merit and aeronautical benefit to the state sponsorship. Per FAA policy, the ADO makes this determination. **(c)** There is written documentation that the state will comply with the required grant conditions and assurances. Per FAA policy, the ADO makes this determination. **(2)** 49 USC § 47102(27) defines a state as a state of the United States, the District of Columbia, Puerto Rico, the Virgin Islands, American Samoa, Guam, and the Trust Territory of the Pacific Islands (Republic of the Marshall Islands, the Federated States of Micronesia, the Commonwealth of the Northern Mariana Islands, the Republic of Palau). **(3)** This sponsorship type is not the State Block Grant Program. **(4)** The state must provide the signed copy of FAA Form 5100-128, Agreement on State Sponsorship and Airport Sponsor Obligations (see the AIP Forms link in Appendix B) to the ADO with the grant application and the ADO must approve or disapprove any changes or addendum to the agreement.
b. A state approved by the FAA to be in the block grant program	**(1)** State block grant sponsorship is restricted to states selected for the State Block Grant Program as discussed in Section 2 of Chapter 6. **(2)** Under the State Block Grant Program, the state is the sponsor. The state then issues subgrants to the airports that are included in the program.
c. A public agency not owning or leasing a public-use airport	**(1)** During the acquisition or establishment of an airport, the regional division manager must have made two separate sponsor designations. **(2)** First, the regional division manager may designate a public agency as a sponsor for a planning grant to acquire or establish a public-use airport. **(3)** Second, if the regional division manager, ADO, and the sponsor decide to continue with the airport acquisition or establishment, the regional division manager must separately designate that the sponsor is legally and financially able to assume the responsibilities of a sponsor. This is because the Planning Agency Sponsors Assurances are less extensive than the Airport Sponsors Assurances.

Table 2-11 Additional Criteria, Requirements, and Considerations for Specific Sponsorship Situations

For the following sponsorship situation…	The additional criteria, requirements, and considerations apply…
d. A metropolitan planning agency or a state planning agency	**(1)** A planning agency sponsor must be authorized by the laws of the state (or states or political subdivisions concerned) to engage in area-wide planning for the areas in which the grant funding is to be used. **(2)** Typical state agencies that may qualify as a planning agency sponsor are planning offices, aeronautics commissions, and departments of transportation. **(3)** Typical metropolitan planning agencies include metropolitan planning organizations, councils of government, and regional planning commissions.
e. Entities acting as sponsor agents (including channeling act states)	**(1)** A public agency may act as an agent of the sponsor without being considered a co-sponsor. These agents are not true sponsors or co-sponsors, but they do play a role in the AIP grant process. **(2)** Channeling is the most common type of agent agreement. State channeling of Federal airport grants occurs in various forms within numerous states. Normally, when an airport is in a channeling act state, the sponsor submits payment request information to the state, who then submits the request to the FAA. In this case, the FAA makes payments to the state, and the state then distributes the payment to the sponsor. In some cases, the state may also provide technical oversight and review, which may include state submittal of grant applications and/or closeout requests. This is based on state enabling legislation, rather than Federal law. In many cases, the state also signs the grant agreements. Channeling agreements based on state enabling legislation do not need approval from the ADO. **(3)** Except for channeling act agreements, other agent-sponsor agreements require prior ADO review and regional division manager approval in order to be valid. These agreements are rare and must include the terms, conditions, powers, responsibilities, and relationship of the agent to the sponsor. The agreement may be in the form of a resolution or ordinance, and a copy of the agreement, along with regional division manager's concurrence, must be kept on file in the ADO.

Table 2-11 Additional Criteria, Requirements, and Considerations for Specific Sponsorship Situations

For the following sponsorship situation…	The additional criteria, requirements, and considerations apply…
f. Two or more entities acting as co-sponsors	**(1)** The FAA has determined that the public agencies either independently (or jointly) meet the sponsorship requirements. The ADO agrees to the co-sponsorship by issuing the grant. **(2)** Each of the co-sponsors is individually bound to the terms and conditions of the grant agreement unless their respective rights and obligations are otherwise set forth in a written agreement. The agreement must, as a minimum, set forth: **(a)** The responsibilities of each cosponsor to the other(s) with respect to the accomplishment of the proposed development, operation, and maintenance of the airport; **(b)** The obligations which each will assume to the United States: **(c)** The names of the sponsor or sponsors who will accept the grant agreement; and **(d)** The names of the sponsor or sponsors who will accept receipt of and disburse grant payments. **(3)** Channeling act states are not considered to be co-sponsors, they are sponsor agents even if they sign the grant agreement. **(4)** Any two or more public agencies may submit a request to the FAA to co-sponsor a project. The FAA will consider the relationship of the proposed cosponsors to the airport. **(5)** The FAA is not a party to a co-sponsorship agreement. Therefore, disagreements between co-sponsors must be addressed at a local or state level, as appropriate.
g. Sponsors for compatible land use *planning* or compatible land use *projects* per 49 USC § 47141	**(1)** The sponsor has authority to plan and adopt land use compatibility plans and control measures, including zoning, in the planning area in and around the airport. **(2)** The sponsor and the airport must enter into a written agreement to prepare the compatible land use plan cooperatively.
h. Sponsors that are acquiring airport development rights from a privately-owned public-use airport under the pilot program in 49 USC § 47138(a)	**(1)** The additional sponsor requirements are contained in Section 8 of Chapter 6, which covers the airport development rights pilot program.

2-7. State Sponsorship Benefits.

One of the benefits of having a state act as a sponsor for more than one airport (like for various location grants) is that it may reduce ADO, state, or sponsor workload by combining multiple grants into one. It may also provide economies of scale through state sponsorship. For instance, equipment can be acquired in quantity at potentially lower unit cost, several small and similar construction projects can be accomplished or related airport master plans or airport layout plans can be prepared. Co-sponsorship of projects between the airport and the state remains an alternative to this procedure if the airport, the state and ADO believe this to be more efficient.

2-8. Sponsorship Determination Process.

The FAA Office of Airports is responsible for making sponsor determinations for AIP. The process differs by entity type as outlined below. For Federal agency sponsors of an FAA designated safety critical airport eligible under 49 USC § 47118(h), this determination will be made by APP-1.

a. Public Agencies. Per the current version of FAA Order 1100.145, Delegations of Authority, Appendix 4, the regional division manager is delegated to take actions with respect to their function and assigned responsibilities, which are detailed in the current version of FAA Order 1100.5, FAA Organization – Field. These responsibilities include making sponsorship determinations for public agencies. The regional division manager may document their determination in one of two ways. First, the regional division manager may make a written designation of sponsorship prior to issuing a grant. Second, if there is no controversy or complexity, the regional division manager may make an implicit determination by allowing the ADO to issue a grant to the proposed sponsor. The FAA has determined that it is preferable to have a written determination of sponsorship prior to the regional division manager issuing the first grant to a new sponsor. Therefore, for determinations made by the regional division manager after the publication of this Handbook, the regional division manager must make a written determination prior to issuing the first grant to the new sponsor. The regional division manager and ADO may contact APP-500, ACO-100, or regional legal counsel for assistance with these sponsorship determinations.

b. Private Entities. APP-1 makes the sponsorship determination for a private entity. APP-1 must have made a written designation of sponsorship prior to the ADO issuing the first grant (an implicit determination is not an option).

c. Public Private Entities. In addition, a sponsor may also fall in the rare public-private sponsorship category. This is where an airport privatizes some, but not all, of the management of the airport. In this case, the regional division manager and ADO must consult ACO-100 and APP-500 for direction on how to proceed. APP-1 must have made a written designation of sponsorship prior to the ADO issuing the first grant (an implicit determination is not an option).

2-9. Transfer of Sponsorship.

In order for an existing sponsor to transfer the sponsorship of an obligated airport to another entity, the sponsor must obtain pre-approval from the FAA. Per the current version of FAA Order 5190.6, FAA Airport Compliance Manual, the existing sponsor must first obtain

ARP-1 pre-approval to release the entire airport. Then the FAA must make a sponsorship determination for the new entity as discussed in Paragraph 2-8. The existing sponsor cannot transfer sponsorship unless ARP-1 approves the release of the airport and the FAA makes a positive sponsorship determination for the new sponsor. The ADO must refer to the current version of FAA Order 5190.6, FAA Airport Compliance Manual for specific sponsor transfer requirements, including the willingness of the sponsor to take on the applicable grant assurances and obligations.

The ADO and regional office must contact APP-500 and ACO-100 to determine the current process prior to initiating the review of a sponsorship transfer request.

2-10. Conflicting Grant Requests from More than One Entity.

Where more than one entity applies for a grant for the same or similar project, and where identification of the appropriate agency empowered to do the project is not clear, the regional division manager will designate the eligible applicant based on which one is best equipped to do the project. This is a rare situation and is generally related to a planning project. APP-400 can provide assistance to the regional division manager and the ADO in these cases.

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Chapter 3. What projects can be funded?

Section 1. List of 16 Requirements for Project Funding.

3-1. List of 16 Requirements for Project Funding.

A project must meet the 16 general requirements listed in Table 3-1 in order for the ADO to consider it for AIP funding. The ADO must not approve projects that do not meet these requirements. The remaining sections of this chapter discuss each of these 16 general requirements in greater detail.

Table 3-1 The 16 General Requirements for Project Funding

The general requirements are…	As found in…
a. Is the project eligible?	Section 2
b. Is the project justified?	Section 3
c. Is the project on airport property (with good title)?	Section 4
d. Is the project on the FAA approved airport layout plan?	Section 5
e. Has the sponsor satisfied the intergovernmental review and airport user consultation requirements?	Section 6
f. Has the FAA completed an environmental finding for the project?	Section 7
g. Will the project result in a usable unit of work?	Section 8
h. Will the project be planned, designed, and/or constructed to FAA standards?	Section 9
i. Has the project been procured correctly?	Section 10
j. Are the project costs allowable?	Section 11
k. Are the project costs necessary to accomplish the project (Allowable Rule #1)?	Section 12
l. Were the project costs incurred after the grant was executed (Allowable Rule #2)?	Section 13
m. Are the project costs reasonable (Allowable Rule #3)?	Section 14
n. Is this the only Federal grant containing these project costs (Allowable Rule #4)?	Section 15
o. Are the project costs within the allowable Federal share (Allowable Rule #5)?	Section 16
p. Can the project be completed without unreasonable delay?	Section 17

Section 2. Project Eligible.

3-2. The Act Establishes the General Types of Eligible Projects.

The Act identifies the general types of projects that may be funded with AIP, which are airport planning, airport development, noise compatibility planning, and noise compatibility projects (see 49 USC § 48103).

Only these types of projects are eligible and can be funded. The Federal Appropriations Law prohibits the ADO from funding ineligible projects (as discussed in Paragraph 1-10). If this Handbook does not list a project as eligible, the ADO *must* receive an eligibility determination from APP-500 in order to proceed with the project. This effort will maintain consistency on a national basis.

However, just because a project is eligible under the Act, it does not mean that the ADO can fund the project. The project *must* meet the other requirements further outlined in this chapter.

3-3. Project Requirement Tables (in the Appendices by Project Type).

The tables in the appendices contain project specific requirements for projects that are eligible under the Act. These tables have been broken out into the appendices for ease of use. ADOs *must not* use these appendices independently. They must also apply the 16 general project requirements outlined in this chapter to determine if a project can be funded with AIP.

3-4. Prohibited Project and Unallowable Cost Tables.

Appendix C contains tables that the ADO can use to help determine if the FAA has previously identified a project or cost to be ineligible or unallowable.

3-5. Only Specific Equipment is Eligible under the Act.

49 USC § 47102(3) lists the specific pieces of equipment eligible under AIP. No other pieces of equipment (including associated computer hardware or software for the equipment) are eligible unless AAS-1 has made a written determination that the equipment will contribute significantly to airport safety or security.

3-6. Eligibility of Maintenance, Rehabilitation, Reconstruction, and Replacement Projects.

These concepts cause much confusion. The goal for all of the actions above is to obtain a functioning unit as the final outcome. What differentiates these concepts is the level of effort and the resulting change in useful life. As the work effort for a category increases, the question of whether the work belongs in the category surfaces (for example, determining when timely maintenance is actually rehabilitation.) As a result, the conclusion of which category the project falls into rests with the specific circumstances. Table 3-2 explains the differences between these concepts and Table 3-3 provides eligibility examples.

Table 3-2 Differences between Maintenance, Rehabilitation, Reconstruction, and Replacement Projects

Item	Explanation	Eligibility
a. Maintenance (including minor repair)	Maintenance includes any regular or recurring work necessary to preserve existing airport facilities in good condition, any work involved in the care or cleaning of existing airport facilities, and any incidental or *minor* repair work on existing airport facilities. Minor repair is a stopgap measure taken by a sponsor to keep a facility operational until the sponsor can complete a rehabilitation, reconstruction, or replacement project. Replacing individual parts and mending portions of a facility are considered minor repair.	Maintenance work is not airport development as defined in the Act. Therefore, it is not eligible for AIP funding except for one specific situation. 49 USC § 47102(3)(H) provides the exception for routine runway, taxiway, or apron maintenance at nonhub primary airports and nonprimary airports. Typical runway, taxiway, or apron maintenance includes routine cleaning, filling, and or sealing of longitudinal and transverse cracks; grading pavement edges; maintaining pavement drainage systems; patching pavement; and remarking pavement areas.
b. Rehabilitation	Rehabilitation is a more comprehensive restoration of an original functionality that results in a piece of pavement, piece of equipment, or building with a useful life of at least 10 years, or half of the useful life per Table 3-7, whichever is less. This approach deals with the facility or item as a whole and is more far-reaching than the minor repair discussed under maintenance.	Rehabilitation is generally eligible (but must still be justified).
c. Reconstruction	Reconstruction is a complete restoration of an original functionality that results in a virtually new piece of pavement, piece of equipment, or building with a use life as listed in Table 3-7.	Reconstruction is generally eligible (but must still be justified).

Table 3-2 Differences between Maintenance, Rehabilitation, Reconstruction, and Replacement Projects

Item	Explanation	Eligibility
d. Replacement (including replacement of damaged equipment)	Replacement is building a complete new facility or replacing a whole new piece of equipment that has reached the end of its useful life.	Replacement is generally eligible (but must still be justified) provided; **(1)** The facilities or equipment was destroyed, become obsolete, worn out, or otherwise deemed inoperable through no fault of the sponsor under normal use. An example of this may be replacement of Engineered Materials Arresting System (EMAS) panels that were destroyed by an aircraft, only if the sponsor can prove that there is no other avenue, such as insurance, for funding the replacement. **(2)** The sponsor has determined that there are no other avenues for replacement (such as through insurance or by another Federal agency responsible for such disasters).

Table 3-3 Examples of Maintenance, Rehabilitation, Reconstruction, and Replacement Projects

The following project of…	Is considered…	And is…
a. Applying a herbicide on cracks in asphalt pavement	Maintenance	Not eligible at any airport
b. Changing fluid on a scheduled basis to keep a vehicle's engine and parts functional	Maintenance	Not eligible at any airport
c. Mowing the airfield grass	Maintenance	Not eligible at any airport
d. Sweeping airfield pavement	Maintenance	Not eligible at any airport
e. Re-topping trees for approach protection if this work was previously completed in an AIP grant	Maintenance	Not eligible at any airport
f. Replacing airfield light bulbs	Maintenance	Not eligible at any airport
g. Replacing runway lighting fixtures due to snow plow damage	Maintenance	Not eligible at any airport

Table 3-3 Examples of Maintenance, Rehabilitation, Reconstruction, and Replacement Projects

The following project of…	Is considered…	And is…
h. Replacing a component of an existing eligible equipment or system. Examples include replacement of a regulator for an airfield lighting circuit; replacement of a transmission in an Aircraft Rescue and Firefighting (ARFF) truck; and replacement of a sensor for an AWOS system.	Maintenance	Not eligible at any airport
i. Replacing carpeting (or other flooring, such as tiles or terrazzo), painting, wall coverings, doors or ceiling tiles in a terminal not required as a result of an eligible terminal project	Maintenance	Not eligible at any airport
j. Replacing public-use seating (including fixed tables and counters) in a terminal that is bolted or affixed to the terminal wall or floor, if the replacement is not associated with a larger terminal project.	Maintenance	Not eligible at any airport
k. Replacing small sections of roofing in terminals and airport buildings	Maintenance	Not eligible at any airport
l. Replacing faded sign panels	Maintenance or incidental costs, depending on the situation	See Paragraph J-3 for details.
m. Minor work or repair on a turf or aggregate runway	Maintenance	Eligible at a nonhub primary airports or nonprimary airport (subject to adequate justification)
n. Performing spall repair, crack sealing, or repair of a small portion of the total taxiway, runway or apron pavement	Maintenance	Eligible at a nonhub primary airports or nonprimary airport (subject to adequate justification)
o. Applying seal coats or slurry seal, or resealing of joints for a major portion of a taxiway, runway or apron pavement	Rehabilitation	Eligible at any airport (subject to adequate justification)
p. Rehabilitation of a turf or aggregate runway	Rehabilitation	Eligible at any airport (subject to adequate justification)
q. Replacing panels and replacing all joint seal material on concrete pavement to obtain at least 10 years of useful life	Rehabilitation	Eligible at any airport (subject to adequate justification)

Table 3-3 Examples of Maintenance, Rehabilitation, Reconstruction, and Replacement Projects

The following project of…	Is considered…	And is…
r. Milling and repaving an apron to obtain at least 10 years of useful life	Rehabilitation	Eligible at any airport (subject to adequate justification)
s. Completely renovating the terminal restrooms	Rehabilitation	Eligible at any airport (subject to adequate justification)
t. Performing lid rehabilitation for Engineered Material Arresting System (EMAS) blocks installed with AIP funds prior to fiscal year 2007 (after fiscal year 2007, the manufacturer began fully encasing the blocks, eliminating the need for lid replacement)	Rehabilitation	Eligible at any airport (subject to adequate justification)
u. Bringing a runway down to its subgrade and completely repaving it	Reconstruction	Eligible at any airport (subject to adequate justification)
v. Replacement of sign panels required by a change in airfield geometry or new sign panel specifications	Replacement	Eligible at any airport (subject to adequate justification)
w. Purchasing an ARFF vehicle to replace one paid for with AIP funding	Replacement	Eligible at any airport (subject to adequate justification)
x. Replacement of damaged Engineered Material Arresting System (EMAS) panels that were damaged by an aircraft and the sponsor can prove that there is no other avenue for funding the replacement, such as the aircraft owner's or sponsor's insurance	Replacement	Eligible at any airport (subject to adequate justification)
y. Replacement of terminal escalators	Replacement	Eligible at any airport (subject to adequate justification)

3-7. Difference between AIP and Passenger Facility Charge (PFC) Eligibility.

While closely related, there are differences between project eligibility between AIP and the PFC program. These differences are discussed in the current version of FAA Order 5500.1, Passenger Facility Charge.

Section 3. Project Justified.

3-8. Three Basic Tests for Project Justification.

The ADO must apply the three basic tests in Table 3-4 to determine if a project is justified. The ADO must not fund projects or project elements that are not justified based on the following three tests. Table 3-5 contains examples where one or more of the following tests are not met.

Table 3-4 Three Basic Tests to Determine if a Project is Justified

The three basic tests to determine if a project is justified are…
a. The Project Advances an AIP Policy. The ADO must verify that the project advances at least one of the AIP policies contained in 49 USC § 47101. The basic goals and objectives in these policies include airport safety, airport security, airport capacity, meeting an FAA standard, preserving airport infrastructure through reconstruction or rehabilitation, protecting and enhancing the environment, minimizing aircraft noise impacts, and airport planning. AIP funds must not be used for a project that does not specifically advance one of the AIP policies.
b. There is an Actual Need. Per FAA policy, the ADO must determine if there is an actual need for the project at the airport within the next five years (per the definition near-term development per the current version of Advisory Circular 150/5070-6, Airport Master Plans). This includes all subcomponents of the project.
c. The Project Scope is Appropriate. The ADO must determine that only the elements that are required to obtain the full benefit of the project are included in the project scope. Any elements that do not meet these criteria must stand on their own separate merit and justification. The current version of FAA Order 5100.39, Airports Capital Improvement Plan, discusses this concept in further detail in the discussions on overall development objective.

Table 3-5 Examples of Projects Not Meeting the Basic Justification Tests

For the following situation…	Is not justified because…
a. A sponsor has a runway shown on their ALP and would like to build it to increase capacity. However, the airport already has adequate capacity and will continue to have adequate capacity in the foreseeable future.	This project does not advance an AIP policy. The actual need does not exist.
b. A sponsor would like to build a runway extension to attract a new class of aircraft or for marketing purposes. In this case, the need is speculative and not based on documented future need.	The actual need does not exist.
c. A sponsor would like include dorm rooms and day rooms in an ARFF building expansion for an airport with a class of certification that does not require 24/7 ARFF personnel.	This project scope is not appropriate.

Table 3-5 Examples of Projects Not Meeting the Basic Justification Tests

For the following situation…	Is not justified because…
d. A sponsor would like to replace its existing asphalt pavement with concrete even though the pavement section has existing useful life.	The actual need does not exist.

3-9. Justification Requirements for Safety and Security Projects.

Safety and security projects are not automatically justified. In all cases, the ADO must review these projects to determine if the project meets the eligibility and justification requirements outlined in this Handbook. Safety and security projects that require additional review by the ADO include, but are not limited to, those listed in Table 3-6.

Table 3-6 Safety and Security Projects Proposals Requiring Additional ADO Review

Examples of proposals that require additional ADO review for eligibility and justification…
a. A proposal that addresses a14 CFR part 139 violation
b. A written recommendation by a 14 CFR part 139 certification inspector
c. A proposed runway incursion prevention measure
d. A Runway Safety Action Team recommendation
e. An item included in an Airport Emergency Plan
f. An item included in an Airport Certification Manual
g. An item included in a wildlife hazard assessment (or associated wildlife hazard management plan) or wildlife hazard site visit (or associated written sponsor adoption of the site visit recommendations).
h. An item included in an airport's approved 49 CFR part 1542 security program (typically eligible security projects are included in Appendix L and Appendix N and the commonly requested security projects that have been determined ineligible are included in Appendix C).

3-10. Justification Requirements for Unclassified Airport Projects.

Very-low activity nonprimary airports that are not classified as National, Regional, Local, or Basic airports in the latest edition of the FAA Asset or the latest NPIAS report are designated as *unclassified* airports. Because these airports are low-activity, the only projects for which these airports are justified are: projects to rehabilitate the airport's existing primary runway pavement

at a frequency not to exceed 10 years; a one-time project to remove obstructions from each end of the primary runway; and runway maintenance projects allowed per 49 USC § 47102(3)(H).

Other projects, including those needed to correct design standards issues, may be considered by the ADO in limited cases where extraordinary justification exists. The ADO must not program these types of projects unless the project has received pre-approval by APP-500. APP-500 provides the current pre-approval process for each fiscal year in an internal Regional Guidance Implementation Memo.

3-11. The Use of Critical Aircraft for Justification.

For some projects, the ADO must determine if a project is justified based on the applicable critical aircraft for the project. More than one critical aircraft may control the design of any specific airport's different facility features, such as runway length, strength of paved areas or lateral separations in airfield layout. The ADO must use the current version of Advisory Circular 150/5000-17, Critical Aircraft and Regular Use Determination, to determine the critical aircraft for specific projects and airport types. For funding purposes, it is APP-500 policy that the annual operations requirement for critical aircraft must not include military or federally-owned aircraft.

The ADO has the option to determine that a project is justified based on existing activity at the airport or activity that is projected to be at the airport within the next five years. The ADO has the option to require the sponsor to submit letters of support from airport users if the justification is based on projected activity. The letter must describe the airport user's plans or anticipated activity by the most demanding airplane, or critical aircraft.

3-12. Useful Life Test for Equipment and Facilities.

The useful life of the facility or equipment being rehabilitated, reconstructed or replaced must have been met in order for the project to be funded. The exception is when the ADO has determined that the rehabilitation, reconstruction, or replacement is necessary for safety reasons. Table 3-7 provides a list of minimum useful lives.

Although the minimum useful life of facility, equipment or vehicles may have been met, this does *not* automatically mean that the rehabilitation, reconstruction or replacement of the item is needed. Simply meeting the minimum useful life does not justify replacing the item if the facility, equipment, or vehicle is performing as intended.

Table 3-7 Minimum Useful Life

Project Type	Useful Life
a. All construction projects (unless listed separately below)	20 years
b. All equipment and vehicles (unless listed separately below)	10 years
c. Pavement rehabilitation (not reconstruction, which is 20 years)	10 years
d. Asphalt seal coat, slurry seal, and joint sealing	3 years
e. Concrete joint replacement	7 years
f. Airfield lighting and signage	10 years
g. ARFF vehicles	15 years
h. ARFF structural gear (firefighting suits), which has less heat insulation than proximity gear (per the National Fire Protection Association 1971 Standard on Protective Ensembles for Structural Firefighting and Proximity Firefighting)	7 years
i. ARFF proximity gear (firefighting suits), which is also referred to as slicks, bunker, or turn out gear (per the National Fire Protection Association 1971 Standard on Protective Ensembles for Structural Firefighting and Proximity Firefighting)	5 years
j. NAVAIDs and Weather Reporting Equipment	15 years
k. Buildings	40 years
l. Land	Unlimited
m. Loading Bridges	20 years
n. Fencing	20 years

3-13. Benefit-Cost Analysis (BCA) for NAVAIDs and Weather Reporting Equipment.

If a BCA is required for a NAVAID or weather reporting equipment, this requirement is listed in the appendices for that specific project. The ADO must contact APP-500 for the latest tools and procedures for this process.

3-14. BCAs for Capacity Projects Using Discretionary Funds.

A BCA is a tool to determine if a project's benefits outweigh its costs. If the ADO is considering funding a capacity project with AIP discretionary funding, 49 USC § 47115(d) requires that the FAA review a BCA. It is FAA policy that, as of October 28, 2011, a BCA is only required if the sponsor is requesting more than $10 million in discretionary funding over the life of the project.

This is a key change to the detailed BCA preparation guidance contained in the document titled FAA Airport Benefit-Cost Analysis Guidance (see Appendix B for link). A few of the more important highlights from this document are included below.

a. Capacity Project Definition. This definition is included in Appendix A. Except for the two types of projects listed in Table 3-8, it is FAA policy that the ADO must obtain a joint APP-400 and APP-510 concurrence on whether the project is considered capacity and therefore requires a BCA.

Table 3-8 Projects Where the FAA Has Determined if a BCA is Required

For the following project…	A BCA is…
a. Construct a new airport that is not replacing an existing airport of any type or obligation status.	**Required.** By definition, the airport will create capacity where none currently exists.
b. Rehabilitate/reconstruct eligible airfield infrastructure with no increase to the original functionality.	**Typically Not Required, although the FAA may require a BCA.** Although the FAA Airport Benefit-Cost Analysis Guidance (see Appendix B for link) requires that the FAA make this determination on a case by case basis, the FAA has determined that these projects are cost beneficial and typically do not require a separate BCA.

b. Associated Work. When preparing the BCA, the sponsor must include all of the development items directly associated with the capacity project in the BCA. The sponsor cannot pull out pieces of the associated work, even if the sponsor believes the associated work is not capacity related, without the express approval of the FAA.

c. Estimates of Future AIP Funding. Since the BCA must occur before the project is planned in detail, the financial analysis may be incomplete, or not detailed enough to identify all the funding sources for the project. A sponsor may be uncertain about its future entitlement funds and is unable to predict accurately the discretionary funds needed to fund the project. In cases like these, the sponsor and the FAA must jointly agree on a reasonable amount of discretionary funding, given the best information available at the time.

d. BCA Process. The BCA process, per FAA policy, is outlined in Table 3-9.

Table 3-9 BCA Process

The BCA process steps include…
a. ADO Notification to Regional Office and APP-500. ADOs must notify the regional office and APP-500 promptly when the ADO determines that a sponsor will be submitting a BCA in the near future. Preliminary information provided to APP-500 must include a general description of the project, the estimated cost, and the project's justification.
b. APP-500 Guidance to Regional Office and ADO. Based on the project, APP-500 will indicate whether a BCA is required and provide the ADO and regional office with the appropriate review method, internal coordination, appropriate samples, and other necessary information.
c. Sponsor Preparation of BCA. Sponsors must use FAA Airport Benefit-Cost Analysis Guidance (see Appendix B for link) when preparing a BCA for a capacity project.
d. Sponsor Submittal. Sponsors must submit one hard copy and one electronic copy of the BCA to the ADO. Sponsor must submit BCAs far enough in advance of any requested grants or LOI offers in order to avoid potential delays in funding decisions.
e. FAA Determination. In most cases, APP-500 will prepare the official FAA determination, which may include internal coordination with other FAA offices, and forward a copy of the official determination to the ADO and regional office.
f. ADO Notification to Sponsor. The ADO will send the official FAA determination to the sponsor and will place a copy in the grant file.

3-15. BCAs for All Other Projects.

The FAA also reserves the option to require a BCA for any AIP funded project, regardless of project type, funding type, or funding amount.

Section 4. Project on Airport Property (with Good Title).

3-16. On-Airport Property Requirements.

As a general rule, projects must be located on airport property (to which the sponsor holds good title). Per FAA policy, off-airport projects are limited to those listed in Table 3-10. As discussed in Table 2-9, leasing from a private entity does not meet the requirements for good title.

Table 3-10 Eligible Off-Airport Projects

Eligible off-airport projects are limited to…	And the sponsor, at a minimum, must have…
a. Removal of obstructions.	**An easement or verification of adequate land use controls (such as ordinances or zoning) that would prohibit the obstruction from reoccurring.** Easements must be shown on the Exhibit A (property inventory map). The reason the ADO must not issue a grant to remove the obstruction without an easement or land use control is because the obstruction removal needs to be a permanent solution.
b. Marking or lighting obstructions.	**An easement or a written agreement.** If the sponsor executes an easement, the easement must be shown on the Exhibit A (property inventory map). If the sponsor wants to use a written agreement, the ADO has the option to contact APP-400 to ensure that the written agreement is adequate. The agreement must also transfer the responsibility of maintaining the development to the property owner once the project is complete.
c. Outfall drainage ditches.	**An easement.** The easement must be shown on the Exhibit A (property inventory map).
d. Relocation of roads and utilities constituting airport obstructions or to allow eligible airport development.	**A written agreement.** The sponsor must have a formal written agreement with the property owner that allows the work to be done. The agreement must also transfer the responsibility of maintaining the development to the property owner once the project is complete.
e. Installation or relocation of NAVAIDs.	**An easement.** The easement must be shown on the Exhibit A (property inventory map).
f. Construction or installation of eligible utilities.	**An easement.** The easement must be shown on the Exhibit A (property inventory map).
g. Airport waste-water treatment plants.	**An easement.** The easement must be shown on the Exhibit A (property inventory map).
h. Noise soundproofing projects.	**A written agreement.** The sponsor must have a formal written agreement with the property owner that allows the work to be done. The agreement must also transfer the responsibility of maintaining the development to the property owner once the project is complete.
i. Noise implementation projects requiring placement of sponsor owned equipment (such as installation of noise monitors).	**An easement.** The easement must be shown on the Exhibit A (property inventory map).

Table 3-10 Eligible Off-Airport Projects

Eligible off-airport projects are limited to…	And the sponsor, at a minimum, must have…
j. Environmental mitigation measures required as a condition of environmental approval for property improvements (such as wetlands replacement).	**A written agreement** The sponsor must have a formal written agreement with the property owner that allows the work to be done. The agreement must also transfer the responsibility of maintaining the development to the property owner once the project is complete.
k. Environmental mitigation measures required as a condition of environmental approval for placement of sponsor owned equipment (such as installation of noise monitors).	**An easement.** The easement must be shown on the Exhibit A (property inventory map).
l. Regional Aircraft Rescue and Firefighting Training Facility	**A written agreement.** The sponsor must have a formal written agreement with the property owner that allows the work to be done. The agreement must also outline who is responsible for maintaining the project when it has been completed.

Section 5. Project on Airport Layout Plan.

3-17. Airport Layout Plan Requirement.

49 USC § 47107(a)(16) requires that the sponsor must maintain a current airport layout plan (ALP). It also prohibits the sponsor from altering the airport unless the ADO has determined that the project will not adversely affect the safety, utility, and efficiency of the airport.

Per FAA policy, the ADO must not program a project that needs to be added to an FAA approved ALP until the sponsor submits a revised ALP and it receives FAA approval.

Therefore, for projects not shown on the approved ALP that are expected to have a significant impact on aeronautical or airport operations, the ADO must advise the sponsor to complete an ALP Update for FAA review and approval.

For projects not shown on the approved ALP that are not expected to have a significant impact on aeronautical or airport operations, the ADO may allow the sponsor to revise their ALP by submitting an aeronautical study. If the aeronautical study does not result in an objection from the FAA, the ADO may accept the ALP revision by issuing a letter to the sponsor that includes a reference of the aeronautical study determination number in the approval letter. If the aeronautical study results in an objection from the FAA, then the sponsor must revise the scope of the project as necessary to address the objection, and submit another aeronautical study. The ADO must not program the grant until an acceptable aeronautical study is complete. In addition,

the ADO must then require the sponsor to submit a revised ALP as a condition of closing the grant.

In limited cases where directed by APP-500, the ADO may program the project without the above ALP or aeronautical study approval; however the ADO must complete the required determination prior to issuing the grant per 49 USC § 47107(a)(16)(C).

The methods presented under this section do not preclude or satisfy the sponsor's requirement to conduct an environmental review of the project.

Section 6. Intergovernmental Review and Airport User Consultation Complete.

3-18. Intergovernmental Review.

The current version of FAA Order 1200.21, Intergovernmental Review of FAA Programs and Activities contain intergovernmental review requirements for AIP projects. This satisfies the requirement in 49 USC § 47106(a)(1) that the project be consistent with plans (existing at the time the ADO issues the grant offer) of public agencies around the airport.

Sponsors are required to coordinate projects through the appropriate state contact for projects listed in Table 3-11. The state contact information is available on the Intergovernmental Review page of the Office of Management and Budget (OMB) website (see Appendix B for link). Table 3-12 contains key requirements.

Table 3-11 Projects Requiring Intergovernmental Review

The sponsor must coordinate projects through the appropriate state contact for…
a. Projects that significantly affect state or local governments beyond airport boundaries.
b. Projects specifically requested under a state's review process.
c. Projects at a medium or large hub airport that involve the siting of the airport location, a new runway or a major runway extension. In this case, 49 USC § 47106(c)(1)(A) requires that the sponsor must also provide airport layout plan amendments (and an associated master plan) upon request by the relevant Metropolitan Planning Organization (MPO).

Table 3-12 Key Requirements for Intergovernmental Review

Some of the key requirements are…
a. Sponsor Notification. The regional office is responsible for informing new sponsors of the required intergovernmental project review process per the current version of FAA Order 1200.21, Intergovernmental Review of FAA Programs and Activities, however the regional office may delegate this to the ADO. The ADO must also notify all affected sponsors when a Federal change is made to the review process.
b. Review Timeline. It normally takes state and local agencies 60 days to complete their review. The sponsor must not submit a grant application before this coordination is complete. The ADO must not issue a grant before the 60 day review period is over.
c. Early Project Review. If an interagency review was completed in the environmental or planning stage of the project, it normally will not need to be repeated during the implementation stage unless the scope of work has changed, substantial new information has become available, or significant time has passed.
d. Process Changes. The ADO must forward formal changes in a state's intergovernmental project review process to the Department of Transportation (DOT) Assistant Secretary for Administration. All affected DOT offices must implement the process changes submitted by the state within 90 days of receipt from the state.
e. Establishment of State Process. States, in consultation with local elected officials, have the option to establish their own process for reviewing and commenting on Federal programs and activities.
f. Treatment of Comments. The ADO has the option to accept the comments, reach a mutually agreeable solution with the state or local agency, or reject the comments. While the ADO is not required to accept comments or discuss another solution, the ADO has the option to provide a written explanation of the final decision as a courtesy to the single point of contact at the state (preferably at least 15 days before the project begins). If no single point of contact for the state exists, the ADO has the option to send the written explanation to the parties that initially provided comments. When 49 USC § 47106(c)(1)(A) is triggered, the ADO must send the MPO a written explanation of the final decision. When the ADO provides a written explanation of the final decision to a state or MPO, the ADO must also send an informational copy to the DOT Assistant Secretary for Administration.

3-19. Consultation with Airport Users.

Per 49 USC § 47105(a)(2), a sponsor must consult with the airport users that will be affected by the project. The consultation process does not require users to provide input or agree with the proposal. Other consultation requirements are included in Table 3-13.

Table 3-13 Airport User Consultation Requirements

Requirements per FAA policy include…	
a.	The affected parties must be given a reasonable opportunity to provide input to proposals for airport development.
b.	The consultation must take place prior to submittal of the grant application. Since consultation is part of planning project, separate pre-grant consultation is not required.
c.	The consultation must include all project considerations that bear on the decision to proceed and which impact users' charges or operations.
d.	At a minimum, the consultation must cover the general nature of the development proposed, its estimated cost, and its estimated start and stop dates.

Section 7. FAA Environmental Finding Complete.

3-20. Environmental Finding Requirements.

Per 49 USC § 47106(c), any airport project funded with AIP funds requires an environmental finding (Categorical Exclusion, Finding of No Significant Impact, or Record of Decision) prior to initial grant programming. The requirements for environmental analysis and findings are included in the current version of FAA Order 5050.4, National Environmental Policy Act (NEPA) Implementing Instructions for Airport Projects.

Per FAA policy, the ADO must not program a project until the environmental finding is complete.

Section 8. Usable Unit of Work Obtained.

3-21. Usable Unit Requirements (and Phased Project Conditions).

AIP grants that are given must result in a complete project. Partial construction or incomplete acquisition does not result in a complete project and therefore is not a usable unit of work. The required usable unit of work by project type is included in the project requirement appendices for that project.

There is one exception to this, and it is often referred to as a phased project. The FAA may issue a grant for a portion of a project when conditions in Table 3-14 are met.

Examples of acceptable and unacceptable grant descriptions are listed in Table 3-15.

Table 3-14 Requirements for Grants that will Not Result in a Usable Unit of Work

The project must meet all of the following requirements…
a. The ADO must include a special condition in the grant that requires the sponsor to complete a safe, useful, and usable unit of development that is, per 49 CFR 47106(a)(4), completed in a reasonable timeframe.
a. The grant description must clearly define the specific portion of the work being done in the grant, not the work that will be completed in all of the phases. The ADO can accomplish this by referencing the dimensions of the work or the specific contracts being funded.
b. Where the grant is for reimbursement of work, the requirements that the grant describe the work specifically in each phase must be met.

Table 3-15 Examples of Acceptable and Unacceptable Grant Descriptions

The description is…	For the following grant description for a multi-phase terminal building project…
a. Unacceptable.	Construct Terminal (Phase 1 – Building) Construct Terminal (Phase 2 – Building) Construct Terminal (Phase 3 – Building) Construct Terminal (Phase 4 – Building) Construct Terminal (Phase 5 – Building) Construct Terminal (Phase 6 – Building)
b. Acceptable.	Construct Terminal (Phase 1 – Site work) Construct Terminal (Phase 2 – Building- Foundation) Construct Terminal (Phase 3 – Building –Structure) Construct Terminal (Phase 4 – Building –Electrical, HVAC, Plumbing) Construct Terminal (Phase 5 – Building – Finishes, Interior and Exterior) Construct Terminal (Phase 6 – Building) – Passenger Boarding Bridges)

Section 9. FAA Standards Met.

3-22. Mandatory FAA Standards.

a. General Requirement. Per 49 USC § 47105(b)(3), a project must be planned, designed and constructed in accordance with current FAA standards unless the FAA has approved a

modification to the standard for the specific project. Mandatory FAA standards include airport design, construction, and equipment standards and specifications.

b. Safe Approaches for Runway Projects (Clear Approaches). The FAA has interpreted 49 USC § 47105(b)(3) to mean that safe approaches are part of the FAA standards that must be met for runway projects. Per FAA policy, the ADO must not fund the rehabilitation, construction, or extension of any section of a runway that the ADO has determined will not be usable due to unsafe approaches using the latest version of Advisory Circular 150/5300-13, Airport Design.

c. List of Advisory Circulars. The FAA standards consist of the current version of the advisory circulars listed in the document titled Current FAA Advisory Circulars Required for Use in AIP Funded and PFC Approved Projects. This list (see Appendix B for link), is published to comply with Airport Sponsors Assurance 34, regulations, published guidance, and FAA policy.

d. Timing of Advisory Circulars. If an FAA standard changes while a project is in progress, the sponsor must contact the ADO to determine whether the new standard must be met. Generally:

(1) If a project *has not* been bid, it is the sponsor's responsibility to ensure that the finished design meets the latest published standard, unless the ADO and the sponsor agree that the latest published standard does not have to be included.

(2) If the project *has* been bid, the ADO will not normally require the sponsor to meet the revised standard. The ADO has the option to require the sponsor to meet the revised standard when:

(a) The requirements can be easily incorporated.

(b) The ADO has determined that the old standard will negatively impact the airport.

(c) The ADO and sponsor mutually agree to include the new standard.

e. Other Standards. The ADO may incorporate other standards into a project as a special condition in the grant agreement. These standards then become mandatory by their inclusion in the grant. The automated AIP system contains the currently available special conditions.

3-23. Modification to FAA Standards (or Specifications).

Where the FAA has published specifications for specific items, it is FAA policy that sponsors must use the specifications as written, with no changes from the specifications, except where explicitly allowed in the specification.

The sponsor must obtain an FAA modification to standards approval for any change that is not specifically allowed, no matter how minor it may seem to the sponsor. This is necessary to ensure an acceptable level of safety, capacity, efficiency, utility or access. Additionally, the FAA review will ensure the proposed modification will not unduly limit competition, eliminate

FAA approved vendors, compromise statutory or regulatory requirements, or negatively impact the project.

For AIP funding purposes, some modifications to FAA standards (such as those examples in Table 3-16) will not be considered because they violate 2 CFR part 200 or deviate from FAA design standards. The ADO or AAS-100 must not approve such requests for AIP funded projects. However, in the event of a pre-existing nonstandard airfield configuration, AIP funds may only be used to rehabilitate or reconstruct the affected airfield element if FAA has formally approved a modification to standards or the airfield element is brought up to standards.

The current version of FAA Order 5300.1, Modifications to Agency Airport Design, Construction, and Equipment Standards contains the requirements for modification to standards.

Table 3-16 Examples of Modifications of Standards that Must Not be Considered for AIP Funded Projects

Examples include…	
a.	For cost saving only without regard to level of performance and safety as provided by FAA standards.
b.	Standardization of equipment type.
c.	Local preference.
d.	Airfield lighting circuits that are not 6.6 amperes per current FAA standards.

3-24. Standards that Exceed those of the FAA.

FAA policy is that if the project meets the FAA standards, then the public need has been fully met. Therefore, a project that is designed or built to a more rigorous standard is considered to exceed FAA standards. Except in limited circumstances for select projects as outlined in Table 3-17, the ADO must not fund work exceeding FAA standards with AIP.

The ADO also has the option of allowing the sponsor to pay for the cost to exceed the FAA standards if the procurement requirements in Paragraph 3-39 are met for inclusion of ineligible and/or non-AIP work in a contract. Funding examples are provided in Table 3-18.

Per FAA policy, sponsors must obtain written ADO concurrence prior to either to designing or bidding AIP funded projects that will include work that exceeds FAA standards. The ADO must put a copy of their determination in the grant file.

Per FAA policy, if the ADO allows the sponsor to pay for the added cost of a project or equipment, the sponsor is not allowed to use the bid process to determine the non-AIP costs.

Table 3-17 Limited Circumstances Where Work Exceeding FAA Standards May be Funded with AIP

The limited circumstances include…
a. **Meeting a Local Standard**. 49 USC § 47110(b)(1) gives the ADO the option to consider funding a cost if the cost is necessary to allow the project to proceed. Therefore, if there is added cost to meet a local permitting standard, the ADO has the option to consider funding the added cost.
b. **Rehabilitating an Airfield Facility (or Piece of Equipment).** The ADO has the option of funding a project to rehabilitate (not reconstruct) an airfield facility (or piece of equipment) that exceeds FAA standards if the project meets the following criteria. **(1)** The project component is normally an eligible cost. **(2)** The sponsor has demonstrated a continuing need for the existing facility or equipment. This can either be based on past aeronautical activity or use, or to accommodate the aircraft of a current tenant based at the airport. **(3)** The ADO has determined that the added cost is reasonable compared to the benefit being obtained. The ADO has the option to request a life cycle cost analysis, benefit-cost analysis, or other applicable analysis to support this determination. Sponsor guidance on life cycle cost analysis is discussed in Paragraph U-15 and sponsor guidance on benefit-cost analysis is contained in the document titled FAA Airport Benefit-Cost Analysis Guidance (see Appendix B for link).

Table 3-18 Funding Examples for Work Exceeding FAA Standards

If a sponsor requests…	If the requirements of Table 3-17 have been met, the ADO has the option to…
a. A project to construct a parallel taxiway at 400 feet from the runway when the FAA standard (based on the critical aircraft and approach minimums) is 300 feet based. The extra costs for normal site preparation and pavement construction (there are no large extra expenses). In this case, no cost analysis would be required because the FAA has already determined that the long term benefit of locating the taxiway far outweighs the potential cost of relocating the taxiway in the future. This applies regardless of whether the airport shows the need for the 400 feet within the 20 year planning period.	Fund the added cost with AIP.
b. A project for reconstruction of a runway to a width wider or length longer than required by the critical aircraft. Because the project is reconstruction, it is considered similar to construction of a new runway.	Allow the sponsor to pay for the added cost if the procurement requirements in Paragraph 3-39 are met for inclusion of ineligible and/or non-AIP work in a contract.

Table 3-18 Funding Examples for Work Exceeding FAA Standards

If a sponsor requests…	If the requirements of Table 3-17 have been met, the ADO has the option to…
c. A project for rehabilitation or overlay of a runway or taxiway to a width wider or length longer than required by the current critical aircraft.	Fund all or a portion of the added cost with AIP.
d. A project for construction of a 75 foot wide taxiway when the justified width is 50 feet. This project is designed for a critical aircraft that will not be met for five or more years.	Allow the sponsor to pay for the added cost if the procurement requirements in Paragraph 3-39 are met for inclusion of ineligible and/or non-AIP work in a contract.
e. A project for construction of a 75 foot wide taxiway when the justified width is 50 feet. This project is designed for a critical aircraft that the ADO has determined will be met within five years.	Fund the added cost with AIP.
f. An apron construction project that includes fire hydrant installation that is required to receive a building permit determined that the cost of the fire hydrant installation is necessary to allow the project to proceed.	Fund the added cost with AIP.
g. A project that has an extended warranty period of 36 months, and the FAA standard is 12 months.	Allow the sponsor to pay for the added cost if the procurement requirements in Paragraph 3-39 are met for inclusion of ineligible and/or non-AIP work in a contract.
h. A project to rehabilitate an ARFF building that includes a weight training room that requires the ventilation system in the building be replaced. The weight training room is not required by FAA standards. The ADO has determined the weight training room and the ventilation system are ineligible costs.	Allow the sponsor to pay for the added cost if the procurement requirements in Paragraph 3-39 are met for inclusion of ineligible and/or non-AIP work in a contract.
i. A project to rehabilitate an ARFF vehicle that is larger than required by 14 CFR part 139 index. The ADO has determined that rehabilitation of the larger ARFF vehicle is less expensive than acquiring a new vehicle that is correctly sized.	Fund the added cost with AIP.
j. A project to remove obstructions, including land acquisition, to meet the clearance requirements for an approach category that is greater than the aircraft category (for example clearing to C standards where the airport is designated as a B-II airport on its ALP for the entire planning period.)	Allow the sponsor to pay for the additional costs, including the costs of the land acquisition. AIP cannot be used for the additional land or clearing because the work is not necessary.

3-25. Eligibility Differences between the Handbook and the Advisory Circulars.

Advisory circulars are written to cover a broad range of airport design, construction, and equipment standards. There are recommendations in many advisory circulars that exceed what is justified under AIP. However, just because an item is discussed in an advisory circular, this does not make it eligible or justified. This Handbook, not the advisory circular, provides the guidance for determining eligibility and justification for any project that is AIP funded.

3-26. Approval and Use of State Standards.

Per 49 USC § 47105(c), a sponsor may request to use state standards for nonprimary airport development that are different from FAA standards. Per 49 USC § 47114(d)(5), a sponsor may also request to use state highway construction and material specifications for full strength airfield pavement construction at a nonprimary airport. The requirements for these two uses of state standards are different, and are discussed in detail in the current version of Advisory Circular 150/5100-13, Development of State Standards for Nonprimary Airports.

In order for the ADO issue grants using any type of state standards on a project in the grant, the requirements in Table 3-19 must be met.

Table 3-19 Requirements for the Use of State Standards

In order for an ADO to permit the use of state standards on an AIP funded project, the following requirements must be met…
a. Modification to Standard Approved. AAS-1 must have approved the modification to standards according to the current version of FAA Order 5300.1, Modifications to Agency Airport Design Construction and Equipment Standards prior to the ADO issuing the grant. The ADO must put a copy of the written determination (or a reference to the location of the electronic determination) in the grant file.
b. Advisory Circular Requirements Met. The sponsor's request for use of the modification to standards must comply with all requirements contained in the current version of Advisory Circular 150/5100-13, Development of State Standards for Nonprimary Airports.
c. Additional Restriction #1 for Airfield Pavement Built Using State Highway Specifications Met. Per 49 USC § 47114(d)(5)(A), the runway cannot currently be greater than 5,000 feet or currently be serving aircraft that are greater than 60,000 pounds gross weight. **(1)** For those airports where all runways meet the 5,000 feet or less criteria, the sponsor may consider the use of state highway standards for all eligible airfield pavement. **(2)** For those airports with multiple runways, some of which exceed the 5,000-runway length limitation, the sponsor may only consider the use of state highway standards for airfield pavement exclusively serving a runway with a length of 5,000 feet or less and for apron and taxilanes that only serve aircraft less than 60,000 pounds gross weight.
d. Additional Restriction #2 for Airfield Pavement Built Using State Highway Specifications Met. Per 49 USC § 47114(d)(5)(A), the life of the pavement must not be less than the life of the pavement built using FAA standards. However, for funding purposes, AIP can only be used to fund to the life required by the FAA standards, which is 20 years.

Table 3-19 Requirements for the Use of State Standards

In order for an ADO to permit the use of state standards on an AIP funded project, the following requirements must be met…
e. Additional Restriction #3 for Airfield Pavement Built Using State Highway Specifications Met. Per 49 USC § 47114(d)(5)(B), the ADO must not issue another AIP grant to rehabilitate or reconstruct the airfield pavement for a period of 10 years after the pavement construction is completed. The only exception to this requirement is if AAS-1 has determined rehabilitation or reconstruction is required for safety reasons.
f. Additional Restriction #4 for Airfield Pavement Built Using State Highway Specifications Met. Because 49 USC § 47114(d)(5)(A) limits the runway length and aircraft weight, the airport layout plan must not show a future extension (in the 20 year planning period) that will result in a runway greater than 5,000 feet or serve aircraft that are greater than 60,000 pounds gross weight.

3-27. Projects with No FAA Standard.

Some eligible projects have no corresponding FAA standards, procedures, policy, plans, and/or specification.

The ADO must contact APP-520 for assistance on project eligibility and AAS-100/300 to obtain the FAA standards and requirements for the project. Until the FAA standard is published, APP-520 will provide eligibility of these projects and AAS-100/300 will provide the standards to which the project must be constructed on a case-by-case basis.

In some cases, the FAA has specifically adopted the standards of another Federal agency or of an industry group. The ADO can obtain a current list of these adopted standards from AAS-100/300 and APP-520.

3-28. ADO Review of Plans and Specifications.

Sponsors must prepare plans and specifications to meet FAA standards as discussed in this section of the Handbook. In addition, sponsors are required to prepare an engineer's report that contains the information in Table 3-20. The ADO must follow the FAA policy for reviewing plans and specifications outlined in the latest version of the Implementation Plan for FAA Review of Construction Plans and Specifications for AIP Funded Projects memorandum issued by AAS-1.

If the ADO reviews the plans and specifications and engineer's report, the ADO is not required to issue an approval. Instead, the ADO has the option to provide comments to the sponsor. In reviewing the plans and specifications and engineer's report, the ADO also has the option to request input from affected FAA lines of business. If the ADO provides a written response, the ADO must file a copy of the response (or a reference to the location of the electronic determination) in the grant file. The ADO must not fund any project the ADO has determined does not meet FAA standards.

The FAA's review of a sponsor's plans or specifications is for the benefit of the FAA. This review is not intended to relieve the sponsor of their responsibility to fully comply with AIP requirements and does not represent approval of the plans or specifications.

In addition, sponsor certification of plans and specifications does not relieve the sponsor of the requirement to obtain prior FAA approval for modifications to standards or to notify the ADO of any limitations to competition within the project.

Table 3-20 Required Content for Engineer's Reports

Engineer's reports must include…
a. Design Computations. The report must include a summary of the design computations used in the design of major development items. The sponsor is required to include pavement design information by either submitting FAA Form 5100-1, Airport Pavement Design or by submitting the first page of this form with the FAARFIELD design results. A summary of computations and a description of the method used to conduct the drainage design must be presented. Earthwork cross-sections and mathematical calculations for designs are not required to be included in the design report unless requested by the ADO.
b. Selections of Design Materials and Equipment and Proposed Modifications to Standards. The engineer's choices and recommended modifications will, in most cases, be influenced by service records for comparable construction and by cost comparisons. The report must include concise statements and cost comparisons that justify selections made and the proposed modifications to standards proposed in the project. The current version of FAA Order 5300.1, Approval Level for Modification of Agency Airport Design and Construction Standards, provides additional information on modifications to design and construction standards.
c. Sole-Source, Proprietary, or other Competition-Limiting Specifications or Design Elements. The report must list all such items, including the reason for the limitation, impacts of limiting competition, and the benefits to the Federal government for the proposal.
d. Other Elements. The report must outline related project work elements to be done without AIP assistance, including details on how the work is to be accomplished, and how it relates to the AIP work. Work to be done by utility companies must be described in sufficient detail to verify adequate funding for the work.
e. Support Data. The report must also include supporting data and itemized project cost estimates with source information. Any unique circumstances that may influence adjustments of existing project cost estimates must be explained.

Section 10. Project Procured Correctly.

3-29. Importance of 2 CFR §§ 200.317-200.326 (Formerly 49 CFR § 18.36).

Sponsors must follow 2 CFR §§ 200.317-200.326 when making procurements under an AIP grant. This regulation contains the policies and procedures for AIP project actions such as construction, equipment purchases, and selection for professional services. If a sponsor fails to

meet any of the procurement requirements for their AIP funded project, it may result in the ADO determining a normally allowable cost to be unallowable.

3-30. Sponsor Procurement Requirements.

The sponsor, not the ADO, is responsible for meeting all procurement requirements. The sponsor establishes, enforces, and administers the contract agreements and is responsible for all contractual matters, including evaluation and award of contract, resolution of claims and disputes, and settlement of litigation issues. The ADO is not a party to the contracts that a sponsor executes under an AIP grant.

Per 2 CFR § 200.318(k), the ADO cannot substitute their judgment for the sponsor unless the matter is primarily a Federal concern. However, the ADO still has a defined role in procurement oversight per 2 CFR §§ 200.317-200.326 as further defined in this chapter.

Sponsor procurement requirements are discussed in more detail in Appendix U.

3-31. Summary Table of Mandatory/Optional ADO Procurement Review.

There are only certain situations where the ADO is required by 2 CFR §§ 200.317-200.326 to review the sponsor's procurement process. Otherwise, 2 CFR § 200.324(c)(2) allows the ADO to accept sponsor certification that the sponsor is following 2 CFR §§ 200.317-200.326. This certification is included in the grant assurances signed by the sponsor and therefore, no additional action is required by the ADO.

There are also certain situations where FAA policy or legislation requires the ADO to review the sponsor's procurement process. Table 3-21 contains a summary of the mandatory and optional ADO procurement review responsibilities. The ADO always has the option of reviewing any sponsor procurement documents and systems at any time during the grant process.

Table 3-21 Summary Table of Mandatory/Optional ADO Procurement Review

For the following situation…	ADO review is…	The associated 2 CFR §§ 200.317-200.326 general reference is…	And the requirements are in Paragraph…
a. Bid Protests and Appeals.	Mandatory (but limited in nature)	2 CFR § 200.318(k)	3-32
b. Procurement Protests and Appeals after the Contract Award.	Mandatory (but limited in nature)	2 CFR § 200.318(k)	3-33
c. Bonding that Does Not Meet the Minimum Requirements.	Mandatory (or can rely on sponsor's written assurance)	2 CFR § 200.325	3-34

Table 3-21 Summary Table of Mandatory/Optional ADO Procurement Review

For the following situation…	ADO review is…	The associated 2 CFR §§ 200.317-200.326 general reference is…	And the requirements are in Paragraph…
d. Noncompetitive Proposals (Including Sole Source and Inadequate Number of Qualified Sources).	Mandatory	2 CFR § 200.320(f)	3-35
e. Limited Noncompetitive Proposal Situations (ALCMS Modifications, One Manufacturer, Sponsor Preferred, Prohibited LED Lighting).	Mandatory (for prohibited LED Lighting the notification review is mandatory and review of the procurement documents is optional)	2 CFR § 200.320(f) (N/A for prohibited LED lighting)	3-36
f. Change Orders, Supplemental Agreements, and Contract Modifications.	Mandatory (but not required until the ADO is issuing an amendment or closing the grant)	2 CFR § 200.320(f)	3-37
g. Contract Clauses and Contract Provisions Required for AIP Grants.	Optional (ADO responsibility is limited to notifying new sponsors of requirements)	2 CFR § 200.326	3-38
h. Contracts Containing Ineligible and/or Non-AIP Funded Work.	Mandatory	N/A	3-39
i. Contracts Containing Requirements that May Reduce the Number of Potential Bidders.	Mandatory	2 CFR § 200.319	3-40
j. Contracts Containing Work that Exceeds FAA Standards.	Mandatory	N/A	3-41
k. Consultant Contracts (Qualifications Based with Negotiated Price).	Optional with Sponsor Certification (unless sponsor deviates from requirements, then mandatory)	2 CFR § 200.320(d)	3-42
l. Design-Build and Construction Manager-at-Risk Contracts.	Mandatory	2 CFR § 200.320(d)	3-43

Table 3-21 Summary Table of Mandatory/Optional ADO Procurement Review

For the following situation…	ADO review is…	The associated 2 CFR §§ 200.317-200.326 general reference is…	And the requirements are in Paragraph…
m. Engineering Materials Arrestor System (EMAS).	Mandatory	2 CFR § 200.320(d)	3-44
n. Bid Alternates (Including Life Cycle Cost Analysis Alternates) and Bid Additives.	Optional with Sponsor Certification	2 CFR § 200.320(c)	3-45
o. Bidding Asphalt and Concrete Alternates.	Optional with Sponsor Certification	2 CFR § 200.320(c)	3-46
p. Buy American Requirements	Mandatory (if a waiver is required)	N/A	3-47
q. DOT Office of Inspector General (OIG) Notification of Potential Procurement/Bid Improprieties.	Mandatory	N/A	3-48
r. Escalator Clauses	Mandatory	N/A	3-49
s. Plans and Specifications Review.	As required in "Plans and Specifications Review Implementation Memorandum" published by FAA Office of Airport Safety and Standards.	2 CFR § 200.324(a)	3-50
t. Pre-award Review of Contracts.	Optional with Sponsor Certification	2 CFR § 200.324(b)	3-51
u. Sponsor's Procurement System.	Optional with Sponsor Certification	2 CFR § 200.324(c)	3-52
v. Force Account Work.	Mandatory	N/A	3-53
w. Value Engineering.	Mandatory	2 CFR § 200.318(g)	3-54
x. Indefinite Delivery (Task Orders) Extensions for *Construction* Services.	Mandatory	N/A	3-55

Table 3-21 Summary Table of Mandatory/Optional ADO Procurement Review

For the following situation…	ADO review is…	The associated 2 CFR §§ 200.317-200.326 general reference is…	And the requirements are in Paragraph…
y. Indefinite Delivery (Task Orders) Extensions for *Consultant* Services..	Mandatory	N/A	3-56
z. Suspension or Debarment of Persons or Companies.	Optional with Sponsor Certification (mandatory if a problem is identified)	2 CFR part 180 and 2 CFR part 1200	3-57

3-32. Bid Protests and Appeals.

The sponsor requirements for bid protests and appeals is contained in 2 CFR § 200.318(k) (see Paragraph U-10). Table 3-22 contains the ADO specific review requirements. Many bid protests result from a sponsor's improper modification of project specifications or solicitation package to include a sponsor's preference. In those situations, the ADO must not rely on the sponsor to resolve the protest, but must treat the protest as a Federal concern. Table 3-23 contains additional requirements for bid protests that are a Federal concern.

Table 3-22 ADO Review Requirements for Bid Protest and Appeals

The following applies…
a. Protest Sent Directly to the FAA by the Protester. If a protest is sent directly to the FAA, the FAA must send a copy of the protest to the sponsor per FAA policy. The ADO must notify the protester that the protest has been forwarded to the sponsor and they must deal directly with the sponsor. In addition, the ADO must request the sponsor to send a copy of the sponsor's protest procedures to the ADO. Per 2 CFR § 200.318(k), the sponsor is responsible for handling bid complaints and protests. The ADO's review responsibility at this point is limited to a cursory review of the protest to determine if there is a Federal concern and establishing that the sponsor has protest procedures in place. If there is a Federal concern, the ADO must notify the sponsor and request the sponsor immediately send a copy of the sponsor's proposed resolution. The ADO must not issue AIP funding until the ADO is satisfied the sponsor resolved the issue and correctly addressed any Federal concerns.
b. Copies of Protests Sent to the ADO by the Sponsor. After the sponsor's mandatory and timely submittal of the bid protests *and a copy of the sponsor protest procedures* to the ADO, the ADO's review responsibility at this point is limited to scanning the protest to determine if there is a Federal concern and establishing that the sponsor has protest procedures in place.

Table 3-22 ADO Review Requirements for Bid Protest and Appeals

The following applies…
c. Protests that are a Federal Concern. 2 CFR § 200.318(k) cautions that the Federal agencies (the ADO) not substitute their judgment for that of the sponsor unless the matter is a Federal concern. If there is a Federal concern, the ADO must notify the sponsor and request a resolution. The ADO must not issue AIP funding until the ADO is convinced the sponsor resolved the issue and correctly addressed any Federal concerns.
d. Cancelation of Prior Approval or Sponsor Certification. The receipt of the bid protest automatically cancels the ADO approval of the plans and specification or acceptance of the sponsor's certification.
e. Restrictions on AIP Funding Pending Resolution. The ADO must not issue AIP funding until the ADO has received the sponsor's written notification of how the issue was resolved and the ADO is satisfied the sponsor resolved the issue and correctly addressed any Federal concerns. By issuing the associated grant, the ADO is documenting their determination that the bid protest has been resolved.
f. Protester Appeals. Per FAA policy, a protester may pursue a protest with the Federal agency after exhausting all administrative remedies with the sponsor. Before taking any action, the ADO must have conducted a cursory review of the protest to determine if there is a Federal concern and established whether the sponsor has protest procedures in place. The ADO has the option to respond to the protester, but is not required to by 2 CFR §§ 200.317-200.326.

Table 3-23 Additional Actions for Bid Protests that are a Federal Concern

The following applies…
a. Determining a Federal Concern. Federal concerns include violation of Federal law or regulations. It includes allegations that the project plans or specifications have been altered to give preference to a manufacturer, to exclude a product, or otherwise limit competition. This is because limiting competition may violate 2 CFR § 200.319. Modification of specifications without receiving an FAA Modification of Standards is also a Federal concern.
b. Copies of Redlined Specifications and Solicitation Package Sent to the ADO by the Sponsor. The sponsor must send the ADO a copy of the as-bid specifications and the complete solicitation package, detailing where changes to the FAA standard specification have been made and which aspects of the solicitation are being protested.
c. Protests that Must Be Forwarded. If the bid protest involves another FAA line of business, such as the FAA Office of Civil Rights, the ADO must forward all documentation regarding the protest to the affected office. The ADO must notify the sponsor of the transfer and must advise the sponsor that the ADO will not issue AIP funding until the issue is resolved.

Table 3-23 Additional Actions for Bid Protests that are a Federal Concern

The following applies…
d. Cancelation or Rebidding a Project. If the ADO determines that the protest was a result of improper modification of the specifications or an otherwise defective solicitation package, the ADO must advise the sponsor that additional costs incurred fixing the package and soliciting the project are not eligible for reimbursement.
e. Documenting ADO Actions. Where the bid protest is a Federal concern, the ADO must document steps in the grant file that the ADO takes to ensure that the sponsor properly resolves the protest.

3-33. Procurement Protests and Appeals after the Contract Award.

The ADO review requirements for protest and appeals that occur after the contract is awarded is the same as the requirements for bid protests and appeals in Paragraph 3-32. However, since the project may already be under grant, the ADO must notify the sponsor that the sponsor must not request payments for the disputed costs.

3-34. Bonding that Does Not Meet the Minimum Requirements.

The sponsor requirements for bonding are contained in 2 CFR § 200.325 (see Paragraph U-23). Table 3-24 contains the ADO specific review requirements for bonding that does not meet the minimum requirements in 2 CFR § 200.325.

Table 3-24 ADO Review Requirements for Bonding that Does Not Meet the Minimum Requirements

For…	The following applies…
a. Bonding that Does Not Meet the Minimum Requirements.	The ADO is allowed to rely on the sponsor's written assurance that the Federal interests are adequately protected under the proposed bonding method. As long as the ADO has not issued a written negative determination, it is implicitly implied that the ADO has issued a favorable determination for all future procurement actions using the proposed bonding method.
b. Combined Payment and Performance Bonds.	The ADO is allowed to rely on the sponsor's written assurance that the Federal interests are adequately protected under the combined payment and performance bonding proposal. As long as the ADO has not issued a written negative determination, it is implicitly implied that the ADO has issued a favorable determination for all future procurement actions using the proposed bonding method.

3-35. Noncompetitive Proposals (Including Sole Source and Inadequate Number of Qualified Sources).

Sponsors are only allowed to use a noncompetitive procurement process for the limited circumstances outlined in 2 CFR § 200.320(f) (see Paragraph U-18). Some special noncompetitive proposal situations and their associated requirements are included in Paragraph 3-36.

Per FAA policy, the ADO must not issue a grant that includes noncompetitive proposals unless the ADO has reviewed the proposal and concurs that the requirements of 2 CFR § 200.320(f) have been met (see Paragraph U-18). The exception is for change orders, supplemental agreements, and contract modifications, which are discussed in Paragraph 5-35.

Except as otherwise noted in this section, the ADO has the option to document their concurrence either by notifying the sponsor in writing (with a copy to the grant file) or issuing the grant.

3-36. Limited Noncompetitive Proposal Situations (ALCMS Modifications, One Manufacturer, Sponsor Preferred, Prohibited LED Lighting).

Some limited noncompetitive proposal situations and their associated requirements are included in Table 3-25. These requirements are in addition to those in Paragraph 3-35.

Table 3-25 Procurement Rules for Limited Noncompetitive Proposal Situations

For the following limited noncompetitive situation…	The following applies…
a. Airfield Lighting Control and Monitoring System (ALCMS) Modifications	**(1) Only for ALCMS Modifications.** The following requirements only apply to ALCMS modifications. Sponsors must competitively procure new ALCMS installations. **(2) Separation into a Noncompetitive Procurement.** There are very specific requirements to separate the procurement into a separate noncompetitive procurement. Theses sponsor procurement requirements are contained in Paragraph U-18. **(3) ADO Review of Sponsor Notification.** The ADO must review the sponsor notification to verify if all of the requirements in Paragraph U-18 have been met. It is not necessary for the ADO to acknowledge the sponsor's notification. **(4) Filing of Sponsor Notification.** The ADO must keep a copy of the sponsor's notification and any ADO acknowledgement in the grant file. **(5) Equipment and/or Installation Eligibility.** The eligibility for the purchase and/or installation of this equipment is contained in Paragraph 3-93.

Table 3-25 Procurement Rules for Limited Noncompetitive Proposal Situations

For the following limited noncompetitive situation…	The following applies…
b. Certified Airfield Lighting Equipment with Only One Manufacturer	**(1) Separation into a Noncompetitive Procurement.** There are very specific requirements to separate the procurement into a separate noncompetitive procurement. Theses sponsor procurement requirements are contained in Paragraph U-18. **(2) ADO Review of Sponsor Notification.** The ADO must review the sponsor notification to verify if all of the requirements in Paragraph U-18 have been met. It is not necessary for the ADO to acknowledge the sponsor's notification. **(3) Filing of Sponsor Notification.** The ADO must keep a copy of the sponsor's notification and any ADO acknowledgement in the grant file. **(4) Equipment and/or Installation Eligibility.** The eligibility for the purchase and/or installation of this equipment is contained in Paragraph 3-93.
c. Sponsor Preferred Airfield Lighting Equipment	**(1) Separation into a Noncompetitive Procurement.** There are very specific requirements to separate the procurement into a separate noncompetitive procurement. Theses sponsor procurement requirements are contained in Paragraph U-18 **(2) ADO Review of Sponsor Notification.** The ADO must review the sponsor notification to verify if all of the requirements in Paragraph U-18 have been met. It is not necessary for the ADO to acknowledge the sponsor's notification. **(3) Filing of Sponsor Notification.** The ADO must keep a copy of the sponsor's notification and any ADO acknowledgement in the grant file. **(4) Installation Eligibility.** The eligibility for the purchase and/or installation of this equipment is contained in Paragraph 3-93. **(5) Not Force Account.** The ADO must not consider this situation as equivalent to sponsor force account or donated materials. **(6) Cannot be Used for Sponsor's Share.** Sponsors are prohibited from using the costs of sponsor-preferred airfield lighting equipment as part of the sponsor's share of a grant. **(7) Limited to Airfield Lighting Equipment.** By FAA policy, the use of AIP for certain costs associated with the use of non-AIP funded sponsor furnished equipment is limited to a sponsor's preferred airfield lighting manufacturer's equipment.

Table 3-25 Procurement Rules for Limited Noncompetitive Proposal Situations

For the following limited noncompetitive situation…	The following applies…
d. Certified Airfield Light Emitting Diode (LED) Lighting Equipment that is Prohibited from AIP Funding	**(1) Prohibited Equipment**. The list of LED lighting that is prohibited from AIP funding is included in Paragraph C-2. **(2) ADO Review of Sponsor Notification.** The ADO must review the sponsor notification to verify separation of prohibited LED lighting procurement from AIP funded procurement per Paragraph U-7. It is not necessary for the ADO to acknowledge the sponsor's notification. **(3) Filing of Sponsor Notification.** The ADO must keep a copy of the sponsor's notification and any ADO acknowledgement in the grant file. **(4) ADO Review of Sponsor Procurement Documents.** The ADO has the option to review the sponsor's procurement documents on AIP funded projects to validate that the sponsor has separated AIP funded procurement and prohibited LED lighting procurement. **(5) Equipment and/or Installation Eligibility.** The eligibility for the purchase and/or installation of this equipment is contained in Paragraph 3-93.

3-37. Change Orders, Supplemental Agreements, and Contract Modifications.

The requirements for change orders, supplemental agreements, and contract modifications are contained in Paragraph 5-35.

3-38. Contract Clauses and Contract Provisions Required for AIP Grants.

The sponsor requirements for AIP required contract clauses and provisions are contained in Appendix II of 2 CFR part 200 (as referenced in 2 CFR § 200.326) as well as other regulations and statutes (see Paragraph U-24). The ADO responsibility is limited to making sure that new sponsors are aware of these requirements.

3-39. Contracts Containing Ineligible and/or Non-AIP Funded Work (Including Proration).

The sponsor requirements for contracts containing ineligible and/or non-AIP funded work (including how to determine the low bidder) are contained in Paragraph U-12. Table 3-26 contains the ADO specific review requirements.

Table 3-26 ADO Review Requirements for Contracts Containing Ineligible or Non-AIP Funded Work

For…	The following applies…
a. Contracts Containing Ineligible Work or Work not Funded with AIP	It is FAA policy that a sponsor must not combine ineligible work and/or non-AIP funded work within the same contract unless the sponsor provides a compelling reason documenting that it is in the Federal governments best interest to the ADO and the ADO has concurred with the sponsor's request in writing. Examples of situations that may be in the best interest of the Federal government are included in Table 3-27. The FAA does not consider the fact that including ineligible of non-AIP funded work is at *no additional cost to the Federal government* to be a benefit to the Federal government.
b. ADO Concurrence	In order to concur with the sponsor's request, the ADO must determine that including the work is in the best interest of the Federal government, and that this will not result in an increase to the cost of the AIP funded work and that the cost of ineligible and/or non-AIP funded work can be easily identified. This is because 2 CFR § 200.302(a) requires that the ADO know what was paid for under the grant. The ADO must put a copy of their determination in the grant file. If the field of potential bidders will be reduced by the inclusion of the ineligible or non-AIP funded work, this may reduce competition and affect the cost. Therefore, the ADO cannot conclusively determine that there will be no increase in cost. Paragraph 3-40 includes examples of where potential bidders may be reduced.
c. ADO Determination of Federal Participation	The ineligible and/or non-AIP funded work must be clearly separated from the AIP funded work. This is the preferred method for the ADO to determine Federal participation. If the ADO determines the ineligible and/or non-AIP funded cannot be feasibly separated from the AIP funded work, the ADO can prorate the work to determine Federal participation. **Example of Prorating:** A project will extend an off-airport drainage box culvert through the airport. This box culvert will also serve the neighborhood adjacent to the airport. The airfield runoff is 25 acres and the neighborhood runoff is 75 acres. The eligible Federal participation would be one fourth (25 acres divided by 100 acres) of the total cost to extend the culvert through the airport (including associated design, inspection, etc.).

Table 3-27 Examples of Being in the Federal Government's Best Interest

Examples include…
a. The inclusion of ineligible and or non-AIP work will result in an overall reduction in the amount of construction workers and vehicles on the airfield. This is of benefit to the FAA because it reduces the potential risk of runway incursions.
b. The inclusion of ineligible and or non-AIP work will result in the runway being closed for construction for a significantly shorter period of time. This is of benefit to the FAA because it maintains system capacity.
c. The inclusion of a significant amount of non-AIP pavement will reduce the overall unit cost of the pavement, thus reducing the AIP project costs.
d. The inclusion of the ineligible portion of a hydrant fueling system in an AIP funded apron project that includes hydrant fueling pits will allow a functioning fueling system to be completed.

3-40. Contracts Containing Requirements that May Reduce the Number of Potential Bidders.

Per 2 CFR § 200.319, sponsor solicitations of AIP funded projects must not unduly restrict competition. It is FAA policy that a sponsor must not include requirements that reduce the number of potential bidders unless the sponsor must provide a compelling reason to the ADO and the ADO has concurred with the sponsor's request in writing. Table 3-28 contains examples where the number of potential bidders may be reduced.

Table 3-28 Examples Where the Number of Potential Bidders May be Reduced

Examples include…
a. A project that has a warranty requirement to store spare parts in a manufacturer's warehouse within 15 miles of the airport that has been in operation for at least one year.
b. A project specifying highway compliant snow removal equipment.
c. An ARFF vehicle that is required to be equipped with specialized extraction equipment that is only available as standard equipment on one manufacturer's vehicles.
d. A requirement for equipment to support remote maintenance monitoring.

3-41. Contracts Containing Work that Exceeds FAA Standards.

It is FAA policy that a sponsor must not include work that exceeds FAA standards in a contract unless the sponsor provides a compelling reason to the ADO and the ADO has concurred with

the sponsor's request in writing. The requirements for ADO concurrence (as well as the associated funding rules) are contained in Paragraph 3-24.

3-42. Consultant Contracts (Qualifications Based with Negotiated Price).

The sponsor requirements for competitive proposals (which includes consultant contracts) are contained in 2 CFR § 200.320(d) (see Paragraph U-16). The current version of Advisory Circular 150/5100-14, Architectural, Engineering, and Planning Consultant Services for Airport Grant Projects, provides sponsor requirements for consulting contracts, including the unique contract methods listed in Table 3-29.

The ADO review of procurement of these types of proposals is optional if the sponsor has submitted the associated sponsor certification.

However, if the sponsor is proposing to deviate from the sponsor procurement requirements per the above advisory circular, the ADO must not issue the associated grant unless the ADO has reviewed the contract and concurs with the deviations. The ADO has the option to document their concurrence either by notifying the sponsor in writing (with a copy to the grant file) or issuing the grant.

Table 3-29 Unique Consultant Contract Methods

Some unique contract methods include…	
a.	Retainers
b.	Cost-plus-a-fixed-fee
c.	Cost-plus-a-percentage-of-cost (note that is prohibited by 2 CFR § 200.323(d) and must not be used)
d.	Indefinite delivery (also called task orders and work authorizations)

3-43. Design-Build and Construction Manager-at-Risk Contracts.

The sponsor procurement requirements for these types of competitive proposals are contained in Paragraph U-16).

Mandatory ADO pre-review and concurrence with the sponsor's use of design-build proposal for AIP funded projects is based on requirements found in 49 USC § 47142(a)(2). ADO pre-review and concurrence is also required by FAA policy for any AIP-funded project where construction manager at risk or other competitive proposal methods that involve selection based on factors other than price are proposed.

In order for the ADO to concur with the proposal, the ADO must be satisfied that the requirements of 2 CFR § 200.320(d) have been met (see Paragraph U-16) prior to the sponsor awarding the contract.

The ADO documents their concurrence by issuing the grant.

3-44. Engineering Materials Arrestor System (EMAS).

Prior to April 2012, there was only one manufacturer whose product met the requirements of the current version of Advisory Circular 150/5220-22, Engineered Materials Arresting Systems (EMAS) for Aircraft Overruns. As of the date of Change 1 of this Handbook, two manufacturers meet these requirements. Therefore, the sponsor must currently procure the EMAS project under the competitive proposal procurement method per 2 CFR § 200.320(d) as discussed in Paragraph U-16. If only one manufacturer responds to the Request for Information (RFI), then the sponsor may proceed with noncompetitive procurement per 2 CFR § 200.320(f).

The competitive proposal procurement process for EMAS is outlined in Table 3-30. The ADO has the option to contact AAS-100 or APP-500 for assistance.

For existing EMAS, if the Sponsor and ADO concur that an existing bed must be replaced, then the procurement requirements for new EMAS installation apply. The sponsor must follow the competitive procurement process to select the vendor.

If the ADO determines that a bed must be retrofitted, the sponsor must determine whether the bed can only be modified or retrofitted by the original vendor, and whether the cost benefit of replacing the bed outweighs the cost benefit of retrofit.

Table 3-30 Typical Steps for an RSA Project with EMAS

An RSA project with EMAS will typically follow the following steps…	
a.	Frequently, the EMAS installation is only a part of a larger Runway Safety Area (RSA) project. Therefore, the EMAS design is incorporated into the overall project. The EMAS Request for Proposal (RFP) will require that the selected EMAS vendor work with the overall RSA design consultant to incorporate the specific features of the selected EMAS into the overall RSA project.
b.	The sponsor conceptually considers EMAS during the planning and environmental phase of the RSA project, and selects a RSA design consultant (RSA designer).
c.	The sponsor and RSA designer identify the requirement for EMAS. The requirements will include the proposed RSA limits, the limits of the EMAS footprint, any navigational aids within the RSA and nearby, and any unique surrounding elements that may be adversely affected by the size of the EMAS bed exceeding a certain height, length or width.
d.	The sponsor issues a Request for Information (RFI) to obtain conceptual designs from EMAS vendors. The RFI is issued solely for informational purposes and is not a solicitation. Similarly, responses to RFI's are not offers from the EMAS vendors.
e.	The sponsor prepares the preliminary design and a Request for Proposal (RFP) that is used to select the EMAS vendor.
f.	The sponsor coordinates the RFP package with the ADO.

Table 3-30 Typical Steps for an RSA Project with EMAS

An RSA project with EMAS will typically follow the following steps…	
g.	After receiving ADO concurrence with the RFP package, sponsor completes the RFP process, and selects an EMAS vendor.
h.	Prior to the sponsor's final selection and award, the ADO has the option to review the sponsor's evaluation and rating.
i.	The sponsor, RSA designer, general contractor and EMAS vendor complete the RSA design and construction.

3-45. Bid Alternates (Including Life Cycle Cost Analysis Alternates) and Bid Additives.

The sponsor requirements for contracts containing bid alternates (including the use of life cycle cost analysis) and additives are contained in Paragraph U-15. The ADO has the option to request and review the bid package to ensure that the sponsor has correctly established how the award will be made within the bid package (commonly referred to as the basis for award). Otherwise, the ADO has the option to accept sponsor certification.

The ADO has the option to document their determination either by notifying the sponsor in writing (with a copy to the grant file) or issuing the grant.

3-46. Bidding Asphalt and Concrete Alternates.

Bidding of both asphalt and concrete options is an example of the use of bid alternates, therefore, the requirements in Paragraph 3-45 apply.

A sponsor has the option to design and bid both asphalt and concrete alternatives for a project. However, only one design is normally allowable (the selected option). Design costs of the non-selected option are limited to the lesser of 1) the difference in the bid schedule amounts between the selected and non-selected low bidders and 2) the non-selected option design costs. The design contract must clearly delineate the design costs of the two alternatives.

If the life cycle cost analysis and selection of the pavement structure is conducted at the conceptual 30 percent design stage, the above funding restrictions on the design do not apply.

3-47. Buy American Requirements.

The Buy American Preferences under 49 USC § 50101 require that all steel and manufactured goods used in AIP funded projects are produced in the United States. Detailed sponsor and ADO requirements are included in Appendix X.

3-48. DOT Office of Inspector General (OIG) Notification of Potential Procurement/Bid Improprieties.

The ADO must contact the OIG through the DOT OIG hotline (see Appendix B for link) if they suspect any of the activities listed in Table 3-31 on an AIP project. As of January 2015, the ADO is no longer required to notify OIG in every instance where there are insufficient bidders, only where the ADO suspects inappropriate activity.

Insufficient bidders were previously defined as either a) five or fewer bidders on a construction project where the low bid was greater than the engineer's estimate and the bid was $500,000 or more or b) there was only a single bidder on a construction contract and the bid was $250,000 or more. This former notification requirement had been implemented based on a 1983 OIG finding and a subsequent meeting between the OIG and the FAA Office of Airports. The 1983 values were adjusted for inflation by the FAA.

The ADO can find more discussion on contract fraud in a paper called Suggestions for the Detection and Prevention of Construction Contract Bid Rigging (see Appendix B for link).

Table 3-31 Circumstances Requiring OIG Notification

ADO must contact the OIG if they suspect any of the following on an AIP project...
a. Contract and Grant Fraud
b. Environmental, Health, and Safety Violations
c. Computer Crimes
d. Product Substitution and Suspect/Counterfeit Parts
e. Bribery, Kickbacks, and Gratuities
f. False Statements and False Claims
g. Conflicts of Interest and Ethics Violations
h. Travel Fraud
i. Theft or Abuse of Government Property
j. Violation(s) of Criminal Law and/or the Civil False Claims Act in Connection with a Federal Contract
k. Other Violations of Federal Laws and Regulations

The above requirement was originally implemented based on a 1983 OIG finding and a subsequent meeting between the OIG and the FAA Office of Airports (the 1983 values have been adjusted for inflation by the FAA). The ADO can find definitions and more discussion on bid rigging, collusion, and unbalanced bidding in a paper called Suggestions for the Detection and Prevention of Construction Contract Bid Rigging (see Appendix B for link).

3-49. Escalator Clauses.

Per FAA policy, the FAA will not fund any costs in a contract that are subject to an escalator clause unless specifically approved by APP-1. Generally, APP-1 has not approved AIP funding for escalator clauses because AIP project grant amendments are limited by 49 USC § 47108(b)(3) and because the construction projects are usually of short duration.

Per FAA policy, sponsors must send their request to the ADO and obtain written APP-1 approval before awarding contracts containing an escalator clause (see Paragraph U-21).

If APP-1 does not approve the sponsor's request, the ADO has the option of allowing the sponsor to keep the escalator clause in the contract as a non-AIP funded work item provided that the requirements in Paragraph 3-39 are met.

The ADO must provide a copy of the written determination to the sponsor and place a copy in the grant file.

3-50. Plans and Specifications Review.

Per 2 CFR § 200.324(a), the ADO has the option to review the sponsor's technical specifications (including plans and specifications, engineer's report, and any other items within the procurement package) at any time during the process. However, the FAA policy on ADO review is discussed further in Paragraph 3-28.

3-51. Pre-award Review of Contracts.

2 CFR § 200.324(b) gives the ADO the option to conduct a pre-award review for the situations contained in Table 3-32. Otherwise, the ADO has the option to accept sponsor certification.

It is FAA policy that sponsors notify the ADO when any of these situations exist. If the ADO conducts the review, the ADO has the option to provide the sponsor with a written response containing the ADO finding. If the ADO provides a written response, the ADO must file a copy of the response in the grant file.

Table 3-32 Situations Where the ADO has the Option to Conduct a Pre-Award Review

Situations include…	
a.	A sponsor's procurement procedures or operation fails to comply with the procurement standards in 2 CFR §§ 200.317-200.326.
b.	The procurement is expected to exceed the simplified acquisition threshold (provided in Table U-7) and is to be awarded without competition, or only one bid or offer is received in response to a solicitation.
c.	The procurement, which is expected to exceed the simplified acquisition threshold (provided in Table U-7), specifies a *brand name* product.

Table 3-32 Situations Where the ADO has the Option to Conduct a Pre-Award Review

Situations include…
d. The proposed award is more than the simplified acquisition threshold (provided in Table U-7) and is to be awarded to other than the apparent low bidder under a sealed bid procurement.
e. A proposed contract modification changes the scope of a contract or increases the contract amount by more than the simplified acquisition threshold (provided in Table U-7). Note that although the ADO is not required to conduct a pre-award review, the ADO must conduct a review prior to the grant being amended or closed as discussed in Paragraph 5-35.

3-52. Sponsor's Procurement System.

Per 2 CFR § 200.324(c) (see Paragraph U-22), the ADO must review a sponsor's procurement system unless the sponsor has submitted a sponsor certification that the system meets the requirements of 2 CFR §§ 200.317-200.326.

If the ADO must conduct a review, the ADO has the option to provide the sponsor with a written response containing the ADO findings and/or keep a copy available for future reference.

3-53. Force Account Work.

Sponsor force account work is planning, engineering, or construction work done by the sponsor's employees. Unlike other such work, it is done without the benefit of a construction or consultant contract obtained through the normal procurement process rules in 2 CFR §§ 200.317-200.326. Force account work is allowable per 2 CFR part 200 Subpart E (OMB Circular A-87, Cost Principles for State, Local, and Indian Tribal Governments).

Per FAA policy, in order for the sponsor to use force account work, the sponsor must request the use of force account work in writing and the ADO must have approved the request *in advance of the grant offer*. In addition, it is in the best interest of the sponsor to obtain ADO approval *prior to the sponsor starting the work* to ensure that the work is allowable. The sponsor's written request must meet the requirements in Table 3-33.

Per FAA policy, the sponsor must provide the ADO with detailed documentation of all force account costs incurred as outlined in Table 3-34. In addition, the sponsor must follow the additional requirements in Table 3-35. The ADO must provide a copy of the written determination to the sponsor and place a copy in the grant file.

The ADO must not approve the use of force account for environmental work if the FAA is responsible for performing or procuring the work per the current version of FAA Order 5050.4, National Environmental Policy Act (NEPA) Implementing Instructions for Airport Projects.

Table 3-33 Sponsor Force Account Submittal Requirements

Sponsors must include the following in their written request…
a. Project Scope. The sponsor must provide adequate details showing the nature and extent of the work to be performed using force account.
b. Justification. The sponsor must provide justification for doing the work by force account rather than by contract. The sponsor must clearly show that the benefits, including benefits to the Federal government, of using force account override the Federal policy of competitive bidding or negotiated contracts.
c. Personnel Qualifications. The sponsor must provide information on the ability of their personnel to perform the force account work.
d. Detailed Cost Estimate. The sponsor must provide estimate of costs, including wage rates, non-salary expenses, indirect costs, and comparison of costs between the sponsor's force account and normal procurement methods.
e. Sponsor's Resources. The sponsor must provide information on sponsor's resources (labor, material, equipment, and financing) and workload as they affect capacity to do the work, date by which the work will be complete, or dates within which the work will take place. Enough funds must be available to the sponsor to carry payrolls and any necessary purchases of materials and rental equipment.
f. Cost Analysis. The sponsor must prepare a cost analysis per 2 CFR § 200.323 (see Paragraph U-21) and submit a copy to the ADO. The cost analysis can be used by the ADO to determine is the costs are reasonable.

Table 3-34 Sponsor Force Account Documentation Requirements

Sponsors must document actual costs as follows…
a. Personnel. Because sponsor employees often work on multiple projects, or on activities outside the project in the AIP grant, sponsors must submit timesheets (or a suitable report from an automated payroll accounting system) to the ADO to support these salaries and wages. A sponsor must base their charges upon actual payroll information documented under their agency's generally accepted practice. This payroll information must be reviewed and approved by the sponsor's responsible official. The timesheets must properly document all of the hours worked by the employees, regardless if they were on the AIP project or not. These above requirements are discussed in more detail in 2 CFR § 200.430 (Attachment B, Paragraph 8, of OMB Circular A-87, Cost Principles for State, Local, and Indian Tribal Governments). The expense must be directly related to the AIP project. Arbitrary or prorated costs are not allowable.
b. Equipment. Equipment rental rates applicable to the construction on force account development vary widely. It is recommended that sponsors use the U.S. Army Corps of Engineers Construction Equipment Ownership and Operating Expense Schedule (EP-1110-1-8) to determine the equipment rates. The purchase price of equipment bought by the sponsor for use on a force account project is *not* allowable, only this calculated rental and operating rate.

Table 3-34 Sponsor Force Account Documentation Requirements

Sponsors must document actual costs as follows…
c. **Supplies and Material**. All supplies and materials must follow the procurement requirements in 2 CFR §§ 200.317-200.326 (see Appendix U) and the sponsor must keep records to document these costs.

Table 3-35 Other Sponsor Force Account Requirements

Other requirements include…
a. **Reporting.** Construction and project reporting requirements are the same as those under a traditional contract
b. **FAA Standards.** Force account work must meet the same engineering and construction standards that are required under a traditional contract.
c. **Labor Standards.** Cost of labor and supervision must be in accordance with state and local standards.
d. **Insurance.** It is the sponsor's responsibility to comply with state and local insurance requirements.
e. **Project Changes.** The sponsor must obtain prior ADO approval to change the scope of the force account work. Sponsors must make these requests in writing.

3-54. Value Engineering.

Value engineering is the systematic application of recognized techniques that identify the function of a project or service and provide the best function reliably at lowest overall cost.

2 CFR § 200.318(g) encourages sponsors to use value engineering. The sponsor requirements for value engineering are contained in Paragraph U-10, which, by FAA policy, is required for new primary airports. In addition, ADOs have the option to require sponsors to use value engineering for unusually complex projects of greater than average costs (or require cost-benefit studies, present worth analysis, the study of alternatives, tactical planning, or other forms of technical evaluation).

The ADO must have concurred in writing with the use and scope of services for the value engineering prior to the work commencing. The ADO must place a copy of the concurrence in the grant file.

ADO's are cautioned that significant advance preparation may be needed to comply with the current version of Advisory Circular 150/5300-15, Use of Value Engineering for Engineering and Design of Airport Grant Projects.

3-55. Indefinite Delivery (Task Orders) Extensions for *Construction* Services.

Per FAA policy, a sponsor may not extend a task order contract for construction services beyond a one-year duration (without re-advertising the contract) unless the ADO concurs with this action. This is because AIP funded construction must be based on current Davis-Bacon wage rates, which are updated at least on a yearly basis.

For the ADO to concur with the extension, the sponsor must provide compelling justification and the ADO must be able to agree that the economic conditions and wage rates and project costs have remained unchanged. Per FAA policy, the ADO must not concur with more than four extensions to the same task orders.

3-56. Indefinite Delivery (Task Orders) Extensions for *Consultant* Services.

The sponsor must define the proposed projects, services, and estimated schedule as part of the procurement process. The sponsor must limit the procurement to those projects and services that can reasonably be started within five years of the final procurement selection. Per FAA policy, a sponsor may not extend a task order contract for consultant services beyond a total overall contract duration (without re-advertising the contract) of more than five years. This time limitation has been established so that competition is not unduly restricted. Unless otherwise approved in writing by the ADO, the sponsor must not add additional projects or services to the contract.

3-57. Suspension or Debarment of Persons or Companies.

Suspension and debarment are actions that a Federal agency takes to prohibit certain person or company from bidding on projects, receiving contracts or grants, or participating in federally funded contracts or grants. If a person or company is suspended or debarred by a Federal agency, the suspension or debarment extends to all Federal programs and procurement.

Suspension and debarment applies to contractors and subcontractors at any level, including suppliers, fee appraisers, inspectors, real estate agents, consultants, architects, engineers, and attorneys. It also applies to any others that are associated with the suspended or debarred person or company.

Additional information on suspension and debarment is available on the FHWA Construction Program Guide/Suspension and Debarment and the current version of DOT Order 4200.5, Suspension and Debarment, and Ineligibly Procedures. These are based on 2 CFR part 180 and 2 CFR part 1200. Note APP-500 is the Suspension and Debarment Official for AIP.

Paragraph U-5 contains the requirements sponsors must follow regarding persons or companies that have been excluded from working on AIP funded projects. Table 3-36 contains the ADO requirements.

Table 3-36 ADO Requirements Regarding Suspension or Debarment

For the following…	The ADO requirements include…
a. The sponsor is awarding a contract.	Per FAA policy, the ADO has the option to accept sponsor certification that the sponsor did the appropriate checks to assure that contracts or subcontracts are not awarded to suspended, debarred, or excluded firms or individual. Per FAA policy, the ADO also has the option to request additional information from the sponsor so the ADO can conduct a more thorough review. If the ADO believes the sponsor requirements were met, no further action or documentation by the ADO is required. If the sponsor requirements were not met, the ADO must contact their regional contact in the FAA Office of the Chief Counsel – Airports and Environmental Law Division (AGC-600) to determine the course of action.
b. A person or company currently working on an AIP project is suspended or debarred.	If the ADO becomes aware of this situation, per FAA policy, the ADO must contact their regional contact in AGC-600 to determine the course of action.
c. It appears that a person or company might need to be suspended or debarred.	If the ADO becomes aware of this situation, per FAA policy, the ADO must contact their regional contact in AGC-600 to determine the course of action.

Section 11. Cost Allowable.

3-58. Allowable Cost Legislation and Policy.

The documents listed in Table 3-37 provide guidance to the ADO on how to determine what costs are allowable and necessary within AIP funded projects.

49 USC § 47110(b) contains the five basic requirements that must be met for an ADO to determine that a cost is allowable. These five basic requirements are discussed in further detail in the following sections, as listed in Table 3-38.

In addition, the FAA has made a number of policy decisions on specific project cost items, which are discussed in further detail in the rest of this section.

Table 3-37 Resources to Determine if a Project Cost is Necessary and Allowable

The resources include…
a. The Act. 49 USC § 47110(b) contains the basic five requirements that must be met for an ADO to determine that a cost is allowable.
b. 2 CFR part 200 Subpart E (OMB Circular A-87, Cost Principles for State, Local, and Indian Tribal Governments). 2 CFR part 200 Subpart E (OMB Circular A-87, Cost Principles for State, Local, and Indian Tribal Governments) provides the principles that the ADO must use to determine if a cost is allowable for AIP funded projects.
c. The Single Audit Act of 1984. The Single Audit Act of 1984, Public Law 98-502 (as amended in 1996, Public Law 104-156, as amended and recodified at 31 USC § 7501 et seq.) is implemented by 2 CFR part 200 Subpart F (OMB Circular A-133, Audits of State, Local Governments, and Nonprofit Organizations). Although it is not this document's primary purpose, the Single Audit Act of 1984 provides valuable information about how to make allowable cost determinations.

Table 3-38 Five Basic Requirements to Determine a Cost is Allowable

For the following basic requirement…	The requirements are in…
a. Costs Necessary (Allowable Cost Rule #1)	Section 12
b. Costs Incurred after Grant Executed (Allowable Cost Rule #2).	Section 13
c. Costs Reasonable (Allowable Cost Rule #3).	Section 14
d. Costs Not in Another Federal Grant (Allowable Cost Rule #4).	Section 15
e. Costs within Federal Share (Allowable Cost Rule #5).	Section 16

3-59. Unallowable Cost Table.

Appendix C contains tables that the ADO can use to help determine if the FAA has previously identified a project or cost to be ineligible or unallowable.

3-60. Administrative Costs.

The ADO may determine that administrative costs are allowable direct charges to a grant if the administrative costs are required to carry out the grant project. Examples of common administrative costs and their requirements are included in Table 3-39.

Administrative costs must not include planning, engineering, or construction work and are therefore not considered force account work . Administrative costs may include work done by a sponsor or by another entity, such as an attorney. Administrative costs must be supported by

vouchers, receipts, personnel activity reports, or other verifiable documentation. Administrative costs must not represent a pro-rated allocation of time or expenses.

By FAA policy, a line item for *estimated* administrative costs can be included in the grant application if the sponsor cannot accurately calculate the total administrative costs. However, these estimated administrative costs must not exceed 2% of the grant amount or $10,000, whichever is less.

Once a grant is issued, the payment requests for administrative costs must represent actual costs and must be supported by appropriate documentation. Claims may not represent an estimated, allocated, or prorated cost.

Table 3-39 Administrative Costs Examples and Requirements

For the following example…	The following requirements apply…
a. Sponsor Employee Time. The cost for a sponsor's employee's time directly related to administrative tasks that are required to complete an AIP project The cost for a sponsor's employee's time includes the employee hourly salary; and costs related to the hourly rate such as Medicare, Social Security, federal/state/local taxes	**(1)** The ADO must determine that the work that is going to be accomplished by the sponsor's employees is *required* to carry out the AIP project. This is required because 49 USC § 47110(b) limits reimbursement to costs that are, "necessarily incurred in carrying out the project in compliance with the grant agreement," and establishes that costs must be "reasonable in amount". **(2)** The sponsor must have a time tracking system in place that tracks all hours that its employees work. **(3)** Because sponsor employees often work on multiple projects, or on activities outside the project in the AIP grant, sponsors must submit timesheets (or a suitable report from an automated payroll accounting system) to the ADO. **(4)** The timesheets must properly document all of the hours worked by the employees, regardless if they were on the AIP project or not. **(5)** A sponsor must base their charges upon actual payroll information documented under their agency's generally accepted practice. This payroll information must be reviewed and approved by the sponsor's responsible official. **(6)** A copy of the sponsor's responsible official's written approval must be provided to the ADO. **(7)** These above requirements are discussed in more detail in 2 CFR § 200.430 (Attachment B, Paragraph 8, of OMB Circular A-87, Cost Principles for State, Local, and Indian Tribal Governments). **(8)** The expense must be directly required by and related to the AIP project. These are normally limited to project specific costs such as preparation of an independent fee estimate, legal review of a construction contract, and submission of FAA required project reports. Costs that are not directly related, or are prorated, are not allowable. **(9)** Costs to administer the AIP grant *program* are not allowable.
b. Overhead Costs. Anything more than direct employee's time. These normally consist of support services such as accounting, billing, building rent, and utilities that cannot be attributed to one specific project or activity.	**(1)** These are considered indirect costs, which are discussed in Paragraph 3-61.

Table 3-39 Administrative Costs Examples and Requirements

For the following example…	The following requirements apply…
c. Sponsor Employee Expenses (such as tolls, mileage, and parking).	**(1)** The expense must be reasonable, be directly related to the AIP project, and be supported by a receipt or voucher.
d. Legal Fees.	**(1)** The expense must be reasonable, be directly related to the AIP project, and be supported by an invoice.
e. Independent Fee Estimates.	**(1)** The expense must be reasonable, be directly related to the AIP project, and be supported by an invoice.
f. Newspaper Advertisements/ Announcements in Publications.	**(1)** The expense must be reasonable, be directly related to the AIP project, and be supported by an invoice.
g. Audit Fees.	**(1)** The expense must be reasonable, be directly related to an AIP project (in this grant or in a prior grant), and be supported by an invoice. **(2)** The audit must be required by, and performed in accordance with, the Single Audit Act, as implemented by 2 CFR part 200, Subpart F (OMB Circular A-133, Audits of States, Local Governments, and Non-Profit Organizations). **(3)** If the audit includes other Federal programs beyond AIP, the costs are prorated to include only the AIP portion. **(4)** It is the opinion of the FAA that sponsors that are issued subgrants under a state block grant are responsible for obtaining the single audit and for the payment of the audit costs. Therefore, the request for reimbursement of these costs is tied to the subgrant.

3-61. Indirect Costs.

The FAA's policy allows a sponsor's indirect costs to be charged to the sponsor's employee's hourly salary for time working on an AIP grant if the indirect cost rate (IDC) was calculated based on the requirements in Table 3-40. The FAA policy allows indirect costs to be applied only to the direct wages and salaries of a sponsor's employees (not to other project costs).

Table 3-40 Requirements for Indirect Costs

The following requirements apply…
a. Indirect or Overhead Costs. Costs incurred by a sponsor for other than employee's direct time. Allowable items of cost that make up indirect costs may include costs for support services such as accounting, billing, building rent, and utilities that cannot be attributed to one specific project or activity can be allocated via federally-sanctioned formula to the grant.
b. Indirect Cost Rate Calculation. Indirect or overhead costs are potentially allowable only if the sponsor meets one of the following two criteria for calculation of the indirect cost rate. **(1)** The sponsor has a Cost Allocation Plan approved by the cognizant Federal agency. In addition, the sponsor has and an executed indirect cost rate agreement developed in accordance with 2 CFR part 200 Subpart E (OMB Circular A-87, Cost Principles for State, Local, and Indian Tribal Governments). These two documents are needed by the ADO to determine what percentage of the costs, if any, can be allocated to of modified total direct cost (MTDC). **(2)** If a sponsor does not have a Cost Allocation Plan, the sponsor has the option to charge a de minimis rate of 10% of modified total direct cost (MTDC) per 2 CFR § 200.414(f).
c. Modified Total Direct Cost (MTDC). Per FAA policy, the allowable MTDC is the cost for a sponsor's employee's time directly related to administrative tasks that are required to complete an AIP project The cost for a sponsor's employee's time includes the employee hourly salary; and costs related to the hourly rate such as Medicare, Social Security, federal/state/local taxes.
d. Cognizant Federal Agency. The cognizant agency of the Federal government that must approve or disapprove the Cost Allocation Plan. This agency is generally the Federal agency that has the greatest dollar involvement with a given sponsor. The ADO must contact APP-500 if the ADO has a question regarding whether the FAA is the cognizant agency for a sponsor. For the most part, the FAA is the cognizant agency for airport authorities. The Federal Highway Administration is the cognizant agency for many state departments of transportation and in that role, negotiates the indirect cost rate on behalf of the FAA.
e. FAA Determinations. For those sponsors for which the FAA is the cognizant agency, responsibility for approving or disapproving cost allocation plans and negotiating and executing the indirect cost rate agreement is delegated to the regional division manager. The ADO has the responsibility for review of the cost allocation plan, for signature by the regional division manager, and must use the following documents to make their recommendation: **(1) 2 CFR part 200 Subpart E** (OMB Circular A-87. Cost Principles for State, Local and Indian Tribal Governments). **(2) ASMB C-10**. Cost Principles and Procedures for Establishing Cost Allocation Plans and Indirect Cost Rates for Agreements with the Federal Government (developed by the United States Department of Health and Human Services and dated April 8, 1997). **(3) Financial Assistance Guidance Manual**. This DOT guidance, dated March 2009, replaces DOT Order 4600.17A, Financial Assistance Management Requirements.

Table 3-40 Requirements for Indirect Costs

The following requirements apply…
f. Application of Rate. The rate approved under the cost allocation plan (also referred to as the indirect cost allocation plan rate, or ICAP rate) is applied only to the costs associated with sponsor's employees' hourly rate, inclusive of employer paid costs, such as Medicare, Social Security, and federal, state, and local taxes. For example, if the employee earns $10/hour (including employer paid taxes or benefits) and the rate is 14%, the allowable overhead is $10/hour multiplied by 14%.
g. Indirect Cost Rate Documentation. Sponsors that intend to claim reimbursement for indirect costs must include a signed copy of the approved indirect cost rate and the indirect cost proposal for the grant year in the grant application.

3-62. Architectural Enhancements Costs.

It is FAA policy to support projects that contribute to the architectural and cultural heritage of local communities. In accordance with this policy, sponsors are encouraged in their early planning procedures to use design, art, and architecture to reflect local customs and history of the community or other cultural emphasis as long as this can be accomplished without impairing function, safety, and efficiency of the facility.

Architectural treatment of the inside and outside of buildings to reflect local custom, style, or cultural attitudes is an allowable cost. The work must be architectural in nature (it cannot be for the sole purpose of aesthetic enhancement) and must be in an area accessible by the public. Allowability examples for architectural treatments is contained in Table 3-41.

Table 3-41 Allowability Examples for Architectural Treatments

The cost to…	Is…
a. Apply an adobe finish on the exterior and public interior walls of a terminal in the Southwest.	**Allowable.**
b. Acquire and install terrazzo floors (depicting local scenes) in a non-public area of the terminal.	**Not Allowable.** The type of work is allowable, but because it is not in a public area, it is unallowable.
c. Purchase and install a free standing sculpture in the terminal.	**Not Allowable.** This is a work of art for the sole purpose of aesthetic enhancement. It is not an architectural treatment.

3-63. Benefit-Cost Analysis (BCA) Costs.

Per FAA policy, the costs incurred to prepare a BCA are only allowable as a grant formulation cost for the specific project (not as a stand-alone grant). In addition, these costs cannot be reimbursed until after the BCA shows that the project is justified.

3-64. Construction Costs.

Construction costs are only allowable if they are necessary to complete the project according to the plans and specifications.

3-65. Construction Project Signs Costs.

Project signs at an airport construction sites are not required, but if erected may be an eligible cost if the construction includes at least $200,000 of Federal funds and will be underway for at least three months. The allowable cost of the sign is limited to $1,000. The sign must contain a brief description of the project and the following statement: Part of the funding for this project is being provided by a grant from the Airport Improvement Program, which is administered by the Federal Aviation Administration and financed through the Airport and Airway Trust Fund.

3-66. Computer Software and Data Subscription Costs.

The ADO may approve sponsor requests, on a case-by-case basis, to include a specifically allocated portion of the costs of software acquisition, licensing and/or subscription. The ADO may only approve the portion of the cost that is directly attributable to a specific, FAA-approved AIP project, only for the duration of the approved AIP project, and only for the entity that is actually doing the work for which the software is required.

These costs may include customized commercially available software, but only if the customized software becomes public domain and the sponsor makes it available to any user without cost beyond handling costs.

It is anticipated that the costs of this software will normally be incurred by the sponsor's consultant because the consultant is performing the technical work. The cost for sponsor acquisition of software is not allowable unless it is approved by the ADO for force account work (see Paragraph 3-53).

The costs of ongoing data subscription services, such as those needed for a noise monitoring program, are not allowable. The sponsor is also responsible for the costs of any ongoing vendor service costs that may be needed to access FAA surveillance tracking data.

3-67. Disadvantaged Business Enterprise (DBE) Plan Updates.

The requirement for a sponsor to have a DBE plan is discussed in Paragraph 5-9. A sponsor is required to update their overall DBE program goals within this plan every three years. The cost for this DBE plan update is eligible as project formulation costs in the sponsor's first AIP grant after the update. A sponsor with multiple airports is only required to have one DBE plan (which

covers its airports). Therefore, the sponsor is allowed to apply the cost to update the plan to a grant at any of the airports it owns.

The cost to set the project specific DBE goal is also an eligible project formulation cost for that project.

3-68. Drainage Costs.

The drainage improvements are allowable to the extent the work serves eligible areas and facilities. If the drainage improvement will serve both eligible and ineligible areas/facilities, the allowable cost is limited to prorated share for the eligible portion. The ADO will determine the method of proration. Table 3-42 contains a proration example. In addition, the requirements for including ineligible or non-AIP funded work in the contract in Paragraph 3-39 must be met.

Drainage projects are eligible as stand-alone projects as discussed in Appendix D.

Table 3-42 Drainage Proration Example

For the following situation…	The allowable prorated amount would be…
A project will extend an off-airport drainage box culvert through the airport. This box culvert will also serve the neighborhood adjacent to the airport. The airfield runoff is 20 acres and the neighborhood runoff is 100 acres.	One fifth of the total cost to extend the culvert through the airport (including associated design, inspection, etc.).

3-69. Duct Bank Costs for Ineligible Facilities.

Normally, the cost to install, modify, or enlarge duct banks to support an existing or future ineligible facility is not allowable. There is one exception. These costs are allowable as part of an AIP funded pavement project only if the ADO has determined that they will reduce the need to disturb the AIP funded pavement at a later date.

The acquisition and installation cost of the ineligible utilities and equipment remains unallowable.

3-70. Energy Efficiency (Green/Sustainable) Improvement Costs.

Per 49 USC § 47110(b)(7), the costs to improve the energy efficiency of a building, sometimes referred to as green or sustainable improvements, are allowable. Energy efficiency improvement costs must meet the criteria in Table 3-43.

Note that the requirements for a project for improving the energy efficiency of airport *power sources* are discussed in Section 7 of Chapter 6.

Table 3-43 Criteria for Energy Efficiency Improvement Costs

In order for an energy efficiency improvement cost to be allowable…
a. The cost must be incurred on a measure to improve the efficiency of an airport building (such as a measure designed to meet one or more of the criteria for being considered a high-performance green building as set forth under section 401(13) of the Energy Independence and Security Act of 2007 (42 USC 17061(13))).
b. Any increases in initial project costs must be offset by expected savings over the life cycle of the project. The sponsor must follow the published FAA guidance for calculating the life cycle cost.
c. For building projects, the cost must be incurred on an otherwise eligible and justified airport building project (improving energy efficiency cannot be the justification). A project to improve a building's energy efficiency is not eligible as a stand-alone project.
d. The cost must only include costs which are necessary for the project, such as those for design, construction, testing, and inspection (not for obtaining LEED or similar certification or credits – which is not a necessary cost of the project).
e. For a building which contains eligible and ineligible areas, all costs associated with the measure (such as design, construction, testing, and inspection) must be prorated accordingly. In addition, the requirements for including ineligible or non-AIP funded work in the contract in Paragraph 3-39 must be met.
f. The sponsor must submit the initial project costs, the expected savings over the life of the project, the life cycle cost calculations, and the proration calculations (for building contains eligible and ineligible areas) to the ADO.
g. The costs to redesign or to modify ongoing construction to incorporate energy efficiency measures into the project are only allowable to the extent that the previously incurred design costs are removed from the AIP-funded project.

3-71. Engineering and Architectural (A/E) Costs.

Engineering and architectural costs are only allowable if they are necessary to complete an AIP eligible project. If only part of the project is eligible, the engineering and architectural costs are limited to the prorated eligible amount. Table 3-44 provides examples of some engineering and architectural costs that may be necessary for an AIP project.

Table 3-44 Examples of Engineering and Architectural Costs

Some examples include costs to…
a. Prepare plans and specifications (stand-alone design grants are discussed in Appendix D)
b. Establish and report on *project specific* DBE goals

Table 3-44 Examples of Engineering and Architectural Costs

Some examples include costs to…
c. Conduct initial field investigations
d. Conduct preliminary design
e. Conduct testing
f. Prepare construction management programs and the final test and quality control reports required for projects with pavement costs of $500,000 or more
g. Provide engineering cost estimates
h. Prepare bid documents
i. Evaluate bid proposals
j. Conduct construction inspection
k. Provide technical consulting services
l. Surveying and data collection (see Paragraph 3-77 for guidance on Geographic Information System (GIS) data collection)

3-72. Environmental Finding Costs.

Environmental finding costs are only allowable if they are necessary to complete the project per the current version of FAA Order 5050.4, National Environmental Policy Act (NEPA) Implementing Instructions for Airport Projects.

3-73. Equipment Leasing (instead of Purchase) Costs.

The Act only allows eligible equipment to be purchased, not leased. The exception is when equipment is leased for temporary use to complete an AIP eligible project (either by a contractor or through ADO approved sponsor force account).

In the case of lease/purchase agreements, only the purchase portion of the arrangement is an allowable AIP cost, and the ADO cannot issue the grant for the equipment until after the sponsor executes the option to purchase the equipment.

3-74. Facility Impeding an AIP Development Project – Costs to Rebuild or Relocate in Another Location.

The definition of allowable costs is expenses necessary to complete the project (49 USC § 47110 (b)). Normally, only *demolition* of facilities impeding an AIP development project is considered necessary.

However, there are situations where the cost of rebuilding an impacted facility (or paying to physically relocate it to another location) is an allowable cost. This depends on the ownership and type of the impacted facility. Table 3-45 provides detailed guidance and Table 3-46 provides examples.

For purposes of eligibility, impeding an AIP development project means physical interference with the AIP funded development project. It does not include rebuilding or relocating the facility to mitigate inconveniences to the facility.

In addition, if a facility is eligible for AIP funds, the ADO must also determine that there is no reasonable alternative and the sponsor is not knowingly impacting the facility to justify the participation of AIP funding. By issuing the grant, the ADO is documenting their determination.

Table 3-45 Allowability of Costs to Rebuild or Relocate Facility Impeding an AIP Development Project

If the impacted facility is…	The cost to rebuild or relocate the facility in a new location is…
a. FAA-owned NAVAID or federally owned (other than FAA-owned NAVAID) and is *on airport* property.	**Allowable** only if all of the following criteria are met: **(1)** The ADO has determined: **(a)** The new building or piece of equipment is the same size and function of the original; **(b)** It is not feasible to relocate the original facility or equipment; and **(c)** The allowable cost to construct a new facility to existing construction standards (per 49 USC § 47110(b)(1) does not exceed the cost of relocation of the existing facility. **(2)** If the facility is FAA-owned, the ADO must complete all required coordination with FAA Technical Operations (AJW). As part of the coordination, if AJW determines that the facility is no longer required, it is not eligible for relocation with AIP. It may be eligible to be demolished as an obstruction. Sponsors are advised to consider this possibility during the planning process. **(3)** If the ADO determines that the relocation of the facility is feasible: **(a)** The allowable costs are limited to the relocation costs, the site preparation, and utility installation at the new location. **(b)** AIP participation must not include refurbishing, enhancing or upgrading the impacted facility. **(4)** For FAA facilities, the relocation costs or costs of a new building or piece of equipment must demonstrate a passing (greater than 1.0) benefit-cost ratio.

Table 3-45 Allowability of Costs to Rebuild or Relocate Facility Impeding an AIP Development Project

If the impacted facility is…	The cost to rebuild or relocate the facility in a new location is…
b. Not sponsor or federally owned and is *on airport* property.	**Not allowable (Rebuild).** AIP cannot be used to rebuild the facility in a new location (this is the responsibility of the owner). **Allowable (Purchase).** AIP can be used to purchase the facility at market value. The costs associated with its demolition and removal are also allowable, minus any salvage value. **Allowable (Relocate).** The relocation of the structure or facility to another location on the airport in lieu of purchase is eligible up to the market value of the facility. Nominal incidental costs of the relocation (such as extinguishing a lease) may be included.
c. Not sponsor or federally owned and is *off airport* property.	**Allowable.** Detailed guidance on allowable costs is provided in the current version of Advisory Circular 150/5100-17, Land Acquisition and Relocation Assistance for Airport Improvement Program Assisted Projects. Unless otherwise specified in this advisory circular, relocated facilities (such as roads or utilities) must have an equivalent type and functionality as the existing facility.
d. Sponsor-owned, is *on airport*, and is an AIP eligible stand-alone project.	**Allowable** if the new facility is justified in the same way as if it were a stand-alone project. In other words, if the impacted facility is eligible and justified under AIP regardless of the impacting project, it is allowable to rebuild the facility in another location to the current size justified. Although obstruction removal is an eligible stand-alone project, the facility is only eligible for demolition. The ADO must follow the same funding rules for the demolition that exist for the associated development project. In addition, the cost to rebuild the facility in a new location must follow the funding rules (and any other AIP requirements) that would exist if this were a stand-alone project.

Table 3-45 Allowability of Costs to Rebuild or Relocate Facility Impeding an AIP Development Project

If the impacted facility is…	The cost to rebuild or relocate the facility in a new location is…
e. Sponsor-owned, is *on airport*, is not an AIP eligible stand-alone project, and is required by an FAA change to FAA design standards per 49 USC § 47110(d).	**Allowable** only if all of the following criteria are met: **(1)** This is not a change in category of FAA design standard for the airport due to increased traffic or other circumstances. Rather, this is a change in the actual physical dimension that is required for an airport to meet FAA design standards. **(2)** APP-500 has advised the ADO and regional offices that a change has been made to FAA design standards that may trigger the provisions of 49 USC § 47110(d). Advisory circulars contain both FAA design standards and recommendations. This provision only applies to changes in FAA design standards, not updated or new recommendations. **(3)** The ADO determines that the relocation or replacement is required due to a change in the FAA design standards that were published after February 14, 2012 (the date of enactment of FAA Modernization and Reform Act of 2012, Public Law 112-95). **(4)** The ADO determines that the change is beyond the control of the airport sponsor. **(5)** The ADO determines that the new FAA design standard clearly infringes on the sponsor's facility. **(6)** Only passenger entitlements, state apportionment, or nonprimary entitlements are used. **(7)** If the facility is replaced (rather than relocated), the new facility must have an equivalent type and functionality as the existing facility. **(8)** The change must not be simply a sponsor's preferred alternative. For example, a change in FAA design standards requires reconfiguration of an apron and the sponsor's *preferred alternative* impacts a sponsor-owned hangar. If the ADO determines that there are other design alternatives that will not impact a sponsor-owned hangar (whether or not those are the sponsor's preferred alternative), the cost to rebuild is not allowable. **(9)** The ADO must also determine that there is no other reasonable way to avoid rebuilding the facility and that the sponsor is not trying to knowingly impact a facility so that AIP funds can be used to rebuild it.

Table 3-45 Allowability of Costs to Rebuild or Relocate Facility Impeding an AIP Development Project

If the impacted facility is…	The cost to rebuild or relocate the facility in a new location is…
f. Sponsor-owned, is *on airport*, is not required by a change to FAA design standards, and is *not* an AIP eligible stand-alone project.	**Not allowable.** The only costs that are allowable are the removal or demolition of the facility (minus salvage value) and lease extinguishments in very rare cases. Extinguishment of leases without termination clauses may invoke relocation requirements per 49 CFR § 24.2(9). Extinguishment of non-terminal building leases for leases executed before the date of Change 1 of this Handbook that do not have a termination clause are allowable. For leases executed after the date of Change 1 of this Handbook or that have a termination clause, costs to extinguish the lease are not allowable. For tenant-owned improvements within a sponsor owned terminal, the demolition of the tenant improvements is the only allowable cost. The reason that the cost to rebuild the impacted tenant space is not allowable is because the sponsor has control of airport development and is therefore responsible if a tenant area is in the way of new development. The sponsor also has the option to physically move the facility to another location on the airport up to, but not exceeding, the demolition costs of the facility.

Table 3-46 Examples of Allowability of Costs for Facilities Impeding an AIP Project

For the following impacted facility…	The following costs are allowable…
a. An FAA-owned air traffic control tower with a cab that accommodates six controller positions. The existing structure cannot be dismantled and relocated.	The costs to rebuild the cab based on the current square foot per controller standards needed to accommodate six controller positions up to the cost of relocating the existing facility. Even though this may result in a larger cab, this cost is allowable because the facility has to be built to the same functionality. However, if the FAA Air Traffic Organization (ATO) wants to upgrade the facility above the current functionality, the ATO is allowed to pay for the increase in cost. (This combination of AIP and ATO funding is allowable.) Note that all air traffic control tower relocations must be sited through the Airport Facilities Terminal Integration Laboratory (AFTIL) based on the current version of FAA Order 6480.4, Air Traffic Control Tower Siting Process.

Table 3-46 Examples of Allowability of Costs for Facilities Impeding an AIP Project

For the following impacted facility…	The following costs are allowable…
b. An existing FAA-owned approach lighting system equipment shelter. The ADO has determined that the shelter can be relocated. ATO wants to take the opportunity to also refurbish the interior electrical system of the shelter.	The cost to relocate the equipment shelter. ATO is responsible for any upgrades to the shelter as a separate project.
c. An existing FAA-owned Visual Approach Slope Indicator (VASI). ATO proposes that the ADO pay to replace the VASI with a precision approach path indicator (PAPI). The ADO has determined that it *is* feasible to relocate the existing VASI.	The cost to relocate the VASI or the cost to install the new ATO-provided precision approach path indicator PAPI (up to but not exceeding the cost of the VASI relocation cost). If a new ATO-provided PAPI is installed, any cost above the VASI relocation cost (per engineering estimates) must be paid for directly by ATO. (This combination of AIP and ATO funding is allowable.) The sponsor must obtain the PAPI from ATO through a reimbursable agreement. This is because the PAPI may not be supported by ATO if the sponsor uses the normal procurement process.
d. An existing FAA-owned VASI. ATO proposes that the ADO pay to replace the visual approach slope indicators (VASI) with a precision approach path indicator (PAPI). The ADO has determined that it is *not* feasible to relocate the existing VASI.	The cost to purchase and install a new PAPI. Even though the PAPI is an upgrade, because the FAA no longer purchases and installs VASIs, a PAPI is the only option to provide equivalent functionality and is therefore allowable. The sponsor must obtain the PAPI from ATO through a reimbursable agreement. This is because the PAPI may not be supported by ATO if the sponsor uses the normal procurement process.
e. An airport administration office in the sponsor-owned terminal.	The cost to demolish the office area. The terminal is airport owned and the airport administration office is not AIP eligible, therefore rebuilding the office in a new location is not allowable.
f. A passenger holding area at a non-exclusive use gate in the sponsor-owned terminal.	The cost to demolish the passenger holding area and rebuild it in another location. The costs can include an area up to the size the ADO would consider eligible if it were a stand-alone project.
g. A sponsor-owned T-Hangar at a GA airport. The ADO has determined that the AIP project impacting the T-Hangar could be located elsewhere on the airport.	The cost to demolish the T-Hangar. The sponsor is choosing to unnecessarily impact the T-Hangar, so the cost to rebuild the T-Hangar in another location is unnecessary and is not allowable.

Table 3-46 Examples of Allowability of Costs for Facilities Impeding an AIP Project

For the following impacted facility…	The following costs are allowable…
h. A sponsor-owned T-Hangar at a GA airport. The ADO has determined that the AIP project impacting the T-Hangar could not be located elsewhere on the airport and that the sponsor is not trying to knowingly impact the building so that AIP funds can be used to rebuild it.	The cost to demolish the T-Hangar and rebuild (or relocate) it in a new location up to the size and specifications the ADO would consider to be eligible if it were a stand-alone project. However, since this is a revenue-producing aeronautical support facility, only non-primary entitlements can be used to rebuild the T-Hangar. In addition, the sponsor is restricted from using all but non-primary entitlements for that fiscal year as well as the next two fiscal years.
i. An ARFF building. The existing building does not meet the current construction standards for earthquake protection, nor, based on the ADOs calculations, is it big enough to address the existing 14 CFR part 139 requirements. The ADO has also determined that there is no other reasonable way to avoid rebuilding the facility and that the sponsor is not trying to knowingly impact the building so that AIP funds can be used to rebuild it.	The costs to demolish the ARFF building, rebuild it in a new location, enlarge it to meet the 14 CFR part 139 requirements, and bring it up to the current construction standards for earthquake protection.
j. A sponsor-owned T-Hangar at a primary airport that is directly impacted by a change in FAA design standards. The ADO has determined that the only reason the T-Hangar must be relocated is due to a change in FAA dimensional design standards issued after February 14, 2012. Note that a change in an FAA *recommended design practice* is not a change in FAA design standard.	The cost to demolish the T-Hangar and rebuild (or relocate) it in a new location if all of the other requirements in Table 3-45 for this type of project have been met.

3-75. Flight Check.

If a flight check is required by the FAA to commission an AIP-funded NAVAID, the cost of one flight check under a reimbursable agreement with the FAA, and the associated costs for the contractor to participate, is allowable. In the instance that FAA cancels a flight check and the sponsor incurs costs from having the contractor on site for the flight check, these costs may also be allowable. However, the cost for failed flight checks are not allowable.

3-76. Force Account Costs.

Sponsor force account work is planning, engineering, or construction work done by the sponsor's employees. These costs are only allowable if they are necessary to complete the project and have been approved by the ADO as discussed in Paragraph 3-53.

3-77. Geographic Information System (GIS) Data Collection.

GIS data collection is an allowable costs if it meets the requirements in Table 3-47. The Airports GIS surveying and data collection efforts that allowed surveying beyond that allowed in the table are no longer in effect.

Table 3-47 GIS Data Collection Cost Requirements

For GIS work within the following type of project…	The following restrictions apply…
a. AIP funded development.	**(1)** The scope of the field survey, data collection, and uploading to the Airports GIS program must be directly required by the AIP funded development project. **(2)** The costs must be limited to that required to complete the AIP funded development project. **(3)** The field survey, data collection, and uploading to the Airports GIS program is in accordance with FAA surveying standards.
b. AIP funded planning.	**(1)** Because a planning study is expected to result in an FAA-approved airport layout plan that reflects future conditions for the entire airport, the scope of the grant may include Airports GIS-compliant surveying for the entire airport consistent with the FAA's established surveying standards for Airports GIS—regardless of whether the airport sponsor chooses to characterize the planning study as a master plan or master plan update, or some other type of planning study. **(2)** In extraordinary circumstances, a planning study may be conducted in phases, in which case it is permissible to include the full-airport survey work in a Phase 1 planning grant—i.e., a grant whose scope does not include the final master plan or ALP documents. However, in such cases, the grant must include a special condition (the automated AIP system contains the current available special conditions). **(3)** State or metropolitan system planning studies are used to study the performance and interaction of an entire aviation system in a specific geographic area. As such, AIP-funded system planning grants may not generally include whole-airport surveys unless specifically approved by APP-400 and APP-500. **(4)** The field survey, data collection, and uploading to the Airports GIS program must be in accordance with FAA surveying standards.

3-78. Heated Airfield Pavement.

The cost of a heating system for airfield pavement, as defined in the current version of Advisory Circular 150/5370-17, Airside Use of Heated Pavement Systems, is eligible under AIP. However, the sponsor must justify the costs with a positive benefit-cost analysis. In addition, the ADO must remove the pavement from subsequent snow removal calculations when determining AIP eligible snow removal equipment.

3-79. Historic Building Costs.

If a structure is being impacted as part of an eligible AIP project (including land acquisition and noise mitigation) and the structure is on (or eligible for listing on) the National Register, as amended, the associated costs required by Section 106 of the National Historic Preservation Act of 1966, Public Law 89-665 (codified as amended at 16 USC § 470h-2) are allowable.

3-80. Hydrant Fuel Lines and Pit Costs.

The incidental cost of installing aircraft fuel lines and pits as part of an aircraft apron project is an allowable cost. Per FAA policy, the costs must be prorated to include only the portion of the lines and pits physically under the AIP funded apron project. These costs are allowable because they will reduce the need to disturb the AIP funded apron at a later date. The requirements for including ineligible or non-AIP funded work in the contract in Paragraph 3-39 must be met.

3-81. Land Acquisition Costs.

It is FAA policy that costs associated with a land acquisition (such as appraisals, legal fees, etc.) are not allowable until *after* the sponsor has submitted evidence satisfactory to the ADO that the sponsor will obtain good title to the land. Typical examples of this evidence are a binding purchase agreement that will convey good title, evidence of a condemnation deposit, a condemnation award, or a court settlement. Until the sponsor meets this requirement, there is no guarantee that the land acquisition will be completed. Therefore, while the ADO may issue a grant for land acquisition before the sponsor submits satisfactory evidence that good title will be acquired, sponsors must not submit payment requests until these conditions are met.

Some of the common allowable land costs and their associated restrictions are listed in Table 3-48. All of these costs need to be necessary and reasonable in amount. The ADO must only fund cost allowed under 49 CFR part 24 and may contact APP-400 for assistance.

Table 3-48 Common Allowable Land Costs and Associated Restrictions

For the following cost…	The following restrictions apply…
a. Appraisals	One appraisal of each property to be acquired is allowed unless the ADO concurs that a second, full appraisal is justified. Generally, a property with potential fair market value over $500,000 may require a second appraisal. Complex appraisal assignments may also require two appraisals to ensure adequate market research and analysis is secured to support appraised values. The sponsor must ensure all appraisal reports to establish the just compensation offer to the property owner are reviewed by qualified review appraiser and approved as required under 49 CFR part 24.
b. Title Evidence	The reasonable and necessary cost of title evidence (title search and acquisition closing procedures to ensure marketable clear title to property is conveyed to the airport) is allowable. The sponsor's attorney must certify to ADO that good title has been acquired and may rely on title insurance (title company commitment of insurance of marketable title), or title abstract or an attorney's certificate of title. Per FAA policy, AIP reimbursement of the title insurance costs must not exceed $1000 per parcel.
c. Exhibit A Update	Per FAA policy, the sponsor is required to maintain a current Exhibit A (property inventory map). The cost to update the Exhibit A is both a required and an allowable cost in a land project. An airport property map is not a substitute for an Exhibit A.
d. Condemnation Awards	The ADO may accept the cost of land or property interest established by the courts in a condemnation proceeding as a reasonable cost, even though it is above current appraised value. Reasonable attorney fees, delay interest, and acceptable incidental expenses included in a court award to land owners in a condemnation action are allowable costs. If the sponsor and their legal counsel determine that the award was excessive or unreasonable, they must evaluate whether to appeal the award. The sponsor and their legal counsel are encouraged to appeal an unfavorable award if there is good reason to believe that the amount of the award will be significantly reduced on appeal or retrial.

Table 3-48 Common Allowable Land Costs and Associated Restrictions

For the following cost…	The following restrictions apply…
e. Relocation Assistance Costs	Relocation assistance and eligible payment requirements are described in 49 CFR part 24. These are required both for all FAA assisted projects and programs where acquisition or relocation is required or contemplated, and for projects to reimburse the sponsor for prior acquisition or relocation. The cost incurred by the sponsor to meet the requirements of 49 CFR part 24 is allowable. Examples include, but are not limited to: **(1)** Moving expenses. **(2)** Reestablishment expenses. **(3)** Replacement housing payments. **(4)** Related non-residential expenses. **(5)** Rent supplements. **(6)** Down payments. **(7)** Mortgage interest differentials or mortgage buy downs. **(8)** Incidental expenses in connection with the acquisition of replacement housing. **(9)** Advisory services. **(10)** Preparation of feasibility studies and relocation plans.
f. Appraisal (Highest and Best Use) for Acquisition of an Airport not in the NPIAS	The acquisition of a private airport by a public sponsor will normally include acquiring all of the airport property, including improvements. The appraised highest and best use of the land may either be continued airport use, or market development of the land to a more valuable land use, but not a mix of the two. The ADO must contact APP-400 for additional guidance on the appraisal requirements for the acquisition of a private owned airport.
g. Facilities on AIP Acquired Land	When land is acquired using AIP funding and there are existing facilities on the land, the ADO must determine if the cost for these facilities is allowable. Table 3-49 provides the allowability requirements the ADO must use to make these allowability determinations.

Table 3-49 Allowability of Costs for Facilities on AIP Acquired Land

If the facility will be …	Then the cost of acquiring the facility is…
a. Demolished	**Allowable.**
b. Used for an AIP eligible purpose (such as a general aviation terminal)	**Allowable** up to the justified size or use of the AIP eligible purpose (all other project and project related funding requirements apply).
c. Demolished at a later date (not to exceed three years)	**Allowable.** The sponsor may use the structure for any incidental purposes it deems desirable provided it does not interfere with the purpose of the airport. However, any revenue at fair rental value received during the period between acquisition and demolition of the structure constitutes airport revenue and is to be used according to grant assurances. If a decision is ultimately made not to demolish the structure, then the ADO must contact ACO-100 to determine the next course of action.
d. Used for a purpose that is not AIP eligible (such as administrative offices)	**Not Allowable.**
e. Relocated from its present site	**Partially Allowable.** This cost is only allowable up to the lesser of the relocation costs or the demolition costs.

3-82. Legal Fees and Settlement Costs.

Legal fees and settlement costs are allowable if the ADO has determined that all of the criteria in Table 3-50 have been met. The ADO has the option to request the assistance of their regional legal counsel in making these determinations. The ADO also has the option to request the assistance of APP-400 for environmental or land related legal fees and settlement costs.

The ADO cannot find associated administrative expenses or consultant fees to be allowable if the ADO has determined that the legal fees or settlement costs are unallowable.

The ADO has the option to either implicitly concur with the legal fees and/or settlement costs by issuing the grant or make a written determination. In either case, the ADO must place the documentation used to support this determination in the grant file.

Table 3-50 Requirements for Legal Fees and Settlement Costs

All of the following criteria must be met for the costs to be allowable…
a. The legal fees and/or settlement costs are a necessary part of the project or are needed to avoid shutdown of the project. Examples include legal costs to file the title at the courthouse, legal costs to review contracts before they are signed by the sponsor, and settlement costs required by a court finding to avoid a project being shut down.
b. The costs are not associated with defending a specification or Federal provisions. This is because the cost to defend a Federal provisions or specification is not a necessary part of the project and is not needed to avoid shutdown of the project.
c. The costs are reasonable.
d. The costs are documented in an invoice.
e. The costs can be paid for within the existing grant (or any proposed amendment). A separate grant cannot be issued if the costs are more than the amendment limit.
f. If the total legal fees and/or settlement costs within the grant (and any proposed amendments) will exceed $100,000, the ADO has provided their recommendation up through the regional office and APP-500 to APP-1, and APP-1 has provided written concurrence.
g. The ADO has determined that costs are not due to negligence on the part of the sponsor or consultant (including bidding defective plans or improper payments) and the sponsor did not violate contract provisions.
h. The ADO has determined that the costs are not associated with the recoveries of improper payments. Under 49 USC § 47110(b)(1), all costs paid with AIP funds must be *necessary* to carry out the project. It is the sponsor's responsibility to recover improper payments without using AIP funding to carry out the work effort.
i. The sponsor has exhausted all other avenues available to pay for the costs or resolve the issue.

3-83. Lighted X's and Other Runway Closure Markings Costs.

The cost for a contractor to furnish runway closure markings during a project is an allowable cost. However, a sponsor *cannot* require the contractor to purchase lighted X's and then turn it over to the airport as part of the project. If a sponsor would like to acquire a lighted X, they must request this as a separate AIP project and justify the need to the ADO (see Appendix J).

3-84. Nonroad Diesel Engines.

In 2004, EPA issued a final rule adopting Tier 4 emission standards for nonroad diesel engines. The Tier 4 standards (40 CFR part 1039), are intended to reduce harmful emissions and to improve air quality. The EPA required all manufacturers to be fully compliant with the first model year after December 31, 2014. The standards include a hardship provision (40 CFR part 1039.635) that would delay compliance with Tier 4 emission standards for up to

two model years from the 2014 date for small-volume manufacturers (40 CFR part 1068.250). What this means is that in certain cases, a manufacturer may provide a Tier 3 engine in a Tier 4 proposal.

A sponsor has the option to bid only the Tier 4 standards for nonroad diesel engines, which will only allow Tier 4 engines to be bid, or to allow the Tier 4 hardship program engines, which will allow Tier 3 or Tier 4 engines.

3-85. Normally Unallowable Costs that are Necessary to Carry Out the Project.

The ADO has the option of finding a normally unallowable cost allowable if the associated project cannot proceed without it. However, the ADO also has the option to require the sponsor to pay for these costs. Examples of these types of costs are included in Table 3-51. If no precedent for these costs exists, the ADO must consult APP-500.

Table 3-51 Examples of Unallowable Costs Necessary to Carry Out a Project

Some examples include…
a. Planting trees that are required as an environmental mitigation measure in an FAA approved environmental finding. Landscaping is normally an unallowable cost, but in this case it would be allowable.
b. Fire hydrant installation required to obtain a local building permit for an apron project. Otherwise, fire hydrants are not a necessary for an apron project and would not be allowable.

3-86. Project Formulation Costs.

Project formulation costs must be directly related to the project. These are costs that are normally incurred before the project starts and would not have been incurred otherwise. Table 3-52 contains some examples of project formulation costs.

Indirect costs for project formulation must not be approved except as allowed in Paragraph 3-61.

Table 3-52 Examples of Project Formulation Costs

Some examples include…
a. Field surveys
b. Soil borings
c. Plans and specifications (if not a stand-alone design grant)
d. Project related airport layout plan revisions

Table 3-52 Examples of Project Formulation Costs

Some examples include…
e. Land acquisition
f. Aeronautical studies
g. Grant administrative expenses for the projects in the grant
h. Benefit-cost analyses
i. Safety risk management (SRM) analysis for the specific project
j. Environmental studies (if not a stand-alone environmental study grant)
k. Land appraisals and review appraisals, title examination, and relocation plans
l. Construction and equipment procurement costs such as bid advertisement
m. Disadvantaged Business Enterprise (DBE) plan updates and project specific DBE goal formulation

3-87. Reimbursable Agreements with Other Federal Agencies.

The cost for reimbursable agreements between the sponsor and a Federal agency is allowable if the cost is necessary for the project and the other Federal agencies statutes allow this action. For instance, 49 USC § 106(l)(6) allows the FAA to enter into reimbursable agreements in order to carry out the functions of the FAA. An example of this is a reimbursable agreement between a sponsor and the FAA Air Traffic Organization (ATO) for the purpose of having the ATO relocate an FAA-owned navigational aid that is required by an AIP funded project (as allowed under 49 USC § 44502(a)(2)).

3-88. Safety Management System (SMS) and Safety Risk Management (SRM) Costs.

An SMS manual and implementation plan covers a wide range of projects and operations at a specific airport. The requirements an ADO must follow to issue a grant for an SMS manual and implementation plan are contained in Appendix E.

In addition, the sponsor may be required to participate in an SRM panel for specific projects or operations. If the specific project is one that will be funded by AIP, then certain costs are potentially allowable per Table 3-53.

Table 3-53 Allowable SRM Costs

The following are allowable SRM costs…
a. SRM Panel Costs. SRM panel costs are only allowable if they are specifically for the project in the grant and are required and conducted per the current version of FAA Order 5200.11, FAA Airports (ARP) Safety Management System. Allowable costs are limited to the reasonable costs of a consultant to support the SRM, including the costs to obtain a third party facilitator, prepare presentations, and provide meeting notes. The costs for airport employees, tenants, or FAA employees are not allowable.
b. SRM Project Costs. The recommendations from an SRM panel are not automatically eligible or justified. The reason is that many SRM panel recommendations will be operational or involve work that is funded under another Federal program. The ADO must review these recommendations on a case by case basis to determine if the recommendation is a project or project cost that meets the eligibility and justification requirements outlined in this Handbook. The ADO may determine that the recommendation is either a stand-alone project or is an allowable cost under another eligible and justified project.

3-89. Secondary Electrical Power Supply Costs.

The primary electrical power supply is an allowable cost for any eligible project as outlined in Paragraph 3-97. In *extremely* limited circumstances the ADO also has the option to find the cost for a secondary, or redundant, power supply allowable.

The ADO may find a secondary power supply allowable if the primary power supply for the eligible areas/facilities of the airport is extremely unreliable due to any of the reasons listed in Table 3-54.

The secondary power supply must be in the form of an electrical service provided by a power company. Generators are not considered secondary electrical power supplies under this paragraph. (Generators are discussed in Appendix M.)

Table 3-54 Reasons for an ADO to find a Primary Power Supply Extremely Unreliable

Reasons include…
a. An extensive, documented, history of cable cuts.
b. Extraordinary meteorological conditions.
c. An extensive, documented, record of commercial utility interruptions.

3-90. Seismic Standards.

On June 14, 1993, the DOT published a final rule, 49 CFR part 41 implementing the provisions of Executive Order 12699, Seismic Safety of Federal and Federally-Assisted or Regulated New Building Construction, effective July 14, 1993. The result of the final rule is that that any building constructed with AIP funds must be designed and constructed in accordance with seismic standards of 49 CFR § 41.120. Therefore, the costs to include required seismic standards in an AIP project are allowable.

3-91. Site Preparation Costs for Ineligible Work.

a. Prorating Ineligible Site Preparation Costs. In some cases, a sponsor may determine that it is beneficial to undertake site preparation for both eligible and ineligible development through one construction contract. The sponsor cannot include this ineligible site preparation work unless the sponsor has obtained approval from the ADO in advance (see Paragraph 3-39 for the rules regarding ADO approval of contracts containing ineligible costs).

b. Funding Incidental Site Preparation Costs. There is only one situation where site preparation for ineligible facilities is allowable. This situation is when clearing, grading, grubbing, or related work for an eligible AIP project inadvertently overlaps the site preparation area for an ineligible facility. Examples are included in Table 3-55.

Table 3-55 Allowability Examples of Site Preparation for Ineligible Facilities

For the following situation…	The extra site preparation costs are…
a. A project to improve a runway safety area overlaps the grading work needed for an FAA-owned approach lighting system.	**Allowable.** This is because the sites overlap.
b. A project to build an eligible apron is adjacent to the proposed site for an exclusive use maintenance facility. The sponsor has requested minor site preparation for the maintenance facility be included in the apron project.	**Not allowable.** The sites do not overlap.

3-92. Spare Part Costs.

FAA policy allows sponsors to acquire spare parts in very limited circumstances. The cost for spare part is allowable if the criteria in Table 3-56 can be met.

Table 3-56 Spare Part Requirements

All of the following criteria must be met…	
a.	The spare parts are for eligible airport visual aids listed in the current version of Advisory Circular 150/5340-26, Maintenance of Airport Visual Aid Facilities.
b.	The spare parts are included in the same grant that installs the airport visual aid.
c.	The cost of the spare parts does not exceed 10% of the total cost of the airport visual aid.
d.	The total cost for the spare parts does not exceed $10,000.
e.	The spare parts are minor components of the airport visual aid.
f.	The sponsor can replace the spare parts using their own staff.
g.	The ADO believes the sponsor will be able to store or accurately account for the spare parts inventory.

3-93. Sponsor Furnished Materials or Supplies.

The sponsor requirements for using sponsor furnished materials or supplies within an AIP funded project are contained in Paragraph U-3.

The ADOs ability to concur with the use of sponsor furnished materials or supplies and use AIP funding on these items (and/or associated installation) depends on whether the material or supplies have been procured per 2 CFR §§ 200.317-200.326 (see Appendix U) and meet all of the requirements shown in Table 3-57. The ADO has the option of relying on the sponsor's written statement regarding the sponsor's ability to meet these requirements. The ADO also has the option of requiring the sponsor to provide additional support documentation.

The ADO must provide a copy of the written determination (including the approval of force account work, if applicable) to the sponsor and place a copy in the grant file. As discussed in Paragraph 4-12, per 2 CFR § 200.434 (Paragraph 12 in Attachment B of OMB Circular A-87, Cost Principles for State, Local, and Indian Tribal Governments), sponsors are prohibited from using sponsor furnished materials or supplies against the sponsor's share of a grant, unless approved as part of force account work.

Table 3-57 Rules for Sponsor Furnished Materials or Supplies

If the sponsor furnished materials or supplies…	The following can be funded with AIP…	Examples that potentially meet these requirements include…
a. Meets all of the following: **(1)** Meets the procurement requirements of 2 CFR §§ 200.317-200.326. **(2)** Meets all required Federal contract provisions for equipment procurement, including Buy American. **(3)** Meets all applicable FAA technical standards for material or supply. **(4)** Is approved by the ADO for force account work (see Paragraph 3-53).	The materials or supplies and the associated installation, testing and inspection of the equipment are AIP eligible (provided all AIP requirements are met).	ALCMS modifications. Certified airfield lighting equipment with only one manufacturer.
b. *Only* meets the applicable FAA technical standards for material or supply.	Installation, testing, and inspection only (the cost of the materials or supplies is not eligible).	Sponsor preferred airfield lighting equipment. Sponsor preferred access control cameras.
c. *Does not* meet all applicable FAA technical standards for material or supply.	Neither the materials or supplies nor the associated installation testing, and inspection (all ineligible). In addition the materials may not be used on the project.	Materials or supplies with unapproved modifications to FAA standards.
d. Are prohibited from Federal funding (even if it meets FAA technical standards).	The equipment, installation testing, and inspection (and any other associated cost) are not eligible. Installation of cans and conduit are allowable as part of an AIP funded pavement project only if the ADO has determined that they will reduce the need to disturb the AIP funded pavement at a later date.	Certified airfield light emitting diode (LED) lighting equipment that is prohibited from AIP funding.

3-94. Temporary Construction Costs.

If the ADO makes a determination that uninterrupted operation of the airport is necessary and that such operation could not be continued without temporary construction, costs of temporary construction are allowable even though a portion of the work cannot be salvaged. The costs of the temporary construction must be determined by the ADO to be both necessary and reasonable. Costs that are unreasonable are not allowable and the ADO has the option of requiring the sponsor to use lesser cost alternatives if these alternatives meet the project need. In general, temporary construction that includes new airfield pavement such as a temporary visual runway or a runway extension is unallowable without extraordinary and significant justification. The ADO must coordinate with, and obtain APP-400 and APP-500 approval, to include new airfield pavements as temporary construction measures.

Examples of allowable temporary construction are included in Table 3-58.

Temporary construction often results in pavement, facilities, or NAVAIDs that may have value to the airport once the construction is complete. The ADO has the option to concur with a sponsor's request to keep the temporary improvement in place (or relocate it to another location on the airport). However, relocation, rehabilitation, maintenance, and/or replacement of the improvement is not automatically justified for AIP funding unless the improvement would have been eligible and justified as a stand-alone project.

For items that have salvage value, such as NAVAIDs, the sponsor must follow the disposal requirements outlined in Paragraph 5-67. In addition, the ADO has the option of requiring the sponsor (normally through a special condition in the grant agreement) to transfer the item to an airport that is eligible for the item. The automated AIP system contains the current available special conditions.

Table 3-58 Examples of Allowable Temporary Construction

Some examples include…	
a.	Temporary measures required to protect air and water quality.
b.	The acquisition and installation of interim non-Federal NAVAIDs if the ADO determines they are necessary to provide visual or instrument capability during an extended period of time during the construction of the AIP project.
c.	The acquisition and installation of interim Federal NAVAIDs if the FAA Air Traffic Organization (ATO) determines they are necessary to provide visual or instrument capability during an extended period of time during the construction of the AIP project. These costs are normally included in the reimbursable agreement between the ATO and the sponsor.
d.	Construction of a haul road to avoid runway and/or taxiway crossings.

Table 3-58 Examples of Allowable Temporary Construction

Some examples include…	
e.	Measures to designate a taxiway as temporary runway in accordance with the current version of FAA Order 7110.19, Designation Taxiways as Temporary Runways.
f.	An interim terminal facility if there is no other reasonable way to accomplish the project. The interim facilities must be only that necessary to keep the operations in motion. The facilities must only be built for this interim use. Costs to develop the facility into a follow on use are not allowable.

3-95. Thermoplastic Markings.

The FAA standard specifications allow a sponsor to select and use thermoplastic markings instead of paint for airfield markings. However, as of the publication date of this Handbook, thermoplastic materials cost more than paint, both on a first cost and a life cycle cost basis (based on a life cycle for paint of approximately 3 years and thermoplastic markings of up to 7 years). In order to determine that the use of thermoplastic markings meet the statutory requirement for reasonable costs, the sponsor must provide a life cycle cost comparison that demonstrates that the costs are reasonable and verification that there are more than one manufacturer of thermoplastic markings. The ADO must retain a copy of the sponsor's successful life cycle cost analysis in the grant file.

3-96. Used Equipment Costs.

The acquisition of used equipment is allowable provided it meets FAA specifications and has an acceptable useful life based on the proposed purchase price.

The GSAXcess program is an excellent source for free used equipment. The GSAXcess website and the current version of Advisory Circular 150/5150-2, Federal Surplus Personal Property for Public Airport Purposes, are good resources for a sponsor to learn more about this program.

3-97. Utility Costs.

The installation, improvement, reconstruction, or repair of water, gas, and electric (primary power supply only) is allowable to the extent the work serves eligible areas and facilities and the utility is an allowable cost for the facility. For instance, gas, water, and electric are needed for a terminal building, whereas only electric is needed for a general aviation aircraft storage hangar.

If the utility installation will serve both eligible and ineligible areas/facilities, the allowable cost is limited to prorated share for the eligible portion. The ADO will determine the method of proration. Table 3-59 contains an example of prorated utility costs. If the utility work is required for the AIP portion of the airport, as well as for other non-AIP portions of the airport, the ADO can presume that the determination of the best interest of the Federal government required in Paragraph 3-39 has been met. However, the other requirements for including ineligible or non-AIP funded work in the contract in Paragraph 3-39 must be met.

Per FAA policy, utility projects are not eligible as stand-alone projects.

Table 3-59 Utility Costs Proration Example

For the following situation…	The allowable prorated amount would be…
A project to run electrical lines to a T-Hangar area also contains an ineligible office building. The T-Hangars are estimated to use 2/3 of the electrical load and the ineligible office building will use the remainder.	Two thirds of the total cost of the electrical line installation (including associated design, inspection, etc.).

3-98. Value Engineering.

The cost for value engineering is allowable if all of the sponsor requirements in Paragraph U-10 and the ADO requirements in Paragraph 3-54 are met.

Section 12. Costs Necessary (Allowable Cost Rule #1).

3-99. Requirements for Costs to be Necessary.

Per 49 USC § 47110(b)(1), the ADO must only approve costs that are directly necessary to accomplish the project. All other costs are considered unallowable.

Section 13. Costs Incurred after Grant Executed (Allowable Cost Rule #2).

3-100. Rules for Reimbursing Project Costs Prior to the Grant (or LOI) Execution Date.

Unless specifically allowed in the Act, 49 USC § 47110(b)(2) requires that all project costs must be incurred after the grant execution date. Table 3-60 list the entire set of rules regarding when project costs can be incurred in relationship to the grant execution date, the type of funding, and the type of project.

Table 3-60 Rules for Reimbursing Project Costs Prior to the Grant Execution Date

For…	The following rules apply…
a. Allowable costs using any or all of the following types of funds: • Passenger Entitlement • Cargo Entitlement • Nonprimary Entitlements	Per 49 USC § 47110(b)(2)(C), project costs must have been incurred after 9/30/1996. All allowable costs after this date may be reimbursed with these types of funds, regardless of whether they were incurred before the grant was executed as long as all other applicable AIP requirements have been met.

b. Allowable costs using any or all of the following types of funds: • Discretionary • State Apportionment (including Insular) • Alaska Supplemental	Per 49 USC § 47110(b)(2)(A), project costs must have been incurred after the grant execution date. The only exception for these three types of funding are (these exceptions are statutory and are the only exceptions allowed): **(1) 14 CFR part 150 Projects.** Per 49 USC § 47110(b)(2)(B), if the project is specifically contained in an FAA approved 14 CFR part 150 program (including schools and medical buildings), all of the project costs can be reimbursed. If a school or medical building is being mitigated outside an FAA approved 14 CFR part 150 program, it cannot be reimbursed. **(2) Project Formulation (Development Projects).** Per 49 USC § 47110(c), project formulation costs must be directly related to the project. These are costs that are normally incurred before the project starts and would not have been incurred otherwise. Examples of allowable project formulation costs are included in Paragraph 3-86. Per FAA policy, only land acquisition may be reimbursed under a stand-alone grant. **(3) Project Formulation (Planning Projects).** Per 49 USC § 47110(c), costs necessary and directly incurred in developing the work scope of a planning project can be reimbursed. **(4) Land Acquisition. Per 49 USC § 47110(c),** land acquisition is considered a project formulation cost and can therefore be reimbursed with all types of funding. The sponsor must have purchased the land after May 13, 1946. Per FAA policy, land acquisition may be reimbursed under a stand-alone grant for land acquisition. **(5) Letters of Intent.** Per 49 USC § 47110(e), all costs incurred after the LOI execution date, and only project formulation costs incurred before the LOI execution date, may also be reimbursed with any type of funding. **(6) Design-Build Projects.** The FAA believes that under 49 USC § 47142(b), the design and construction costs may be reimbursed with these types of funds if this contracting method is approved in advance by the ADO and all other applicable AIP requirements have been met. ADO approval is not a commitment of funds. Approval in advance by the ADO does not guarantee that the project will be considered or given priority for discretionary by the ADO. Therefore, the sponsor must have an alternative funding source available to fund the project without discretionary funding. **(7) Certain MAP Projects.** Per 49 USC § 47118(f)(2), the FAA has the option to use discretionary to reimburse approved MAP projects if the sponsor incurred the costs during fiscal years 2003 and 2004. **(8) Climate-Related Conditions.** In very limited circumstances, 49 USC § 47110(b)(2)(D) provides the FAA with the option to allow reimbursement for a project if the project meets all of the conditions in Table 3-61 through Table 3-66.

Table 3-61 Sponsor Assumption of Risk

The sponsor acknowledges that it assumes all risk by…
Sponsor Assumes All Risk. The sponsor must include a statement in the request for FAA acknowledgement of its request to be considered for reimbursement that includes the following sponsor assumption of risk: *"Because the FAA cannot guarantee the availability of any types of AIP funding on the project, the sponsor must be prepared to complete the project using other sources of funds even if the sponsor meets all of the requirements for discretionary reimbursement. There are no circumstances under which the sponsor can infer that the project will be funded with discretionary funds."*

Table 3-62 Legislative Requirements that Must be Met for FAA to Consider Reimbursement Based on Climate-Related Conditions

The ADO has determined that the sponsor has met all of the following legislative requirements…
a. Per 49 USC § 47110(b)(2)(D), construction of the project must have started in the same fiscal year as execution of the grant agreement. A construction project for which construction started in a prior fiscal year cannot be reimbursed with discretionary funding.
b. Per 49 USC § 47110(b)(2)(D)(i), the airport must be in an area that experiences a shortened construction season due to climatic conditions, which the FAA has determined to mean cold weather. To make this determination, the FAA reviewed reports from the American Association of State Highway and Transportation Officials (AASHTO) and the Federal Highway Administration on construction impacts due to weather and found that shortened construction season was understood to be related to work such as earthwork that is shut down or suspended during the winter cold weather.
c. Per 49 USC § 47110(b)(2)(D)(ii), all other applicable AIP requirements have been met.
d. Per 49 USC § 47110(b)(2)(D)(iii), the sponsor must notify the Airports District Office or regional office (ADO) in advance of starting the work of the sponsor's intent to request discretionary funding for this project. The sponsor must complete FAA Form 5100-142, Sponsor Request for FAA Acknowledgement for Cold Weather Early Start, at least 30 calendar days prior to issuing a Notice to Proceed. The ADO must forward the sponsor's request to APP-500 for processing.
e. Per 49 USC § 47110(b)(2)(D)(iv), the sponsor must have an alternative funding source available to fund the project. Because the sponsor has agreed to fully fund the complete project if AIP discretionary funding is not provided, the sponsor's alternative funding plan may include AIP future year entitlement funding or Passenger Facility Charge funding. If the sponsor's alternative funding plan does include future AIP entitlement funding which then impacts other future project requests, the sponsor will need to consider other options of funding those future projects.
f. Per 49 USC § 47110(b)(2)(D)(v), the sponsor's decision to proceed with the project in advance of execution of the grant agreement does not raise the priority assigned to the project by the FAA.

Table 3-62 Legislative Requirements that Must be Met for FAA to Consider Reimbursement Based on Climate-Related Conditions

The ADO has determined that the sponsor has met all of the following legislative requirements…
g. Per 49 USC § 47120, the FAA will give lower priority to discretionary project requests if the sponsor is using its entitlement funds for projects that have a lower priority than the projects for which discretionary funds are being requested. Therefore, this cold weather provision cannot be requested in a year when the sponsor is using its entitlement funds on a lower priority project.

Table 3-63 Implementation Requirements that Must be Met for FAA to Consider Reimbursement Based on Climate-Related Conditions

The requirements that APP-500 will consider are…
a. **The request is not due to short-term disruptions.** Short-term disruptions that prevent construction from occurring, including but not limited to rain, wind, tropical weather, fog, snowfall, ice, or high temperatures do not satisfy the requirement of a shortened construction season due to climatic conditions. This is because construction project specifications, including the FAA standard specifications, include provisions for inclement weather and temporary shutdowns.
b. **The request is not due to operational considerations.** Operational or coordination considerations, such as the desire to reopen before winter, to allow planned construction sequencing, or to meet a particular aeronautical chart publication date do not satisfy the requirement of a shortened construction season due to climatic conditions.
c. **The request is for a project that may be impacted.** The FAA has generally identified paving projects or pavement rehabilitation projects as those that are most likely to be impacted by a shortened construction season due to climatic conditions. In reviewing the request, APP-500 will consider the type of construction included in the project, the duration of the construction activities that may be impacted by a shortened construction season and the date by when the sponsor indicates that construction must begin to avoid impacts of a shortened construction season.
d. **The airport is in an impacted area.** Generally, the APP-500 will consider issuing an acknowledgement if there is at least one month in the average calendar year with an average high temperature below 40 degrees Fahrenheit and specific construction activities required for the project would be impacted by the cold temperatures.
e. **An early start may be justified.** The sponsor has demonstrated that the project requires an early start in order to fit the construction schedule into the construction season by providing the length of the construction project, date by which construction must begin in order to avoid being negatively impacted by cold weather conditions. **(1)** For example, this provision would not likely be justified for a 90-day paving project where the ADO anticipates that a grant could be issued in May. **(2)** The ADO may determine that this provision is justified for a 180-day paving project and grants are not expected to be able to be issued until July.

Table 3-64 Alternative Funding Requirements that Must be Met for FAA to Consider Reimbursement Based on Climate-Related Conditions

The sponsor's alternative funding plan includes…
a. The sponsor may include future year entitlements in the alternative funding plan. However, if the sponsor's Capital Improvement Program (CIP) previously identified projects that the sponsor planned to fund with those entitlements, the sponsor must revise their CIP accordingly.
b. If the sponsor proposes using future year entitlements, in those future years, the requested reimbursement may impact the sponsor's ability to fund other projects that year with discretionary funds, based on the requirement to fund the highest priority projects first with the sponsor's entitlement funds.
c. If the sponsor has started construction and discretionary funding is not provided in the year in which the construction started, the project is ineligible for discretionary funding in this, or future years.
d. For phased projects, these requirements must be applied individually to each phase or grant request. Funding of one phase of a phased project does not establish eligibility for funding either prior or subsequent phases.

Table 3-65 Request Requirements that Must be Met for FAA Consideration of Reimbursement Based on Climate-Related Conditions

The requirements are…
a. The sponsor must submit the written request to the ADO before contract award and before issuing Notice to Proceed to the selected contractor.
b. The sponsor must allow at least 30 calendar days following the submittal of a complete and accurate submittal to the ADO to receive a determination from APP-500.
c. Upon receipt of a sponsor's request for consideration, the ADO must review the request for completeness. If the request is incomplete, the ADO must return the request to the sponsor for correction. If the request is complete, the ADO must forward the request to APP-500. The ADO must submit the completed sponsor request, with ADO Staff Recommendation to APP-500 within nine business days of receiving the sponsor request.

Table 3-66 APP-500 Acknowledgement Process for Requests for Reimbursement Based on Climate-Related Conditions

The requirements are…
a. APP-500 will notify the ADO whether or not the proposed project can be considered for reimbursement based on climate related conditions.

Table 3-66 APP-500 Acknowledgement Process for Requests for Reimbursement Based on Climate-Related Conditions

The requirements are…
b. After APP-500 notifies the ADO whether or not the proposed project can be considered under this limited exception, the ADO must advise the sponsor of the determination. The ADO notification to the sponsor may be in writing or by e-mail. The determination is *solely* a determination as to whether the sponsor has met the necessary requirements for the FAA to be able to consider AIP discretionary funding subsequent to contract award or NTP, and does not in any way represent an actual commitment of discretionary funds.
c. APP-500 will attempt to respond to a sponsor's request within 30 days after receipt of the request. However, only actual receipt by a sponsor of an APP-500 determination that the project will be acknowledged by the FAA as having been requested for consideration for discretionary funding for a Cold Weather Construction Project constitutes FAA acknowledgement. The sponsor cannot consider lack of a response within 30 days is the equivalent of APP-500 acknowledgement.

Section 14. Costs Reasonable (Allowable Cost Rule #3).

3-101. Sponsor Requirements.

Per 2 CFR § 200.323(a), sponsors must perform a cost or price analysis in connection with every procurement action in excess of the Simplified Acquisition Threshold (provided in Table U-7). However, the ADO must determine that costs are reasonable to comply with 49 USC § 47110(b)(3). Therefore, all noncompetitive procurement actions (including change orders, supplemental agreements, and contract modifications) require a cost or price analysis regardless of cost. Table 3-67 lists the type of analysis that the sponsor must perform and the documents the sponsor must submit for various procurement scenarios. Paragraph U-21 contains guidance to sponsors on how to perform price and cost analyses. The requirements for change orders, supplemental agreements, and contract modifications are contained in Paragraph 5-35.

Table 3-67 Sponsor Requirements for Cost Reasonableness

For the following…	The sponsor must perform a…	And the sponsor must submit all of the following…
a. Land and easement acquisition	Cost Analysis	**(1)** Appraisals and review appraisals. **(2)** A statement signed by the sponsor that the cost analysis was performed that includes the sponsor's recommendation that the FAA accept the statement and analysis as evidence of cost reasonableness. **(3)** Negotiated agreements amount. **(4)** Copy of the signed negotiated agreement only if requested by the ADO. **(5)** Any other support documentation requested by the ADO.
b. Equipment acquisition and construction where there is adequate competition (two or more bidders by sealed bids)	Price Analysis (if the cost is in excess of the Simplified Acquisition Threshold (provided in Table U-7))	**(1)** Engineer's estimate. **(2)** A written statement signed by the sponsor that the cost is reasonable. If a price analysis is required, the sponsor must include in this statement that a price analysis was performed. **(3)** Bid tabulations. **(4)** Copy of the signed contract only if requested by the ADO. **(5)** Any other support documentation requested by the ADO.
c. Equipment acquisition and construction where there is not adequate competition (one bidder, sole source, design/build, small purchase, construction manager-at-risk, etc.)	Cost Analysis	**(1)** Engineer's estimate. **(2)** A statement signed by the sponsor that the cost analysis was performed that includes the sponsor's recommendation that the FAA accept the statement and analysis as evidence of cost reasonableness. **(3)** Bid tabulation (one bidder), proposal (sole source, design/build, construction manager-at-risk), or winning quote (small purchase). **(4)** Copy of the signed contract (or full set of quotes for small purchase) only if requested by the ADO. **(5)** Any other support documentation requested by the ADO.

Table 3-67 Sponsor Requirements for Cost Reasonableness

For the following…	The sponsor must perform a…	And the sponsor must submit all of the following…
d. Negotiated professional services (such as consultant costs or contract modifications to a professional services contract)	Cost Analysis	**(1)** Independent fee estimate. **(2)** A statement signed by the sponsor that the cost analysis was performed that includes the sponsor's recommendation that the FAA accept the statement and analysis as evidence of cost reasonableness. **(3)** Amount of contract. **(4)** Copy of the signed contract only if requested by the ADO. **(5)** Any other support documentation requested by the ADO.
e. Non-negotiated services (such as newspaper advertisements and rental of facilities for a public hearing)	Price Analysis (if the cost is in excess of the Simplified Acquisition Threshold (provided in Table U-7))	**(1)** Advertised pricing. **(2)** A written statement signed by the sponsor that the cost is reasonable. If a price analysis is required, the sponsor must include in this statement that a price analysis was performed. **(3)** Quote for services (or sponsor's estimate based on advertised price). **(4)** Any other support documentation requested by the ADO.
f. Non-negotiated service based on law or regulation (such as utility work by the utility company or a reimbursable agreement with the FAA Air Traffic Organization (ATO))	Price Analysis (if the cost is in excess of the Simplified Acquisition Threshold (provided in Table U-7))	**(1)** A written statement signed by the sponsor that the cost is reasonable. If a price analysis is required, the sponsor must include in this statement that a price analysis was performed. **(2)** Quote or signed contract. **(3)** Any other support documentation requested by the ADO.
g. Sponsor force account planning, engineering or construction	Cost Analysis	**(1)** All of the documentation required in Paragraph 3-53.

3-102. ADO Review Requirements.

In order to fund a project or make payment on a grant, 49 USC § 47110(b)(3) requires a cost reasonableness determination. Per FAA policy, the ADO, not the sponsor, makes the determination that the project costs are reasonable. This reasonableness determination is not an action that is covered by sponsor certification.

In order for the ADO to make a cost reasonableness determination, the ADO must review the documents submitted by the sponsor per Paragraph 3-101.

3-103. Documentation of ADO Determination.

Table 3-68 contains the documentation requirements for ADO cost reasonableness determinations. If an ADO determines that any of the costs are unreasonable, the ADO has the option to document this in writing to the sponsor and/or the grant file, however, this documentation is not mandatory.

Table 3-68 Documentation of ADO Cost Reasonableness Determinations

For…	The ADO must document its determination by…
a. Grants not based on estimates.	If the ADO finds the documentation acceptable, the ADO may issue the grant. By issuing the grant, the ADO is documenting that they have found the costs to be reasonable. In the specific instance of a state block grant that is not based on estimates, the ADO may rely on the state's signature of the grant application as documentation that the state has found all costs to be reasonable.
b. Grants based on estimates	In the rare instance that an ADO issues a grant or part of a grant based on estimates, the ADO must make the cost reasonableness determination before the sponsor receives a grant payment for the work. In this instance, the ADO must document their cost reasonableness determination in writing and place a copy in the grant file. In the specific instance of a state block grant that is based on estimates, the ADO may rely on the state's request for a grant payment for the work as documentation that the state has found all costs to be reasonable.
c. Change Orders, Supplemental Agreements, and Contract Modifications	Following the process outlined in Paragraph 5-35.

Section 15. Costs Not in Another Federal Grant (Allowable Cost Rule #4).

3-104. Requirement for Costs to Not be in Another Federal Grant.

Per 49 USC § 47110(b)(4), the cost must not be incurred in a project for airport development or airport planning for which other Federal assistance has been granted. Per FAA policy, AIP must not be used for a project cost that has already been covered in another Federal grant. In other words, the costs must not be paid for by the Federal government more than once, and may not cause the Federal share percentage of the project to exceed the Federal share allowed in 49 USC § 47109. Note that this requirement does not prohibit another Federal agency from providing funding to a sponsor to be used for the local share if that Federal agency permits its funds to be used for local share.

Section 16. Costs within Federal Share (Allowable Cost Rule #5).

3-105. Allowable Federal Share Requirement.

Per 49 USC § 47110(b)(5), the total allowable Federal costs cannot exceed the maximum Federal cost that is in the grant agreement (except as allowed within the amendment rules per, Section 7 of Chapter 5).

Section 17. No Unreasonable Delay in Completion.

3-106. Requirement for No Unreasonable Delay in Project Completion.

Per 49 USC § 47106(a)(4), the ADO cannot issue a grant to a project if the ADO is aware of circumstances that will unreasonably delay project completion. For instance, the ADO might delay putting a project under grant if there are runway closure timing issues that have not been adequately worked out with the airlines.

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Chapter 4. What AIP funding is available?

4-1. Legislation Needed to Issue AIP Grants (Authorization/Appropriation).

49 USC § 47104(a) allows the Administrator to issue grants for airport planning and development in the United States. In order to be able to issue grants and operate the AIP grant program, the FAA normally needs both an authorization and an appropriation.

a. Authorization. The authorization is often referred to as the FAA *Bill* or *Reauthorization* and may be passed by Congress for one or more years. The authorization defines the annual funding level for AIP and gives the FAA contract authority to issue grants. The authorization updates 49 USC § 48103(a) to reflect the amount authorized for airport planning and airport development under 49 USC § 47104, airport noise compatibility planning under 49 USC § 47505(a)(2), and carrying out noise compatibility programs under 49 USC § 47504(c). At the time this Handbook was published, AIP was operating under the Consolidated Appropriations Act, 2018 (Public Law 115-141).

b. Appropriation. The appropriation is an annual budget that Congress establishes for the FAA. The appropriation allows the FAA to incur obligations and make payments for specific purposes. Congress may also use the appropriation to reduce the authorized AIP funding level from the levels set by the authorization for the current year.

4-2. Airport and Airway Trust Fund (Source of AIP).

49 USC § 48103 authorizes revenue for AIP from the Airport and Airway Trust Fund, which is commonly referred to as the Trust Fund. The Airport and Airway Revenue Act of 1970 created the Trust fund to provide a dedicated source of funding for the aviation system. 26 USC § 9502(c) (the Internal Revenue Code of 1986) authorizes funds to be made available from the Trust Fund for AIP.

The revenue sources of the Trust Fund can be found in Appendix V.

4-3. Calendar Year Used for Passenger Boardings, Entitlements, and Cargo Landed Weight.

49 USC § 47102(15) defines the time period for calculating the number of passenger boardings at an airport as *in the prior calendar year*. For example, the passenger boardings set at the beginning of FY 2014 are the passenger boardings in calendar year 2012. These passenger boardings are used to calculate passenger entitlements.

Although not defined in 49 USC § 47102(10), the time period for calculating the landed cargo weight at an airport is also *in the prior calendar year*.

4-4. Categories of AIP Funding (Including Calculations and Legislative References).

Once an authorization and an appropriation are in place, the approved AIP funding is split into defined categories and types according to formulas in the Act. A detailed summary of the AIP fund categories, fund types, and associated calculation methods in Table 4-1. Table 4-2 shows

the actual percentage of AIP funding by fund type in fiscal year 2011. The calendar year used to determine the passenger boardings, entitlements, and cargo landed weight is discussed in Paragraph 4-3.

Table 4-1 AIP Funds by Category, Type, and Calculation

Fund Type and Legislative Reference	How Calculated if less than $3,200,000,000 in AIP is Available in the Fiscal Year	How Calculated if $3,200,000,000 or More in AIP is Available in the Fiscal Year
Passenger Entitlement		
a. Passenger Entitlement 49 USC § 47114(c)(1)	Per 49 USC § 47114(c)(1)(A): $7.80 for each of the first 50,000 passenger enplanements. $5.20 for each of the next 50,000. $2.60 for each of the next 400,000. $0.65 for each of the next 500,000. $0.50 for each passenger enplanement > 1 million enplanements. Per 49 USC § 47114(c)(1)(B), the annual minimum is $650,000 and the annual maximum is $22 million per airport. Per 49 USC § 47114(f), the amount of entitlement funds for large and medium hub airports collecting a PFC are reduced based on the PFC collection level approved for the airport. If the airport is collecting at $3.00 or less, the amount of entitlements is reduced by 50%. If the airport is collecting more than $3.00, the amount of entitlements is reduced by 75%. In Hawaii, this calculation is modified based on the percent of inter-island passengers. **Special Rule for Fiscal Year 2012 and 2013:** Per 49 USC § 47114(c)(1)(F), an airport that was a primary airport in 2007, but in calendar year 2009 and/or 2010, the annual number of passenger boardings	Per 49 USC § 47114(c)(1)(C): $15.60 for each of the first 50,000 passenger enplanements. $10.40 for each of the next 50,000. $5.20 for each of the next 400,000. $1.30 for each of the next 500,000. $1 for each passenger enplanement > 1 million enplanements. Per 49 USC § 47114(c)(1)(C), The annual minimum is 1 million and the annual maximum is $26 million per airport. Per 49 USC § 47114(f), the amount of entitlement funds for large and medium hub airports collecting a PFC are reduced based on the PFC collection level approved for the airport. If the airport is collecting at $3.00 or less, the amount of entitlements is reduced by 50%. If the airport is collecting more than $3.00, the amount of entitlements is reduced by 75%. In Hawaii, this calculation is modified based on the percent of inter-island passengers. **Special Rule for Fiscal Year 2012 and 2013:** Per 49 USC § 47114(c)(1)(F), an airport that was a primary airport in 2007, but in calendar year 2009 and/or 2010, the annual number of passenger boardings was less than 10,000; an amount equal to the amount apportioned for that airport in fiscal year 2009 may be apportioned during fiscal years 2012 and 2013.

Table 4-1 AIP Funds by Category, Type, and Calculation

Fund Type and Legislative Reference	How Calculated if less than $3,200,000,000 in AIP is Available in the Fiscal Year	How Calculated if $3,200,000,000 or More in AIP is Available in the Fiscal Year
	was less than 10,000; an amount equal to the amount apportioned for that airport in fiscal year 2009 may be apportioned during fiscal years 2012 and 2013.	
Cargo Entitlement		
b. Cargo Entitlement 49 USC § 47114(c)(2)	3.5% of total AIP available for grants to airports with a total annual landed weight of more than 100 million pounds of all cargo only aircraft. Each airport's cargo entitlements are calculated based on their percentage of the total landed weight (e.g., an airport with 5% of the cargo weight would receive 5% of the available cargo entitlements).. Per 49 USC § 47114(c)(2)(C), not more than 8% of the total cargo entitlements may be apportioned for any one airport.	3.5% of total AIP available for grants to airports with a total annual landed weight of more than 100 million pounds of all cargo only aircraft. Each airport's cargo entitlements are calculated based on their percentage of the total landed weight (e.g., an airport with 5% of the cargo weight would receive 5% of the available cargo entitlements).

Table 4-1 AIP Funds by Category, Type, and Calculation

Fund Type and Legislative Reference	How Calculated if less than $3,200,000,000 in AIP is Available in the Fiscal Year	How Calculated if $3,200,000,000 or More in AIP is Available in the Fiscal Year
Amounts Apportioned for General Aviation Airports Split between Nonprimary Entitlements and State Apportionment.		
c. Nonprimary Entitlement 49 USC § 47114(d)(3)(A) 49 USC § 47114(d)(7)	None. The exception is if, per 49 USC § 47114(d)(7), $650,000 for an airport that meets both of the following criteria: **(1)** Received scheduled or unscheduled air service from a large certificated air carrier (as defined in 14 CFR part 241 or such other regulations as may be issued by the Secretary under the authority of 49 USC § 41709) in the calendar year used to calculate the apportionment. **(2)** Had more than 10,000 passenger boardings in the calendar year used to calculate the apportionment.	Per 49 USC § 47114(d)(3)(A), the lesser of $150,000 or 1/5 of an airport's 5-year development cost listed in the biennial NPIAS report to Congress. The exception is if, per 49 USC § 47114(d)(7), $1,000,000 for an airport that meets both of the following criteria: **(1)** Received scheduled or unscheduled air service from a large certificated air carrier (as defined in 14 CFR part 241 or such other regulations as may be issued by the Secretary under the authority of 49 USC § 41709) in the calendar year used to calculate the apportionment. **(2)** Had more than 10,000 passenger boardings in the calendar year used to calculate the apportionment.
d. State Apportionment (including Insular) 49 USC § 47114(d)(2) 49 USC § 47114(d)(3)(B)	Per 49 USC § 47114(d)(2), 18.5% of total AIP available for grants minus the total nonprimary entitlements. Per 49 USC § 47114(d)(2), a total of 99.34% of the funds remaining after the deduction of nonprimary entitlement is apportioned for airports based on an area/population formula within the 50 States, the District of Columbia, and Puerto Rico. The remaining 0.66% is apportioned for airports in the insular areas (Guam, American Samoa, the Commonwealth of the Northern Mariana Islands, and the U.S. Virgin Islands).	Per 49 USC § 47114(d)(3), 20% of total AIP available for grants minus the total nonprimary entitlements. Per 49 USC § 47114(d)(3)(B), 99.38% of the funds remaining after the deduction of nonprimary entitlement is apportioned for airports based on an area/population formula within the 50 States, the District of Columbia, and Puerto Rico. The remaining 0.62% is apportioned for airports in the insular areas (Guam, American Samoa, the Commonwealth of the Northern Mariana Islands, and the U.S. Virgin Islands).

Table 4-1 AIP Funds by Category, Type, and Calculation

Fund Type and Legislative Reference	How Calculated if less than $3,200,000,000 in AIP is Available in the Fiscal Year	How Calculated if $3,200,000,000 or More in AIP is Available in the Fiscal Year
Alaska Supplemental		
e. Alaska Supplemental 49 USC § 47114(e)	Per 49 USC § 47114(e)(1), Alaskan airports are apportioned at least as much money as they were apportioned in fiscal year 1980 under Section 15(a)(3)(A) of the Airport and Airway Development Act of 1970. This amount is $10,672,557.	Per 49 USC § 47114(e)(4), Alaskan airports are apportioned at least double as much money as they were apportioned in fiscal year 1980 under Section 15(a)(3)(A) of the Airport and Airway Development Act of 1970. This doubled amount is $21,345,114.
Small Airport Fund This is a calculation, not a set aside fund.		
f. Small Airport Fund 49 USC § 47116	The Small Airport Fund is not an actual stand-alone set-aside fund. It is merely a calculation to ensure that a required level of discretionary is used on small airports. A total of 87.5% of the amount of passenger entitlement funds reduced from large and medium hub airports (per 49 USC § 47114(f)) is used to calculate the Small Airport Fund. The Small Airport Fund is divided by airport type as follows: 1/7 to small hub. 2/7 to general aviation and reliever airports, as well as and certain public use airports with restrictions (see Table 4-3). 4/7 to nonhub primary and non-primary commercial service.	The Small Airport Fund is not an actual stand-alone set-aside fund. It is merely a calculation to ensure that a minimum level of discretionary is used on small airports. A total of 87.5% of the amount of passenger entitlement funds reduced from large and medium hub airports (per 49 USC § 47114(f)) is used to calculate the Small Airport Fund. The Small Airport Fund is divided by airport type as follows: 1/7 to small hub. 2/7 to general aviation and reliever airports, as well as and certain public use airports with restrictions (see Table 4-3). 4/7 to nonhub primary and non-primary commercial service.

Table 4-1 AIP Funds by Category, Type, and Calculation

Fund Type and Legislative Reference	How Calculated if less than $3,200,000,000 in AIP is Available in the Fiscal Year	How Calculated if $3,200,000,000 or More in AIP is Available in the Fiscal Year
Discretionary **Includes Discretionary Set Asides and Remaining Discretionary** Remainder of AIP after above distributions.		
Discretionary Set Asides		
g. Noise and Environmental Set Aside 49 USC § 47117(e)(1)(A)	At least 35% of discretionary, but not more than $300 million.	At least 35% of discretionary, but not more than $300 million.
h. MAP Set Aside 49 USC § 47117(e)(1)(B)	At least 4% of discretionary.	At least 4% of discretionary.
i. Reliever Set Aside 49 USC § 47117(e)(1)(C)	None.	At least 0.66% (2/3 of 1%) of discretionary.
Remaining Discretionary **Includes Discretionary that Remains after Calculating the Discretionary Set Asides** 49 USC § 47115(a)		
j. Capacity/ Safety/ Security/ Noise (C/S/S/N) 49 USC § 47115(c)	75% of remainder of AIP after above distributions and set-asides, and 75% of 12.5% of the returned entitlements that are not allocated to the Small Airport Fund.	75% of remainder of AIP after above distributions and set-asides, and 75% of 12.5% of the returned entitlements that are not allocated to the Small Airport Fund.
k. Pure Discretionary 49 USC § 47115(b)	25% of remainder of AIP after above distributions and set-asides, and 25% of 12.5% of the returned entitlements that are not allocated to the Small Airport Fund.	25% of remainder of AIP after above distributions and set-asides, and 25% of 12.5% of the returned entitlements that are not allocated to the Small Airport Fund.
l. Discretionary from Converted Entitlements/ Apportionments 49 USC § 47117(f)	No calculation. This funding is obtained from carrying over entitlements and apportionments to the next year. This funding is not subject to the set aside calculation requirements.	No calculation. This funding is obtained from carrying over entitlements and apportionments to the next year. This funding is not subject to the set aside calculation requirements.

Table 4-2 Fiscal Year 2017 Final Funding Breakdown by Fund Type

Fund Type	Percentage
a. Passenger Entitlement	27.01%
b. Cargo Entitlement	3.50%
c. Nonprimary Entitlements	12.01%
d. State Apportionment	7.99%
e. Alaska Supplemental	0.67%
f. Noise and Environmental Set Aside	3.37%
g. MAP Set Aside	0.39%
h. Reliever Set Aside	0.06%
i. Small Airport Fund	16.33%
j. Capacity/ Safety/ Security/ Noise (C/S/S/N)	4.36%
k. Pure Discretionary	1.45%
l. Discretionary from Converted Entitlements/Apportionments	22.85%

4-5. Types of Potential Funding by Airport Type (Including Airport Type Definitions).

As established in 49 USC § 47104, only public-use airports in the NPIAS are eligible for AIP funding. These airports are classified into various categories as shown in Table 4-3, along with the types of potential funding that an ADO can apply to these airport types.

Table 4-3 Airport Type Criteria and Potential Funding Types

Airport Type	And meets all of the following Airport Criteria	Types of Potential Funding (See Paragraphs 4-6 and 4-7 for additional restrictions by airport and project type)
a. Large Hub	**(1) Commercial Service Airport.** Publicly owned airport that has at least 2,500 passenger boardings each calendar year and receives scheduled passenger service. (*Note: Privately owned airports are not commercial service airports per 49 USC § 47102(7) even if the airport has at least 2,500 passenger boardings.*) **(2) Primary Airport.** A commercial service airport with more than 10,000 annual passenger boardings per 49 USC § 47102(16). **(3) Meets Large Hub Criteria.** 1% or more of annual passenger boardings per 49 USC § 47102(11).	Passenger Entitlement Discretionary Alaska Supplemental Cargo Entitlement State Apportionment – Per 49 USC § 47114(d)(4), State Apportionment may be used by any size public airport in Hawaii, Alaska or Puerto Rico.
b. Medium Hub	**(1) Commercial Service Airport.** Publicly owned airport that has at least 2,500 passenger boardings each calendar year and receives scheduled passenger service. (*Note: Privately owned airports are not commercial service airports per 49 USC § 47102(7) even if the airport has at least 2,500 passenger boardings.*) **(2) Primary Airport.** A commercial service airport with more than 10,000 annual passenger boardings per 49 USC § 47102(16). **(3) Meets Medium Hub Criteria.** At least 0.25%, but less than 1% or more of annual passenger boardings per 49 USC § 47102(13).	Passenger Entitlement Discretionary Alaska Supplemental Cargo Entitlement State Apportionment – Per 49 USC § 47114(d)(4), State Apportionment may be used by any size public airport in Hawaii, Alaska or Puerto Rico.

Table 4-3 Airport Type Criteria and Potential Funding Types

Airport Type	And meets all of the following Airport Criteria	Types of Potential Funding (See Paragraphs 4-6 and 4-7 for additional restrictions by airport and project type)
c. Small Hub	**(1) Commercial Service Airport.** Publicly owned airport that has at least 2,500 passenger boardings each calendar year and receives scheduled passenger service. (*Note: Privately owned airports are not commercial service airports per 49 USC § 47102(7) even if the airport has at least 2,500 passenger boardings.*) **(2) Primary Airport.** A commercial service airport with more than 10,000 annual passenger boardings per 49 USC § 47102(16). **(3) Meets Small Hub Criteria.** At least 0.05%, but less than 0.25% or more of annual passenger boardings per 49 USC § 47102(25).	Passenger Entitlement Small Airport Fund Discretionary Alaska Supplemental Cargo Entitlement State Apportionment – Per 49 USC § 47114(d)(4), State Apportionment may be used by any size public airport in Hawaii, Alaska or Puerto Rico.
d. Nonhub Primary	**(1) Commercial Service Airport.** Publicly owned airport that has at least 2,500 passenger boardings each calendar year and receives scheduled passenger service. (*Note: Privately owned airports are not commercial service airports per 49 USC § 47102(7) even if the airport has at least 2,500 passenger boardings.*) **(2) Primary Airport.** A commercial service airport with more than 10,000 annual passenger boardings per 49 USC § 47102(16). **(3) Meets Nonhub Criteria.** More than 10,000, but less than 0.05% or more of annual passenger boardings per 49 USC § 47102(14).	Passenger Entitlement Small Airport Fund Discretionary Alaska Supplemental Cargo Entitlement State Apportionment – Per 49 USC § 47114(d)(4), State Apportionment may be used by any size public airport in Hawaii, Alaska or Puerto Rico.
e. Virtual Primary (Scenario 1) Per 49 USC § 47114 (c)(1)(E)	**(1) Primary Airport in Last Fiscal Year.** A commercial service airport with more than 10,000 passenger boardings two calendar years preceding the current fiscal year	Passenger Entitlement Small Airport Fund Discretionary (except for C/S/S/N) Alaska Supplemental Cargo Entitlement

Table 4-3 Airport Type Criteria and Potential Funding Types

Airport Type	And meets all of the following Airport Criteria	Types of Potential Funding (See Paragraphs 4-6 and 4-7 for additional restrictions by airport and project type)
	(2) Meets Nonprimary Airport Criteria in Current Fiscal Year. Less than 10,000 annual passenger boardings in the calendar year before the current fiscal year. **(3) Reason for Fall of Passenger Boardings.** APP-400 must determine that the cause of the shortfall in passenger boardings was a temporary but significant interruption in service by an air carrier to that airport due to an employment action, natural disaster, or other event unrelated to the demand for air transportation at the affected airport. **(a)** Examples of temporary but significant interruptions that have qualified for this provision: **(i)** Closure of a single-runway airport for three months for runway rehabilitation. **(ii)** FAA grounding of the air carrier serving the airport for several months. **(b)** Examples of shortfalls in passenger boardings that have not qualified for this provision: **(i)** Air carrier business decisions, such as canceling lightly-loaded flights. **(ii)** Air carrier business decision to reduce the number of seats available in the market by using smaller aircraft or removing seats from an aircraft. **(iii)** Nationwide issues such as pilot shortages or rising fuel costs. The provision is specific that the interruption is to "that" airport, which excludes issues affecting many airports.	State Apportionment – Per 49 USC § 47114(d)(4), State Apportionment may be used by any size public airport in Hawaii, Alaska or Puerto Rico. *Note: If APP-400 determines that the airport qualifies as a virtual primary, the current fiscal year passenger entitlement amount will be equal to entitlement amount in the preceding fiscal year.*

Table 4-3 Airport Type Criteria and Potential Funding Types

Airport Type	And meets all of the following Airport Criteria	Types of Potential Funding (See Paragraphs 4-6 and 4-7 for additional restrictions by airport and project type)
	(iv) The sponsor has not taken all reasonable measures to ensure that enplanements are correctly reported. **(4) Duration.** This virtual primary status is only good for one fiscal year.	
f. Virtual Primary (Scenario 2) Per Section 141(b) of the FAA Modernization and Reform Act of 2012 (Public Law 112-95)	**(1) Primary Airport in Fiscal Year 2009.** A commercial service airport with more than 10,000 passenger boardings in calendar year 2007. **(2) Meets Nonprimary Airport Criteria in Fiscal Years 2011 or 2012**. Less than 10,000 annual passenger boardings in either calendar year 2009 or 2010. **(3) Duration**. This virtual primary status is only good for fiscal years 2012 and 2013.	Passenger Entitlement Small Airport Fund Discretionary (except for C/S/S/N) Alaska Supplemental Cargo Entitlement State Apportionment – Per 49 USC § 47114(d)(4), State Apportionment may be used by any size public airport in Hawaii, Alaska or Puerto Rico. *Note: If APP-400 determines that the airport qualifies as a virtual primary, the current fiscal year passenger entitlement amount will be equal to entitlement amount in fiscal year 2009.*
g. Virtual Primary (Scenario 3) Per 49 USC § 47114 (c)(1)(F)	**(1) Primary Airport in Fiscal Year 2014.** A commercial service airport with more than 10,000 passenger boardings in calendar year 2012. **(2) Scheduled Service in Calendar Year 2015.** Had scheduled service at any point in calendar year 2015 (the year used to calculate the apportionment for fiscal year 2017). **(3) Meets Nonprimary Airport Criteria in Fiscal Year 2017**. Less than 10,000 annual passenger boardings in calendar year 2015. **(4) Duration**. This virtual primary status is only good for fiscal year 2017 and 2018, unless extended by Congress.	Passenger Entitlement Small Airport Fund Discretionary (except for C/S/S/N) Alaska Supplemental Cargo Entitlement State Apportionment – Per 49 USC § 47114(d)(4), State Apportionment may be used by any size public airport in Hawaii, Alaska or Puerto Rico. *Note: If APP-400 determines that the airport qualifies as a virtual primary, the current fiscal year passenger entitlement amount will be equal to entitlement amount in fiscal year 2009.*

Table 4-3 Airport Type Criteria and Potential Funding Types

Airport Type	And meets all of the following Airport Criteria	Types of Potential Funding (See Paragraphs 4-6 and 4-7 for additional restrictions by airport and project type)
h. Nonprimary Commercial Service (also referred to as Nonhub Nonprimary)	**(1) Commercial Service Airport.** Publicly owned airport that has at least 2,500 passenger boardings each calendar year and receives scheduled passenger service. (*Note: Privately owned airports are not commercial service airports per 49 USC § 47102(7) even if the airport has at least 2,500 passenger boardings.*) **(2) Not a Primary Airport.** Not a primary airport because the airport has less than or equal to 10,000 annual passenger boardings per 49 USC § 47102(16).	Nonprimary Entitlement State Apportionment Small Airport Fund Discretionary (except for C/S/S/N) Alaska Supplemental Cargo Entitlement
i. General Aviation	**(1) Public Airport.** Per 49 USC § 47102(8), a public airport that is located within a state. Per 49 USC § 47102(21), a public airport is an airport used or intended to be used for public purposes that is under the control of a public agency where the area used or intended to be used for the landing, taking off, or surface maneuvering of aircraft is publicly owned. **(2) Not a Commercial Service Airport.** Per 49 USC § 47102(8), the airport must either have no scheduled service, or scheduled service with less than 2,500 annual passenger boardings each year.	Nonprimary Entitlement State Apportionment Small Airport Fund Discretionary (except for C/S/S/N) Alaska Supplemental Cargo Entitlement

Table 4-3 Airport Type Criteria and Potential Funding Types

Airport Type	And meets all of the following Airport Criteria	Types of Potential Funding (See Paragraphs 4-6 and 4-7 for additional restrictions by airport and project type)
j. Reliever	**(1) Airport Designated as a Reliever by the FAA**. The criteria for the FAA to designate an airport as a reliever is as follows: **(a) Definition in Statute.** Per 49 USC § 47102(23), a reliever is an airport the Secretary designates to relieve congestion at a commercial service airport and to provide more general aviation access to the overall community **(b) How the FAA (Secretary) Designates Relievers.** Per the current version of FAA Order 5090-3, Field Formulation of the National Program of Integrated Airport Systems, reliever airports must have more than 25,000 annual itinerant operations or at least 100 based aircraft that is relieving a commercial service airport that serves a metropolitan area with a population of at least 250,000 persons or at least 250,000 annual enplaned passengers, and operates at 60% of its capacity, or would be operated at such a level before being relieved by one or more reliever airports, or is subject to restrictions that limit activity that would otherwise reach 60% of capacity.	Nonprimary Entitlement State Apportionment Small Airport Fund Discretionary Alaska Supplemental Cargo Entitlement *Note: To be eligible to receive the reliever set-aside, per 49 USC §* 471117(e)(1)(C), *the reliever airport must have more than 75,000 annual operations, a runway of greater than 5,000 feet, a precision instrument landing procedure, 100 based aircraft, and must relieve an airport with 20,000 hours of annual delays of commercial passenger aircraft operations.*

Table 4-3 Airport Type Criteria and Potential Funding Types

Airport Type	And meets all of the following Airport Criteria	Types of Potential Funding (See Paragraphs 4-6 and 4-7 for additional restrictions by airport and project type)
k. General Aviation Airport Eligible for Minimum Primary Entitlement (per 49 USC § 47114 (d)(7))	**(1) Received Large Certificated Air Carrier Service.** Per 49 USC § 47114(d)(7)(A), received scheduled or unscheduled air service from a large certificated air carrier (as defined in 14 CFR part 241, or such other regulations as may be issued by the Secretary of Transportation under the authority of 49 USC § 47109) **(2) Over 10,000 Passenger Boardings.** Had more than 10,000 passenger boardings in the calendar year used to calculate the apportionment, per 49 USC § 47114(d)(7)(B).	Nonprimary Entitlement State Apportionment Small Airport Fund Discretionary (except for C/S/S/N) Alaska Supplemental Cargo Entitlement *Note that these airports receive the amount of minimum primary entitlements, but as nonprimary entitlements.*
l. Privately-Owned, Public Use Airport meeting Statutory Limitations	**(1) Public Use Airport Meeting Statutory Limitations.** Per 49 USC § 47102(22)(B)(ii), a privately-owned airport used or intended to be used for public purposes that has at least 2,500 passenger boardings each year and receives scheduled passenger aircraft service. **(2) NPIAS Airport.** Designated by the FAA to be a NPIAS Airport.	Small Airport Fund Discretionary (except for C/S/S/N)

4-6. Airports that Can Use Each Fund Type (Funding Restrictions by Airport Type).

Table 4-4 provides a comprehensive list of airport limitations by fund type.

Table 4-4 Airports that Can Use Each Fund Type

Fund Type and Legislative Reference	Public Use NPIAS Airports that Can Use this Funding
a. Passenger Entitlement 49 USC § 47114(c)(1)	**(1)** Primary and virtual primary airports. **(2)** Airports in the Republic of the Marshall Islands, Federated States of Micronesia, and Republic of Palau are excluded per 49 USC § 47115(j).

Table 4-4 Airports that Can Use Each Fund Type

Fund Type and Legislative Reference	Public Use NPIAS Airports that Can Use this Funding
b. Cargo Entitlement 49 USC § 47114(c)(2)	**(1)** Airports that have more than 100,000,000 pounds of landed all-cargo weight annually. **(2)** Airports in the Republic of the Marshall Islands, Federated States of Micronesia, and Republic of Palau are excluded per 49 USC § 47115(j).
c. Nonprimary Entitlement 49 USC § 47114(d)(3)	**(1)** General aviation, reliever, and nonprimary commercial service airports. **(2)** Airports in the Republic of the Marshall Islands, Federated States of Micronesia, and Republic of Palau are excluded per 49 USC § 47115(j).
d. State Apportionment 49 USC § 47114(d)(2)	**(1)** General aviation, reliever, and nonprimary commercial service airports within the specific state or insular area (except for in Alaska, Hawaii and Puerto Rico, where the funds can be used on any airport type per 49 USC § 47114(d)(4)). **(2)** Primary and virtual primary airports only when the project is an integrated airport system planning project that encompasses one or more primary airports per 49 USC § 47114(d)(6). **(3)** Airports in the Republic of the Marshall Islands, Federated States of Micronesia, and Republic of Palau are excluded per 49 USC § 47115(j).
e. Alaska Supplemental 49 USC § 47114(e)	**(1)** Airports located in Alaska.
f. Small Airport Fund 49 USC § 47116	**(1)** Small hub, nonhub, virtual primary, nonprimary commercial service, and general aviation, and reliever airports, as well as and certain public use airports with restrictions (see Table 4-3). **(2)** 49 USC § 47116(c), also specifically allows an airport in block grant states to receive grants directly from the FAA with small airport funds as if the state were not within the program.
g. Discretionary: Noise and Environmental Set Aside 49 USC § 47117(e)(1)(A)	**(1)** **Airports.** Any airport eligible for one of the follow projects: **(a)** **Airport Noise Compatibility Planning.** Airport noise compatibility planning under section 49 USC § 47505(a)(2). **(b)** **Noise Compatibility Program Projects.** Airport noise compatibility program projects approved by the

Table 4-4 Airports that Can Use Each Fund Type

Fund Type and Legislative Reference	Public Use NPIAS Airports that Can Use this Funding
	FAA in a noise compatibility program under 49 USC § 47504(c). **(c) Noise Mitigation Projects in a Record of Decision.** Noise mitigation projects approved in an environmental record of decision for an airport development project. **(d) Compatible Land Use Planning/Projects.** Compatible land use planning and projects carried out by state and local governments under 49 USC § 47141. **(e) Americans with Disabilities Act of 1990 (ADA) Projects.** Airport development projects (including equipment) to comply with ADA per 49 USC § 47102(3)(F). **(f) Clean Air Act Projects.** Airport development projects (including equipment) to comply with the Clean Air Act (42 USC § 7401) per 49 USC § 47102(3)(F). **(g) Federal Water Pollution Control Act (commonly referred to as the Clean Water Act) Projects.** Airport development projects (including equipment) required to comply with the Federal Water Pollution Control Act (33 USC § 1251 et seq) per 49 USC § 47102(3)(F). In addition, water quality mitigation projects to comply with the Federal Water Pollution Control Act that are approved in an environmental record of decision for an airport development project may use this type of funding. **(h) Voluntary Airport Low Emissions (VALE) Projects.** Projects that meet the requirements of the VALE program per 49 USC § 47102(3)(K) and 49 USC § 47102(3)(L). These requirements are discussed in Section 5 of Chapter 6. **(2) Non-Airport Sponsors.** Any non-airport sponsors that is eligible for one of the follow projects: **(a) Airport Noise Compatibility Planning.** Airport noise compatibility planning under section 49 USC § 47505(a)(2). **(b) Noise Compatibility Program Projects.** Airport noise compatibility program projects approved by the FAA in a noise compatibility plan under 49 USC § 47504(c). **(c) Noise Mitigation Projects in a Record of Decision.** Noise mitigation projects approved in an

Table 4-4 Airports that Can Use Each Fund Type

Fund Type and Legislative Reference	Public Use NPIAS Airports that Can Use this Funding
	environmental record of decision for an airport development project. **(d) Compatible Land Use Planning/Projects.** Compatible land use planning and projects carried out by state and local governments under 49 USC § 47141. **(3) Sponsors and Airports Not Included**. Sponsors and airports in the Republic of the Marshall Islands, Federated States of Micronesia, and Republic of Palau are able to receive grants from the discretionary fund in 49 USC § 47115 and the Small Airport Fund in 49 USC § 47116 per 49 USC § 47115(j), which means that they are not able to receive grants from the Noise and Environmental Set Aside in 49 USC § 47117(e)(1)(A).
h. Discretionary: MAP Set Aside 49 USC § 47117(e)(1)(B)	**(1)** FAA designated Military Airport Program airports. These are former military airports closed or realigned and designated for conversion to civil or joint use. **(2)** Sponsors and airports in the Republic of the Marshall Islands, Federated States of Micronesia, and Republic of Palau are able to receive grants from the discretionary fund in 49 USC § 47115 and the Small Airport Fund in 49 USC § 47116 per 49 USC § 47115(j). **(3)** Per 49 USC § 47118(h), an FAA designated safety critical airport. **(4)** Sponsors and airports in the Republic of the Marshall Islands, Federated States of Micronesia, and Republic of Palau are able to receive grants from the discretionary fund in 49 USC § 47115 and the Small Airport Fund in 49 USC § 47116 per 49 USC § 47115(j), which means that they are not able to receive grants from the MAP Set Aside in 49 USC § 47117(e)(1)(B).

Table 4-4 Airports that Can Use Each Fund Type

Fund Type and Legislative Reference	Public Use NPIAS Airports that Can Use this Funding
i. Discretionary: Reliever Set Aside 49 USC § 47117(e)(1)(C)	**(1)** Only those reliever airports with more than 75,000 annual operations, a runway of greater than 5,000 feet, a precision instrument landing procedure, 100 based aircraft, and relieves an airport with 20,000 hours of annual delays of commercial passenger aircraft operations. **(2)** Sponsors and airports in the Republic of the Marshall Islands, Federated States of Micronesia, and Republic of Palau are able to receive grants from the discretionary fund in 49 USC § 47115 and the Small Airport Fund in 49 USC § 47116 per 49 USC § 47115(j), which means that they are not able to receive grants from the Reliever Set Aside in 49 USC § 47117(e)(1)(C).
j. Discretionary: Capacity/ Safety/ Security/ Noise (C/S/S/N) 49 USC § 47115(c)	**(1)** Only primary and reliever airports.
k. Pure Discretionary 49 USC § 47115(b)	**(1)** Any public-use NPIAS airport. **(2)** Midway Island Airport during fiscal years 2012-2018 per Section 186(d) of the Vision 100 – Century of Aviation Reauthorization Act (Public Law 108-176) as amended by Section 102 of Division M, Title I of the Consolidated Appropriations Act, 2018 (Public Law 115-141). This funding can only be issued through a reimbursable agreement between the FAA and the Secretary of the Interior and is limited to $2.5 million of pure discretionary per fiscal year.
l. Discretionary from Converted Entitlements/ Apportionments 49 USC § 47117(f)	**(1)** Any public-use NPIAS airport.

4-7. Project Restrictions by Fund Type.

Table 4-5 provides a comprehensive list of project restrictions by fund type.

Table 4-5 Project Restrictions by Fund Type

Fund Type	Project Restrictions by Fund Type
a. Passenger Entitlement	**(1) Non-Revenue Producing Public Parking Lots.** Not allowed for any airport type except a nonhub primary airport (only if associated with a commercial service terminal building) per 49 USC § 47119(a)(2) and 49 USC § 47119(c)(1). **(2) Revenue Producing Aeronautical Support Facilities.** Not allowed. (The Act does not authorize this funding for this purpose.)
b. Cargo Entitlement	**(1) Terminal Buildings.** Not allowed (see Paragraph N-11 for details). **(2) Non-Revenue Producing Public Parking Lots.** Not allowed (the Act does not authorize this funding for this purpose). **(3) Revenue Producing Aeronautical Support Facilities.** Not allowed (the Act does not authorize this funding for this purpose). **(4) Relocation of Sponsor Owned Facilities Caused by a Change in FAA Design Standards.** Not allowed (see Paragraph 3-74 for details).
c. Nonprimary Entitlement	**(1) Non-Revenue Producing Public Parking Lots.** Not allowed for any airport types except nonprimary commercial service airports (only if associated with a commercial service terminal building) or general aviation and reliever airports (only if associated with a general aviation terminal building) per 49 USC § 47119(a)(2) and 49 USC § 47119(c)(5).
d. State Apportionment	**(1) Terminal Buildings.** Not allowed (see Paragraph N-11 for details). **(2) Non-Revenue Producing Public Parking Lots.** Not allowed (the Act does not authorize this funding for this purpose). **(3) Revenue Producing Aeronautical Support Facilities.** Not allowed (the Act does not authorize this funding for this purpose).
e. Alaska Supplemental	**(1) Terminal Buildings.** Not allowed (see Paragraph N-11 for details). **(2) Non-revenue Producing Public Parking Lots.** Not allowed (the Act does not authorize this funding for this purpose). **(3) Revenue Producing Aeronautical Support Facilities.** Not allowed (the Act does not authorize this funding for this purpose). **(4) Relocation of Sponsor Owned Facilities Caused by a Change in FAA Design Standards.** Not allowed (see Paragraph 3-74 for details). **(5) Contract Air Traffic Control Towers.** Not allowed. Funding is restricted by airport and fund type per 49 USC § 47124(b)(4)(A).

Table 4-5 Project Restrictions by Fund Type

Fund Type	Project Restrictions by Fund Type
f. Small Airport Fund	**(1) Terminal Buildings.** Not allowed for any airport type other than small hub primary airports with exactly .05% of the annual passenger boardings and nonhub primary airports (see Paragraph N-11 for details). **(2) Non-Revenue Producing Public Parking Lots.** Not allowed for any airport types except nonhub primary airports (only if associated with a commercial service terminal building) per 49 USC § 47119(a)(2) and 49 USC § 47119(c)(3). **(3) Projects without Small Airport Fund Notification.** The ADO must not use these funds on any project unless the ADO notifies the sponsor in writing that the project is being funded, all or in part, by the Small Airport Fund per 49 USC § 47116(f). **(4) Revenue Producing Aeronautical Support Facilities**. Not allowed (the Act does not authorize this funding for this purpose). **(5) Relocation of Sponsor Owned Facilities Caused by a Change in FAA Design Standards.** Not allowed (see Paragraph 3-74 for details). **(6) Contract Air Traffic Control Towers.** Not allowed. Funding is restricted by airport and fund type per 49 USC § 47124(b)(4)(A).

Table 4-5 Project Restrictions by Fund Type

Fund Type	Project Restrictions by Fund Type
g. Noise and Environmental Set Aside	**(1) Projects that are not Noise, Air Quality, or Environmental.** The ADO must not use these funds on projects except eligible noise, air quality, and specific environmental projects. Energy efficiency studies and projects are **not** included (see Section 7 of Chapter 6). Per 49 USC § 47117(e)(1)(A), the eligible projects are restricted to: **(a) Airport Noise Compatibility Planning.** Airport noise compatibility planning under section 49 USC § 47505(a)(2). **(b) Noise Compatibility Program Projects**. Airport noise compatibility program projects approved by the FAA in a noise compatibility program under 49 USC § 47504(c). **(c) Noise Mitigation Projects in a Record of Decision**. Noise mitigation projects approved in an environmental record of decision for an airport development project. **(d) Compatible Land Use Planning/Projects**. Compatible land use planning and projects carried out by state and local governments under 49 USC § 47141. **(e) Americans with Disabilities Act of 1990 (ADA) Projects**. Airport development projects (including equipment) to comply with ADA per 49 USC § 47102(3)(F). **(f) Clean Air Act Projects**. Airport development (including equipment) projects to comply with the Clean Air Act (42 USC § 7401) per 49 USC § 47102(3)(F). **(g) Federal Water Pollution Control Act (commonly referred to as the Clean Water Act) Projects.** Airport development projects (including equipment) required to comply with the Federal Water Pollution Control Act (33 USC § 1251 et seq) per 49 USC § 47102(3)(F). In addition, water quality mitigation projects to comply with the Federal Water Pollution Control Act that are approved in an environmental record of decision for an airport development project may use this type of funding. **(h) Voluntary Airport Low Emissions (VALE) Projects**. Projects that meet the requirements of the VALE program per 49 USC § 47102(3)(K) and 49 USC § 47102(3)(L). These requirements are discussed in Section 5 of Chapter 6 **(i) Zero Emission Vehicle and Infrastructure Projects.** Projects that meet the requirements of this pilot program per 49 USC § 47136a(a). This is further discussed in Section 6 of Chapter 6.

Table 4-5 Project Restrictions by Fund Type

Fund Type	Project Restrictions by Fund Type
h. MAP Set Aside	**(1) Projects that are not approved under MAP or 49 USC § 47118(h).** The ADO must not use these funds on projects that are not approved under MAP (see Section 3 of Chapter 6 for details) or as an FAA designated safety critical project under 49 USC § 47118(h) (see Paragraph 2-3 for details).
i. Reliever Set Aside	**(1) Terminal Buildings.** Not allowed (see Paragraph N-11 for details). **(2) Non-Revenue Producing Public Parking Lots.** Not allowed (the Act does not authorize this funding for this purpose). **(3) Revenue Producing Aeronautical Support Facilities.** Not allowed (the Act does not authorize this funding for this purpose). **(4) Relocation of Sponsor Owned Facilities Caused by a Change in FAA Design Standards.** Not allowed (see Paragraph 3-74 for details). **(5) Contract Air Traffic Control Towers.** Not allowed. Funding is restricted by airport and fund type per 49 USC § 47124(b)(4)(A).
j. Remaining Discretionary (C/S/S/N, Pure Discretionary, and Discretionary from Converted Entitlements/ Apportionments)	**(1) Terminal Buildings.** Only allowed in limited amounts at non-hub primary airports, nonprimary commercial service airports, and reliever airports and in limited circumstances where the airport has changed airport types (see Paragraph N-11 for details). **(2) Non-Revenue Producing Public Parking Lots.** Not allowed except for nonhub primary airports, nonprimary commercial service airports, and reliever airports per 49 USC § 47119(a)(2), 49 USC § 47119(c)(2), and 49 USC § 47119(c)(3). The non-revenue producing public parking lot is only allowable if it is associated with an eligible commercial service or general aviation terminal building. The same discretionary funding rules and amounts apply for non-revenue producing public parking lots as the associated terminal (see Item 1 above that discuss discretionary rules for commercial service and general aviation terminal buildings). **(3) Revenue Producing Aeronautical Support Facilities.** Not allowed (the Act does not authorize this funding for this purpose). **(4) Relocation of Sponsor Owned Facilities Caused by a Change in FAA Design Standards.** Not allowed (see Paragraph 3-74 for details). **(5) Use on Higher Priority Projects than Entitlement Projects.** To meet the requirements of 49 USC § 47120, the ADO must obtain prior approval from APP-520 to use these funds on a project if passenger, cargo, nonprimary, state apportionment, or Alaska supplemental will be used on lower priority projects. **(6) Consideration of Project Priority.** To comply with 49 USC § 47115(d)(2)(A), the ADO, prior to selecting a project for this type of funding, must determine if the decision will impact the ability to fund other projects with a higher national priority rating in the same fiscal year and obtain regional office approval. **(7) Consideration of Project Execution.** To comply with 49 USC § 47115(d)(2)(B), the ADO must consider whether the sponsor

Table 4-5 Project Restrictions by Fund Type

Fund Type	Project Restrictions by Fund Type
	can start the project in either the current fiscal year or six months after the grant is issued, whichever is later. Per FAA policy, starting the project means issuing a notice to proceed for construction projects; executing the purchase order for equipment projects; beginning design for projects that include design; or beginning planning for planning projects. **(8) Contract Air Traffic Control Towers.** Not allowed. Funding is restricted by airport and fund type per 49 USC § 47124(b)(4)(A).

4-8. Fund Expiration Time Frames by Airport and Fund Type.

49 USC § 47117(b) defines how long AIP funding is available. Once AIP funds are apportioned, the funds are only available for the number of fiscal years listed in Table 4-6.

Table 4-6 Expiration of AIP Funds

For the following airport type…	The following funds…	Are available for the fiscal year in which the funds are apportioned plus…
a. Small, Medium, or Large Hub Primary	Passenger Entitlement Cargo Entitlement	Two fiscal years immediately following the year in which the funds are apportioned, **or a total of three years.** *These funds continue to have a three year life even if the airport type changes after the funds have been allocated.*
b. Nonhub Primary	Passenger Entitlement Cargo Entitlement	Three fiscal years immediately following the year in which the funds are apportioned, **or a total of four years.** *These funds continue to have a four year life even if the airport type changes after the funds have been allocated.*
c. Nonprimary	Cargo Entitlement Nonprimary Entitlement	Three fiscal years immediately following the year in which the funds are apportioned, **or a total of four years.** *These funds continue to have a four year life even if the airport type changes after the funds have been allocated.*
d. N/A	State Apportionment (including Insular) Alaska Supplemental	Two fiscal years immediately following the year in which the funds were apportioned, **or a total of three years.**
e. N/A	Discretionary	Zero additional years, **or a total of one year**.

4-9. Federal Share by Airport Type (Including Exceptions).

The Federal share of allowable project costs is a fixed percentage of the allowable project costs. The Federal share by airport type, as well as the associated exceptions, is listed in Table 4-7.

Table 4-7 Federal Share by Airport Type (Including Exceptions)

Airport Type	Normal Federal Share	Exceptions
a. Large Hub **b.** Medium Hub	75%	**(1) Noise Projects.** 80% for noise projects per 49 USC § 47504(c)(4). *Note: Per 49 USC § 47505(b), the normal Federal share for noise compatibility planning projects remains at 75% unless the airport receives a different Federal share in one of the other exceptions listed here. In addition, the Federal share for non-noise compatibility projects that are funded through the environmental set-aside such as VALE, noise planning projects, and other non-noise related environmental projects also remain at 75%.* **(2) States with Large Amounts of Public Land.** 49 USC § 47109(b) increases the Federal share at some airports in states with large amounts of publicly owned land. These airports and their increased Federal shares are listed in Paragraph 4-10. **(3) Insular Areas.** Airports in American Samoa, Guam, the U.S. Virgin Islands, or the Northern Mariana Islands have a waiver of up to $200,000 of the sponsor's share per 33 USC § 2310. Therefore, a grant of up to $2,000,000 at the 90% participation rate needs no contribution from the sponsor. **(4) Special Rule for Transition from Small to Medium Hub.** The Federal share for a medium hub is at 90% for the two fiscal years following a status change from small to medium hub per 49 USC § 47109(e). **(5) Private Ownership Pilot Program.** 49 USC § 47109(a)(4) requires a 70% Federal share for projects funded with discretionary at airports in the private ownership pilot program under 49 USC § 47134. **(6) Airport Development Rights Pilot Program.** 49 USC § 47138(b)(2) allows any Federal share up to and including 90% for projects meeting the requirements in Section 8 of Chapter 6. **(7) Zero Emission Airport and Infrastructure Pilot Program**. 49 USC § 47136a(d) requires a 50% Federal share for projects meeting the requirements in Section 6 of Chapter 6. **(8) Fiscal Year 2002 Security Projects.** For fiscal year 2002, 49 USC § 47109(a)(5) allowed a 100% Federal share for certain security projects allowed under Public Law 107-71.

Table 4-7 Federal Share by Airport Type (Including Exceptions)

Airport Type	Normal Federal Share	Exceptions
c. Small Hub **d.** Nonhub Primary	90%	**(1) Temporary Increase to 95%.** Section 161 of Vision 100 (Public Law 108-176, December 12, 2003) added a Note to 49 USC § 47109 to temporarily increase the Federal share of allowable project costs from 90% to 95% for Fiscal Years 2004-2007. Although scheduled to sunset at the end of Fiscal Year 2007, Congress extended this temporary increase from Fiscal Years 2008-2011. The FAA Modernization and Reform Act of 2012 (Public Law 112-95) did not extend this temporary provision, and the Federal share reverted back to 90% except as listed below. **(2) States with Large Amounts of Public Land.** 49 USC § 47109 increases the Federal share at some airports in states with large amounts of publicly owned land. These airports and their increased Federal shares are listed in Paragraph 4-10. **(3) Nonhub Primary Airports in States with Large Amounts of Public Land**. The Consolidated and Further Continuing Appropriations Act, 2015, Section 119F, modifies the Federal share of certain nonhub primary airports. The bill amends 49 USC § 47109(c)(2). Specifically, if a primary non-hub airport located in a public land state is within 15 miles of another public land state, the Federal share increases to an average of the two states. If the average is less, the airport Federal share remains the same. APP-500 will publish the list of airports that meet these criteria at the beginning of each fiscal year. **(4) Economically Distressed Areas.** Per 49 USC § 47109(f), the Federal share for smaller airports (those that are not large or medium hubs) who are both receiving Essential Air Service (EAS) and are located in economically distressed areas (EDA) is 95%. APP-500 will obtain a list of the EAS airports from the DOT office administering the EAS program. APP-500 will use the EDA data published by the Federal Highway Administration to determine which EAS airports are in EDAs. APP-500 will publish the list of airports that meet these criteria at the beginning of each fiscal year and will not make mid-year changes based on new EAS or EDA data. **(5) Innovative Finance Grants**. A grant issued under the innovative finance demonstration program per 49 USC § 47135 may have a flexible Federal shares. **(6) Insular Areas**. Airports in American Samoa, Guam, the U.S. Virgin Islands, or the Northern Mariana Islands have a waiver of up to $200,000 of the sponsor's share per 33 USC § 2310. Therefore, a grant of up to $800,000 at the 75% participation rate needs no contribution from the sponsor.

Table 4-7 Federal Share by Airport Type (Including Exceptions)

Airport Type	Normal Federal Share	Exceptions
		(7) Turbine Powered Aircraft. 49 USC § 47116(d)(2) directs the FAA to give consideration to airport development projects to support operations by turbine powered aircraft if the non-Federal share of the project is at least 40%. For these projects, the Federal share must be less than 60%. **(8) Private Ownership Pilot Program.** 49 USC § 47109(a)(4) requires a 70% Federal share for projects funded with discretionary at airports in the private ownership pilot program under 49 USC § 47134. **(9) Airport Development Rights Pilot Program.** 49 USC § 47138(b)(2) allows any Federal share up to and including 90% for projects meeting the requirements in Section 8 of Chapter 6. **(10) Zero Emission Airport and Infrastructure Pilot Program**. 49 USC § 47136a(d) requires a 50% Federal share for projects meeting the requirements in Section 6 of Chapter 6 **(11) Fiscal Year 2002 Security Projects.** For fiscal year 2002, 49 USC § 47109(a)(5) allowed a 100% Federal share for certain security projects under Public Law 107-71.
e. Nonprimary Commercial Service **f.** General Aviation **g.** Reliever	90%	**(1) Temporary Increase to 95%.** Section 161 of Vision 100 (Public Law 108-176) added a note to 49 USC § 47109 to temporarily increase the Federal share of allowable project costs from 90% to 95% for Fiscal Years 2004-2007. Although scheduled to sunset at the end of Fiscal Year 2007, Congress extended this temporary increase from Fiscal Years 2008-2011. The FAA Modernization and Reform Act of 2012 (Public Law 112-95) did not extend this temporary provision, and the Federal share reverted back to 90% except as listed below. **(2) States with Large Amounts of Public Land.** 49 USC § 47109 increases the Federal share at some airports in states with large amounts of publicly owned land. These airports and their increased Federal shares are listed in Paragraph 4-10. **(3) Nonprimary Commercial Service Airports in States with Large Amounts of Public Land.** The Consolidated Appropriations Act, 2017, Section 119E, modifies the Federal share of certain nonprimary commercial service airports. The bill amends 49 USC § 47109(c)(2). Specifically, if a nonprimary commercial service airport located in a public land state is within 15 miles of another public land state, the Federal share increases to an average of the two states. If the average is less, the airport Federal share remains the same. APP-500

Table 4-7 Federal Share by Airport Type (Including Exceptions)

Airport Type	Normal Federal Share	Exceptions
		will publish the list of airports that meet these criteria at the beginning of each fiscal year. **(4) Nonhub Primary Airports in States with Large Amounts of Public Land**. The Consolidated and Further Continuing Appropriations Act, 2015, Section 119F, modifies the Federal share of certain nonhub primary airports. The bill amends 49 USC § 47109(c)(2). Specifically, if a primary non-hub airports located in a public land state is within 15 miles of another public land state, the Federal share increases to an average of the two states. If the average is less, the airport Federal share remains the same. APP-500 will publish the list of airports that meet these criteria at the beginning of each fiscal year. **(5) Economically Distressed Areas.** Per 49 USC § 47109(f), the Federal share for smaller airports (those that are not large or medium hubs) who are both receiving Essential Air Service (EAS) and are located in economically distressed areas (EDA) is 95%. APP-500 will obtain a list of the EAS airports from the DOT office administering the EAS program. APP-500 will use the EDA data published by the Federal Highway Administration to determine which EAS airports are in EDAs. APP-500 will publish the list of airports that meet these criteria at the beginning of each fiscal year and will not make mid-year changes based on new EAS or EDA data. **(6) State Block Grant Subgrants.** Per 49 USC § 47109(a)(2), states may issue state block grant subgrants at a different participation percentage than the associated state block grant. The subgrant participation rate must be equal or lower than the fiscal year Federal percentage rate of the associated state block grant. In FY 2004 and FY 2012, the Federal share for nonprimary airports changed. Per FAA policy, states must either clearly document when they are commingling funds of different Federal percentages within the same subgrant or issue separate subgrants to avoid confusion. **(7) Innovative Finance Grants**. A grants issued under the innovative finance demonstration program per 49 USC § 47135 may have a flexible Federal shares. **(8) Insular Areas**. Airports in American Samoa, Guam, the U.S. Virgin Islands, or the Northern Mariana Islands have a waiver of up to $200,000 of the sponsor's share per 33 USC § 2310. Therefore, a grant of up to $800,000 at the 75% participation rate needs no contribution from the sponsor. **(9) Private Ownership Pilot Program**. 49 USC § 47109(a)(4) requires a 70% Federal share for projects funded with

Table 4-7 Federal Share by Airport Type (Including Exceptions)

Airport Type	Normal Federal Share	Exceptions
		discretionary at airports in the private ownership pilot program under 49 USC § 47134. **(10) Airport Development Rights Pilot Program.** 49 USC § 47138(b)(2) allows any Federal share up to and including 90% for projects meeting the requirements in Section 8 of Chapter 6. **(11) Zero Emission Airport and Infrastructure Pilot Program**. 49 USC § 47136a(d) requires a 50% Federal share for projects meeting the requirements in Section 6 of Chapter 6. **(12) Fiscal Year 2002 Security Projects.** For fiscal year 2002, 49 USC § 47109(a)(5) allowed a 100% Federal share for certain security projects allowed under Public Law 107-71.

4-10. Federal Share Exception for States with Large Amounts of Public Land

49 USC § 47109(b) includes special language that increases the Federal share for airports in states that have more than 5% public or Indian land as defined by the Department of the Interior's Bureau of Land Management. 49 USC § 47109 requires that the FAA determine if an airport is in a public land state and whether the current Federal share is less than the Federal share was on June 30, 1975. On that date, the Federal share of most projects was 50% for *large* hub airports (not *large and medium* hub airports as exists in current legislation) and 75% for all other airport types, plus the bump-up for airports in the public land states.

Table 4-8 contains the increased Federal share for those states that have large amounts of public land. Unless otherwise noted in these tables, the Federal share percentages are based on 49 USC § 47109.

Background information on the calculation of the increased Federal share for states with large amounts of public land is found in Appendix Y.

Table 4-8 Federal Shares by Airport Classification in Public Land States

State	Large Hub Airports	Medium Hub Airports	Small or Nonhub Commercial Service airports*	Non-primary General Aviation and Reliever Airports
a. Alaska (AK)	75	87.76%	93.75%	93.75%
b. Arizona (AZ)	75	91.06%	91.06%	91.06%

Table 4-8 Federal Shares by Airport Classification in Public Land States

State	Large Hub Airports	Medium Hub Airports	Small or Nonhub Commercial Service airports*	Non-primary General Aviation and Reliever Airports
c. California (CA)	75	80.59%	90.66%	90.00%
d. Colorado (CO)	75	79.02%	90.00%	90.00%
e. Idaho (ID)	75	83.51%	93.75%	90.00%
f. Montana (MT)	75	79.47%	90.00%	90.00%
g. Nevada (NV)	75	93.75%	93.75%	93.75%
h. New Mexico (NM)	75	84.29%	93.75%	90.00%
i. Oregon (OR)	75	83.33%	93.75%	90.00%
j. South Dakota (SD)	75	78.55%	90.00%	90.00%
k. Utah (UT)	75	90.63%	90.63%	90.63%
l. Washington (WA)	75	77.31%	90.00%	90.00%
m. Wyoming (WY)	75	84.58%	93.75%	90.00%

* The Consolidated and Further Continuing Appropriations Act, 2015, Section 119F, modifies the Federal share of certain nonhub primary airports. Section 119E of the Consolidated Appropriations Act, 2017 extends the modification of the Federal share to certain non-primary commercial service airports. APP-500 will publish the list of airports that meet these criteria at the beginning of each fiscal year.

4-11. Transfer of Entitlement Funds between Airports.

49 USC § 47117(c) allows the FAA to transfer entitlements between airports. The intention of this statutory provision is to permit a sponsor to share its unused entitlements with another airport so that the funds do not expire or get carried over to future years. The conditions and required agreements for these transfers are outlined in Table 4-9. The Act does not allow the FAA to transfer state apportionment or Alaskan supplemental between states. The Act also does not allow the FAA to transfer entitlements to a state.

Because the FAA must know when entitlements are transferred and between which airports, the FAA requires that the sponsor sign a transfer agreement. This agreement is necessary even when the sponsor owns the airports between which the funds are being transferred.

This requirement *does not* apply to various location grants if each of the airports retains the rights to their specific entitlements per the state sponsorship agreement that is required for various location grants in Table 2-11. The transfer agreement requirement *does* apply to a

various locations grant if entitlements within the grant are being transferred between any of the airports. In this case, FAA Form 5100-110, Agreement for Transfer of Entitlements (see the AIP Forms link in Appendix B) is required for each of the transfers.

Table 4-9 Requirements to Transfer Entitlement Funds between Airports

If a sponsor wants to…	Only the following entitlements can be transferred…	If the following conditions are met…	And the following agreements are provided…
a. Transfer all or part of their entitlements between airports they own per 49 USC § 47117(c)(1).	Passenger	The airport that will receive the entitlements is in the NPIAS. The airport that will receive the entitlements is also owned by the sponsor. The sponsor requests use of the funding through the sponsor's capital improvement plan and/or a grant application.	The sponsor does not have to submit a waiver request or sign FAA Form 5100-110. The ADO does not need to track these actions separately.

Table 4-9 Requirements to Transfer Entitlement Funds between Airports

If a sponsor wants to…	Only the following entitlements can be transferred…	If the following conditions are met…	And the following agreements are provided…
b. Waive receipt of all or part of their entitlements and allowing the FAA to determine which airport will receive the entitlement per 49 USC § 47117(c)(2).	Passenger Cargo Nonprimary	The airport that will receive the entitlements is in the NPIAS. The airport that will receive the entitlements must be in the same state or geographical area. In this case, geographical area means the same or an adjacent Standard Metropolitan Statistical Area. The sponsor must make a written request to the ADO.	If the ADO agrees with the transfer, the ADO (not the sponsor) prepares FAA Form 5100-110. The ADO, sponsor, and sponsor's attorney must execute the agreement in order for the ADO to transfer the funds. The agreement must only specify entitlements of one airport. The ADO must prepare separate agreements if entitlements are being transferred from more than one airport. *Note: The sponsor receiving the transferred entitlements does not incur grant assurance obligations until the sponsor signs a grant that contains the transferred entitlements. The sponsor waiving receipt of the transferred entitlements is not tied to the grant assurances associated with this transferred entitlement.*

Table 4-9 Requirements to Transfer Entitlement Funds between Airports

If a sponsor wants to…	Only the following entitlements can be transferred…	If the following conditions are met…	And the following agreements are provided…
c. Waive receipt of all or part of their entitlements and request they be used at a specific airport per 49 USC § 47117(c)(2).	Passenger Cargo Nonprimary	The airport that will receive the entitlements is in the NPIAS. The airport that will receive the entitlements must be in the same state or geographical area. In this case, geographical area means the same or an adjacent Standard Metropolitan Statistical Area. The sponsor must make a written request to the ADO. The ADO must have concurred with transferring the entitlements to the airport the sponsor has requested. This is because the ADO, not the sponsor, has the decision authority regarding which airport will receive the transferred funds. If the ADO objects to the airport requested by the sponsor, the ADO will inform the sponsor and give the sponsor the option of withdrawing the waiver request. The sponsor is not selling, trading or bartering away their entitlement since this may be construed as using Federal funds in an inappropriate manner. In other words, a sponsor may not trade its entitlements for money or property that would not be eligible under AIP.	If the ADO agrees with the transfer, the ADO (not the sponsor) prepares FAA Form 5100-110, The ADO, the sponsor, and sponsor's attorney must execute the agreement in order for the ADO to transfer the funds. The agreement must only specify entitlements of one airport. The sponsor waiving funds and the sponsor receiving funds have the option to make separate agreements concerning the transfer. This agreement is between the two sponsors. The sponsors and/or their attorneys are responsible for ensuring the legality of the agreement. The FAA is not a party to the agreement, is not required to obtain the agreement, and is not responsible for enforcing the conditions of the agreement. *Note: The sponsor receiving the transferred entitlements does not incur grant assurance obligations until the sponsor signs a grant that contains the transferred entitlements. The sponsor waiving receipt of the transferred entitlements is not tied to the grant assurances associated with this transferred entitlement.*

4-12. Use of Donations (or Previously Acquired Land) as the Sponsor Share.

Per 2 CFR § 200.434, the ADO has the option of allowing a sponsor to use donated items or a credit for previously acquired land as a portion or for the entire sponsor share in a grant. The ADO must use the Table 4-10 to determine if and/or how to offset the sponsor share in a grant.

Table 4-10 Summary of Tables Containing Requirements for using Donations for the Sponsor's Share

The following table…	Contains the following requirements…
Table 4-11.	General requirements.
Table 4-12.	Value requirements.
Table 4-13.	Offset process.
Table 4-14.	Offset examples.

Table 4-11 General Requirements for Offsetting the Sponsor Share of a Grant

For the following items…	The following general requirements apply…
a. Land Donated to the Sponsor	**(1)** The land must be AIP eligible, but does not have to be required for the project. **(2)** The ADO must have concurred with the value of land. The ADO has the option to either implicitly concur with the value by issuing the grant or make a written determination. In either case, the ADO must place the documentation used to support this value in the grant file. **(3)** The sponsor must provide information documenting when the donation or acquisition was or will be made. **(4)** The sponsor must provide a copy of any agreements between the donor and the sponsor and document to the ADO that the donor has/will not receive an exclusive benefit or consideration as a result of the transaction. **(5)** The sponsor must provide the identity of the donor and outline the relationship between the sponsor and the donor. **(6)** The sponsor must document to the ADO that there are no reversion clauses tied to the donation other than reversion back to the donor if and when the land is no longer needed for airport purposes.

Table 4-11 General Requirements for Offsetting the Sponsor Share of a Grant

For the following items…	The following general requirements apply…
	(7) The sponsor must document to the ADO that the donor was not acting as an agent for the sponsor and is not a government or quasi-government entity in the same state as the sponsor. **(8)** The sponsor must add the donated land and document the value that has been credited toward the sponsor share on the Exhibit A. **(9)** The sponsor is bound to Airport Sponsors Assurance 31 for the donated land. **(10)** A description of the land donated as sponsor share must be included in the grant.
b. Land Previously Acquired by the Sponsor	**(1)** The land must be AIP eligible, but does not have to be required for the project. **(2)** The sponsor must document to the ADO that the requirements in Appendix Q have been met. **(3)** The ADO must have concurred with the value of land. The ADO has the option to either implicitly concur with the value by issuing the grant or make a written determination. In either case, the ADO must place the documentation used to support this value in the grant file. **(4)** The sponsor must document the value of the land that has been credited toward the sponsor share on the Exhibit A. **(5)** The sponsor is bound to Airport Sponsors Assurance 31 for the previously acquired land. **(6)** A description of the land donated as sponsor share must be included in the grant.
c. Labor, Materials, Equipment, and Services Donated *to the Sponsor*	**(1)** The ADO must determine that the labor, materials, and/or equipment costs are allowable and necessary project costs that would have normally been included in the grant. **(2)** The sponsor must request the use of the donated labor, materials, and/or equipment costs in writing, and the ADO must have approved the request and the value of the donated items in advance of the grant offer. The ADO must use the sponsor force account requirements provided in Paragraph 3-53 in making this determination. When applying the requirement in Paragraph 3-53, the ADO must simply substitute all references to the sponsor's labor, materials, equipment, or services with the donated labor, materials, equipment, or services.

Table 4-11 General Requirements for Offsetting the Sponsor Share of a Grant

For the following items…	The following general requirements apply…
	(3) The sponsor must provide a copy of any agreements between the donor and the sponsor and document to the ADO that the donor has/will not receive an exclusive benefit or consideration as a result of the transaction. This includes the benefit of the donor avoiding costs they would have normally incurred (for instance, if donor donates excess fill to avoid paying for disposal of the fill, the donor would gain a benefit by not having to pay for the disposal.) **(4)** The sponsor must provide the identity of the donor and outline the relationship between the sponsor and the donor. **(5)** The sponsor must document to the ADO that there are no reversion clauses tied to the donation of equipment or materials. **(6)** The sponsor must document to the ADO that the donor was not acting as an agent for the sponsor and is not a government or quasi-government entity in the same state as the sponsor.
d. Labor, Materials, Supplies, Equipment, and Services Provided *by the Sponsor*	**(1)** These costs are not considered donations under 2 CFR § 200.434. Therefore, a sponsor cannot use these costs against the sponsor's share. **(2)** Instead, the ADO has the option of approving these costs as force account work if all of the requirements for force account work in Paragraph 3-53 are met. Note that force account materials and supplies have the added requirement of needing to be procured per 2 CFR §§ 200 317-200.326

Table 4-12 Value of Items Used to Offset the Sponsor Share

For the following items…	The ADO must determine the value as follows…
a. Land Donated to the Sponsor	**(1)** The ADO must use the fair market value of the land at the time it was donated to the sponsor by an unrelated third party. Per 2 CFR § 200.434, governmental or quasi-governmental organizations located within the same state are not considered unrelated third parties for this purpose. In this case, the ADO must use the fair market value at the time it was first donated by an unrelated third party to a governmental or quasi-governmental organization. **(2)** The ADO must only include the cost of the land. Per 2 CFR § 200.434(b), only the value of the land can be used towards a sponsor's matching share, so costs to acquire the land (title fees, attorney fees, appraisal fees, etc.) are not allowed. **(3)** If the value of the land exceeds the amount needed to cover the sponsor share, the ADO has the option to allow the sponsor to use the unused value for the sponsor share on future grants. In that case, the ADO must correctly describe the amount of land being included as sponsor share and the amount that is being set aside for future sponsor share.
b. Land Previously Acquired by the Sponsor	**(1)** For a public sponsor, the ADO must use the fair market value of the land at the time of purchase, not the current fair market value. **(2)** For a sponsor of a privately-owned airport, 49 USC § 47109(d) requires that the ADO use the current fair market value of the land at the time of the project. **(3)** The ADO must only include the cost of the land. Per 2 CFR § 200.434(b), only the value of the land can be used towards a sponsor's matching share, so costs to acquire the land (title fees, attorney fees, appraisal fees, etc.) are not allowed. **(4)** If the value of the land exceeds the amount needed to cover the sponsor share, ADO has the option to allow the sponsor to use the unused value for the sponsor share on future grants. In that case, the ADO must correctly describe the amount of land being included as sponsor share and the amount that is being set aside for future sponsor share

Table 4-12 Value of Items Used to Offset the Sponsor Share

For the following items…	The ADO must determine the value as follows…
c. Labor, Materials, Equipment and Services Donated to the Sponsor	**(1)** The ADO must use the current fair market value of the donated labor, materials, equipment, and services at the time they are donated. **(2)** The ADO must determine the current market value of the donation by following the sponsor force account requirements provided in Paragraph 3-53. When applying the requirement in Paragraph 3-53, the ADO must simply substitute all references to the sponsor's labor, materials, equipment, or services with the donated labor, materials, equipment, or services.

Table 4-13 Process to Offset the Sponsor Share of a Grant

For the…	The following applies…
a. Donation Value (or Previously Acquired Land Value) Needed for the Grant	The ADO calculates this value using the following formula: = (Project Cost x Sponsor Share %) ÷ Federal Share % As the formula indicates, the calculated value is not a dollar to dollar credit against the sponsor share. If the state is participating, the sponsor share percent used above is the percent the sponsor would be paying (the non-Federal share percent minus the state share percent).
b. Credit Remaining for Future Grants	The ADO calculates this using the following formula: = Land Value – Donation Value (or Previously Acquired Land Value) Applied to the Grant
c. Application Amount	The sponsor must use the following formula to calculate the amount they must show on the grant application: = Project Cost + Donation Value (or Previously Acquired Land Value) Applied to the Grant
d. Application Project Description	The sponsor must list the proposed project as the project to be accomplished under the grant. The sponsor must also show the previously purchased land or donated labor, materials, equipment and/or services as an item that will be used as a full or partial credit against the sponsor share.
e. Grant Amount	The ADO calculates this using the following formula: = Application Amount x Federal Share %

Table 4-13 Process to Offset the Sponsor Share of a Grant

For the…	The following applies…
f. Maximum Obligation in Grant	The ADO shows the entire grant amount under the category of the project (example: $1,000,000 for airport development), not the category of the donated item.
g. Remaining Sponsor Share	The ADO calculates this using the following formula: = Application Amount – Federal Share Amount – Donation Value (or Previously Acquired Land Value)
h. Grant Description	The ADO must use the following format: *[Insert Normal Grant Description]* including a credit of *$[Insert Value of Donation (or Value of Previously Acquired Land) Applied to the Grant]* for the *[Insert either complete or partial]* sponsor share for the *[Insert either complete or partial] [Insert donated if applicable]* value of *[Insert brief description of item being credited – include the parcel numbers for land].*

Table 4-14 Example Calculations for Offsetting the Sponsor Share of a Grant

Examples Include…

EXAMPLE 1: Donated Land, No State Participation, Value of Land Exceeds Sponsor Share.

A general aviation sponsor has a $1,000,000 runway extension project. A local businessman donated a piece of land to the sponsor five years previously, and the appraised fair market value *at the time of donation* was $2,000,000. All other requirements for the donation have been met. The non-Federal share is 10%. In this case, the state is not contributing toward the non-Federal share, therefore the sponsor share is 10%.

Project Cost = $1,000,000 **Federal Share %** = 90% **Sponsor Share %** = 10%

Donation Value Needed for this Grant = Project Cost x Sponsor Share % ÷ Federal Share %
= $1,000,000 x 10% ÷ 90%
= $111,112

Donation Value Remaining for Future Grants = Land Value – Donation Value Applied to the Grant
= $2,000,000 – $111,112
= $1,888,888

Application Amount = Project Cost + Donation Value Applied to the Grant
= $1,000,000 + $111,112
= $1,111,112

Application Project Description: The sponsor must list the runway extension as the project to be accomplished under the grant, and show the land as a donated item that will be used as a credit against the sponsor share.

Grant Amount = Application Amount x Federal Share %
= $1,111,112 x 90%
= $1,000,000

Maximum Obligation in Grant = $1,000,000 for airport development (*$0 for land*).

Grant Description = Extend Runway 9/27 (150’ x 1,000’) including a credit of $111,112 for the complete sponsor share for the partial donation value of Parcel 48.

Participation Breakdown = The FAA contributes $1,000,000 and the sponsor *virtually* contributes $111,112 as a credit, which adds up to the $1,111,112 application amount. This allows the FAA to issue a grant for $1,000,000 to cover both the Federal share of the project costs ($1,000,000 x 90% = $900,000) as well as the sponsor share ($1,000,000 x 10% = $100,000).

Table 4-14 Example Calculations for Offsetting the Sponsor Share of a Grant

Examples Include…

EXAMPLE 2: Previously Acquired Land, State Participation, Value of Land Exceeds Sponsor Share

A general aviation sponsor has a $1,000,000 runway extension project. The sponsor used local funds to purchase a parcel of land, and the appraised fair market value *at the time of acquisition* was $2,000,000. All other requirements for previously acquired land have been met. The non-Federal share is 5%. In this case, the state contributes half of the non-Federal share, or 5% toward the non-Federal share, therefore the sponsor share is also 5%.

Project Cost = $1,000,000 **Federal Share %** = 90% **Sponsor Share %** =5%

Land Value Needed for this Grant = Project Cost x Sponsor Share % ÷ Federal Share %

= $1,000,000 x 5% ÷ 90%

= $55,556

Land Value Remaining for Future Grants = Land Value – Land Value Applied to the Grant

= $2,000,000 – $55,556

= $1,944,444

Application Amount = Project Cost + Land Value Applied to the Grant

= $1,000,000 + $55,556

= $1,055,556

Application Project Description: The sponsor must list the runway extension as the project to be accomplished under the grant, and show the previously purchased land as an item that will be used as a credit against the sponsor share.

Grant Amount = Application Amount x Federal Share %

= $1,055,556 x 90%

= $950,000

Maximum Obligation in Grant = $950,000 for airport development (*$0 for land*)

Grant Description = Extend Runway 9/27 (150’ x 1,000’) including a credit of $55,556 for the complete sponsor share for the partial value of Parcel 48.

Participation Breakdown = The FAA contributes $950,000, the state contributes $50,000, and the sponsor *virtually* contributes $55,556 as a credit, which adds up to the $1,055,556 application amount. This allows the FAA to issue a grant for $950,000 to cover both the Federal share of the project costs ($1,000,000 x 90% = $900,000) as well as the sponsor share ($1,000,000 x 5% = $50,000).

Table 4-14 Example Calculations for Offsetting the Sponsor Share of a Grant

Examples Include…

EXAMPLE 3: Donated Labor/Materials, No State Participation, Value Less than Sponsor Share

A general aviation sponsor has a $1,000,000 runway extension project. A local businessman is willing to donate the sodding required for the project. The ADO approves the request and concurs with the donation value of $10,000. All other requirements for the donation have been met. The non-Federal share is 10%. In this case, the state is not contributing toward the non-Federal share, therefore the sponsor share is 10%.

Project Cost = $1,000,000 **Federal Share %** = 90% **Sponsor Share %** = 10%

Application Amount = Project Cost + Donation Value
= $1,000,000 + $10,000
= $1,010,000

Application Project Description: The sponsor must list the runway extension as the project to be accomplished under the grant, and show the donated sodding as an item that will be used as a partial credit against the sponsor share.

Grant Amount = Application Amount x Federal Share %
= $1,010,000 x 90%
= $909,000

Maximum Obligation in Grant = $909,000airport development

Remaining Sponsor Share = Application Amount – Federal Share Amount – Donation Value
= $1,010,000 - $909,000- $10,000
= $91,000

Grant Description = Extend Runway 9/27 (150’ x 1,000’) including a credit of $10,000 for the partial sponsor share for the complete donated value of required sodding.

Participation Breakdown = The FAA contributes $909,000, the sponsor *virtually* contributes $10,000 as a credit, and the sponsor contributes $91,000 for the remaining sponsor share, which adds up to the $1,010,000 application amount. This allows the FAA to issue a grant for $909,000 to cover both the Federal share of the project costs ($1,000,000 x 90% = $909,000) as well as a portion of the sponsor share ($10,000 x 90% = $9,000), leaving the sponsor to pay for the remaining $91,000 of the sponsor Share (($1,000,000 x 10%) - $9,000).

4-13. Budget Augmentation (Combining Funds between Different Federal Programs).

Each Federal program is supported by appropriations, and the funding limits set out in the relevant legislation are the limits of that program. Combining Federal funding is considered improper budget augmentation unless *specific authority* is contained in the legislation to do so. The Handbook calls out those rare instances where legislative authority has been granted for budget augmentation within an AIP grant. These instances are included in Table 4-15.

More information on the rules regarding Federal budget augmentation is contained in the Government Accountability Office's (GAO) Principles of Federal Appropriations Law, Third Edition, commonly referred to as the Red Book. APP-520 is also available for further guidance.

Table 4-15 Instances of Allowable Budget Augmentation

Some examples Include…	
a.	Economic development agency and Appalachian regional commission grants, which have specific authority to give grants for local matching share of other Federal programs.
b.	Costs for instrument landing systems to be transferred to the FAA under appropriation statutes.
c.	The incidental costs for clearing, grading and grubbing for an AIP project that may also provide site preparation for FAA facilities.

Chapter 5. How does the grant process work?

Section 1. Basic Grant Steps.

5-1. Basic Grant Steps.

Table 5-1 captures the basic steps in the grant process as outlined in the following sections of this chapter.

Table 5-1 The Basic Steps in the Grant Process

The basic steps are…
a. Pre-Grant Actions.
b. Grant Programming.
c. Grant Application, Offer, and Acceptance.
d. ADO Grant Oversight.
e. Grant Payment.
f. Grant Amendment.
g. Grant Closeouts.
h. Grant Suspension and/or Termination.
i. Post-Grant Actions.

Section 2. Pre-Grant Actions.

5-2. Introduction.

There are many actions that need to be taken before an AIP eligible project is ready to be considered for inclusion in a grant. Table 5-2 captures these major actions. The subsequent explanations in this section discuss which actions apply to which types of projects.

Table 5-2 The Major Pre-Grant Actions

The major actions include…
a. Identification of Potential Projects by Sponsors and ADO.
b. Early Coordination between ADO and Sponsor.
c. ADO Verification of Sponsor Eligibility.
d. ADO Verification that All Project Requirements Will Be Met.
e. ADO Verification that Airport Layout Plan is Current.
f. ADO Notification to New Sponsors of Flood Insurance Requirements.
g. ADO Notification and Verification of Sponsor Civil Rights Requirements.
h. ADO Verification that Risk Level Determination is Current.
i. ADO Review of Open Grant Status.
j. ADO Verification that Competition Plan is Current.

5-3. Identification of Potential Projects by Sponsors and ADO.

Sponsors normally develop 20-year airport development plans and often engage in other planning efforts. From these activities, the sponsor develops their capital improvement plan and submits it to the ADO. The ADO then uses this information, as well as other pertinent information available in house, to identify projects that meet the applicable requirements in Chapter 3.

The FAA Office of Airports uses this data to create a five year National Plan of Integrated Airport Systems (NPIAS) Report outlining the projects that are eligible and justified for AIP funding. The Secretary of Transportation is required to publish this plan every two years per 49 USC § 47103. The FAA Office of Airports then creates an Airports Capital Improvement Plan (ACIP) to identify the projects that may be funded with AIP over the next three years.

FAA inclusion of the project in the NPIAS or the ACIP is not a guarantee of funding, nor is the value of the project considered a final determination by the FAA.

Detailed information on the NPIAS and ACIP processes are found in the current versions of FAA Order 5100.39, Airports Capital Improvement Plan and FAA Order 5090.3, Field Formulation of the National Plan of Integrated Airport Systems.

It is important that during this process the ADO discuss the projects listed in Table 5-3 with the sponsor and determine when the projects will be addressed. This is because these items have

been determined by Congress to be of special interest, are required by rule or regulation, or if not implemented, can affect the utility of the airport in the future.

Table 5-3 Important Potential Projects for ADO/Sponsor Discussion

Important projects include…
a. Clear Runway Approaches. Per 49 USC § 47107(a)(9), the sponsor must take appropriate action to ensure that terminal airspace required to protect instrument and visual operations to the airport (including operations at established minimum flight altitudes) will be cleared and protected by mitigating existing, and preventing future, airport hazards. (*Note: 49 USC § 47107(a)(9) uses the term "operations to the airport", which includes departures and approaches. Because design surfaces are typically described in terms of approach surfaces or missed approach surfaces, the term "approaches" describes the clearance surfaces required to protect operations to or from a runway.*)
b. Compatible Land Use Issues. Per 49 USC § 47107(a)(10), the sponsor must take appropriate action (to extent reasonable) to restrict the use of land next to or near the airport to uses that are compatible with normal airport operations. For example, if there are residential uses surrounding the airport, acquisition of the properties or soundproofing the houses may be appropriate.
c. Congressionally Mandated Items. 49 USC § 47101(f) lists high priority projects at commercial service airports (to be given consideration to the extent possible with available money and considering other safety needs). The items on this list include: **(1)** Electronic or visual vertical guidance on each runway. **(2)** Grooving or friction treatment of each primary and secondary runway. **(3)** Distance-to-go signs for each primary and secondary runway. **(4)** A precision approach system, a vertical visual guidance system, and a full approach light system for each primary runway. **(5)** A non-precision instrument approach for each secondary runway. **(6)** Runway end identifier lights on each runway that does not have an approach light system. **(7)** A surface movement radar system at each category III airport (per FAA policy, not eligible for AIP). **(8)** A taxiway lighting and sign system. **(9)** Runway edge lighting and marking. **(10)** Radar approach coverage for each airport terminal area (per FAA policy, not eligible for AIP). **(11)** Runway and taxiway incursion prevention devices, including integrated in-pavement lighting systems for runways and taxiways (per FAA policy, may have limited eligibility).
d. 14 CFR 139 Violations. 14 CFR part 139 requires certificated airports to meet certain standards, including required safety and signage. The ADO is encouraged to review the latest 14 CFR part 139 inspection report to determine if there are any AIP eligible equipment or development items that need to be addressed.

5-4. Early Coordination between ADO and Sponsor.

The ADO has the option to give the sponsor some preliminary indication (for planning purposes only) of the likelihood of the FAA being able to consider funding for a given project, focusing not just on eligibility and justification but also on whether and when funds might become available (including all categories of AIP funds). In such cases, the ADO must make it clear to the sponsor that such early indications do not represent a decision or commitment, and that many factors, including national, regional and local issues may affect the ultimate decision. The ADO must also make it clear that it is the sponsor's decision whether and when to initiate any steps that might be required in order to be ready if and when the FAA is ultimately able to award a grant. Finally, the ADO must ensure that such early indications, as well as any early actions by the sponsor, cannot be misconstrued as pre-decisional, particularly if environmental review processes are still underway.

The ADO also has the option to notify the sponsor of the favorable potential for receiving Federal funding in the upcoming fiscal year. This is not a commitment nor a guarantee of funds but simply a notice that funding for the project appears favorable and that the sponsor has the option to initiate actions that require long lead times in order to avoid potential delays in the grant process.

In addition, the sponsor must develop a realistic project schedule that will ensure that the grant can proceed in a timely manner. The ADO may request sponsor coordination of this schedule. The schedule must set realistic sponsor deadline dates for key steps in the grant process because a sponsor's failure to complete these steps in a timely manner may seriously impact or delay project funding. Table 5-4 contains common key steps.

Table 5-4 Common Key Steps in the Grant Process

Common key steps include…	
a.	Submission of a benefit-cost analysis (for projects such as certain NAVAIDS, projects requesting $10 million or more in discretionary funding over the life of the project, new airport projects, capacity projects).
b.	Submission of environmental review documents.
c.	Selection of sponsor's engineer.
d.	Completion of final plans and specifications and engineer's report.
e.	Submission of aeronautical study to coordinate the project with other FAA lines of business and other Federal agencies.
f.	Submission of construction safety phasing plan.
g.	Completion of safety management system (SMS) coordination.
h.	Submission of disadvantaged business enterprise (DBE) plan.

Table 5-4 Common Key Steps in the Grant Process

Common key steps include…	
i.	Completion of necessary land acquisition and relocation of displaced persons.
j.	Adoption of a zoning ordinance or other compatible land use measures.
k.	Submission of title evidence or attorney certification of title.
l.	Coordination with planning agencies.
m.	Notice of intent to use entitlement funds (to meet the deadline published in the annual Federal Register Notice).
n.	Receipt of current wage rates.
o.	Advertisement for bids.
p.	Opening of bids.
q.	Submission of Application for Federal Assistance.
r.	Acceptance of grant offer.
s.	Award of contract.
t.	Completion of the pre-construction conference.

5-5. ADO Verification of Sponsor Eligibility.

The ADO must verify that all of the sponsor requirements in Chapter 2 have been met.

5-6. ADO Verification that All Project Requirements Will Be Met.

The ADO must verify that all of the sponsor requirements in Chapter 3 and the appropriate project requirement appendix will be met by the required time in the grant process.

5-7. ADO Verification that Airport Layout Plan is Current.

Per 49 USC § 47107(a)(16), the sponsor must maintain a current layout plan of the airport in order to receive an airport design, construction, or equipment grant as defined under 49 USC § 47102(3). The ALP that is on file with the ADO must reflect the current and proposed conditions at the airport and all proposed and existing access points used to taxi aircraft across the airports property boundary.

5-8. ADO Notification to New Sponsors of Flood Insurance Requirements.

Per the Flood Disaster Protection Act of 1973, sponsors with an airport in a Federal Emergency Management Agency (FEMA) identified area having a special flood hazard must participate in the National Flood Insurance Program.

The ADO is responsible for advising new sponsors of this requirement and advising that there are additional details available at the FEMA website (see Appendix B for link). Sponsor will be certifying in the grant assurances that they comply with this requirement for acquisition and construction projects.

5-9. ADO Notification and Verification of Sponsor Civil Rights Requirements.

Sponsors (including block grant states) receiving AIP funding must follow all applicable civil rights requirements in Table 5-5. Sponsors must work directly with the FAA Office of Civil Rights (ACR) to ensure that all of these requirements have been met.

The ADO is responsible for advising new sponsors to contact ACR to discuss these requirements.

The ADO is also responsible for coordinating with ACR before a grant is issued to verify that the DBE plan, goals and monitoring (and ACDBE plan, goals and monitoring if the airport is a commercial service airport) have been accepted by ACR.

Table 5-5 Sponsor Civil Rights Requirements

Civil rights requirements for sponsors include…
a. **Disadvantaged Business Enterprise (DBE) Program.** 49 CFR part 26; Airport Sponsors Assurances #1 and #37; Planning Agency Sponsors Assurances #1 and #13; Non-Airport Sponsors Undertaking Noise Compatibility Program Projects Assurances #1 and #22; and 49 USC § 47113. The sponsor must have a DBE program if they will be receiving $250,000 or more in AIP funding during a Federal fiscal year. Contracts solely for the purpose of land are excluded. Block grant states must submit either a single overall goal or multiple goals that cover all of the subgrants funded during a fiscal year.
b. **Airport Concessions Disadvantaged Business Enterprise (ACDBE) Program.** 49 CFR part 23; Airport Sponsors Assurance #1 and #37; and 49 USC § 47107(e).
c. **Americans with Disabilities Act (ADA).** Titles II & III. Section 504 of the Rehabilitation Act of 1973; Airport Sponsors Assurances #1, #30, and #34; Planning Agency Sponsors Assurance #1 and #9; Non-Airport Sponsors Undertaking Noise Compatibility Program Projects Assurances #1 and #17; 49 USC § 47123 and § 47107; 49 CFR parts 27, 37, and 38; and 28 CFR parts 35 and 36.

Table 5-5 Sponsor Civil Rights Requirements

Civil rights requirements for sponsors include…
d. Air Carrier Access Act of 1986 (ACAA). 14 CFR part 382.
e. Title VI of Civil Rights Act of 1964. 42 USC § 2000d, et seq. As a condition of receiving any Federal funding assistance, all sponsors are subject to and agree to comply with the Standard Title VI/Non-Discrimination Assurances. In addition, the Standard Title VI/Non-Discrimination Assurances are also binding on subrecipients, subgrantees, contractors, successors, transferees, and/or assignees.

5-10. ADO Verification that Risk Level Determination is Current.

Based on a DOT Office of Inspector General (OIG) audit and findings related to the FAA's administration of AIP, the FAA has implemented a risk base oversight system to minimize the risk of misuse of funds by sponsors. The FAA uses a tiered ranking system to assign a risk level to each sponsor. The risk level defines the level of oversight needed. Current detailed guidance on how to assign sponsor risk a level is contained in the Airport Improvement Program (AIP) Grant Oversight Risk Model Policy (see Appendix B for link).

At this point in the process, the ADO must verify that a risk level has been assigned to the sponsor and is still current. If not, it is FAA policy that the ADO must complete the original determination or redo the risk level assignment.

5-11. ADO Review of Open Grant Status.

Per FAA policy, the ADO must determine if the sponsor has any open grants older than four years or that have not had a payment request for 18 months or more. If so, the ADO must obtain the reason why and the sponsor's plans to address the situation.

This is because 49 USC § 47106(a)(4) requires that the sponsor carry out and complete AIP funded projects without unreasonable delay, and a history of old and/or inactive grants may be an indicator that the sponsor may not be able to comply with this requirement.

5-12. ADO Verification that Competition Plan is Current.

For certain medium and large hub airports, the ADO must verify that all required competition plans and updates are approved. The competition plan requirements are discussed in detail in Appendix W.

Section 3. Grant Programming.

5-13. Introduction.

Once the ADO has completed the pre-grant actions in the previous section, there are four major steps before the grant application can be processed.

a. Project Evaluation Report and Development Analysis (PERADA)

b. Grant Programming

c. Congressional Notification

d. Sponsor Notification

5-14. Project Evaluation Report and Development Analysis (PERADA) Completion.

FAA Form 5100-109, Project Evaluation Report and Development Analysis (see the AIP Forms link in Appendix B), is an optional checklist that the ADOs may use to ensure that certain important statutory, regulatory and grant requirements listed in this Handbook have been considered prior to a grant being programmed. If the ADO's PERADA review identifies any items that are not met at the time of programming, this checklist can act as a useful tool for the ADO in following up on these items at the appropriate time during the grant process. For example, if a required aeronautical case was not approved prior to the ADO programming the grant, the ADO must follow up and make sure the aeronautical case was approved prior to the issuance of the grant offer.

While it is mandatory for the ADO to review the items on the PERADA checklist, the use of the checklist itself is not mandatory. By issuing the grant, the ADO confirms that all of the applicable requirements as detailed in this Handbook have or will be met.

5-15. Grant Programming.

Grant programming is defined as the ADO action of creating a proposed grant in the automated AIP system. At this point, the ADO may enter the project into the automated AIP system based on estimates found in the sponsor's capital improvement plan or in cost estimate updates provided by the sponsor. In the past, sponsors provided these costs to the ADO in a preapplication. Formal preapplications are no longer required.

After this is done, the grant is then reviewed at various levels within the FAA Office of Airports. If the grant is approved, it is then ready to begin the congressional notification process.

5-16. Congressional Notification.

If the FAA Office of Airports approves the grant, the grant then is forwarded to the FAA Office of Government and Industry Affairs (AGI). AGI reviews the grant and forwards it electronically to the DOT Office of the Secretary (OST).

After reviewing the grant, OST notifies the appropriate congressional office that the congressional office can publicly announce the grant. The OST process varies depending on the type and amount of funding involved and current legislative requirements. OST electronically notifies the FAA when this process is complete (often referred to as the OST release date).

The FAA can share specific grant information with the public (including the sponsor) only *after* the OST release date is entered in the automated AIP system.

5-17. Sponsor Notification.

After the congressional notification process is complete, the FAA Office of Airports posts the grant on the FAA Office of Airports website (see AIP Grant History link in Appendix B for link). This is considered the official FAA notification to the sponsor that the ADO has authority to issue a grant for the project. The ADO has the option of also directly notifying the sponsor.

Section 4. Grant Application, Offer, and Acceptance.

5-18. Introduction.

The ADO and sponsor must complete the steps listed below as part of the grant application, offer, and acceptance process.

a. Grant Application Package Submittal

b. Grant Application Review

c. Funds Reservation

d. Grant Offer

e. Grant Acceptance

f. The FAA Office of Finance and Management, FAA Accounts Payable Section B (AMK-314) Notification

5-19. Grant Application Package Submittal.

a. Timing of Submission. Sponsors must submit a complete and correct grant application package prior to the ADO issuing a grant offer.

b. Grant Application Package Contents. Table 5-6 outlines what a sponsor must submit in a grant application package. The ADO will advise the sponsor how many original and/or copies must be submitted to the ADO.

Table 5-6 Grant Application Contents

For the following…	The sponsor submittal requirement is…
a. Application for Federal Assistance (Standard Form 424)	**Mandatory**. Sponsors must sign and submit the latest version this form as part of all grant application packages (see the AIP Forms link in Appendix B). The signed grant application is contractually referenced in the grant agreement and a signed copy must be included in the ADO grant file.
b. Application for Development Projects (Parts II through IV) (FAA Form 5100-100)	**Mandatory.** FAA Form 5100-100, or its equivalent, must be submitted for all projects (see the AIP Forms link in Appendix B). The term *its equivalent* is intended to allow sponsors to create their own documents that contain the exact information requested in FAA Form 5100-100, but allows them to include sponsor-specific information or data. This form provides supporting grant information such as the source of the sponsor share, detailed cost breakdowns, project specific information (such as narratives and justifications), and confirmation that items such as coordination with on airport users has been accomplished. Per FAA policy, contingency costs are not allowed because the ADO has the option to amend an AIP grants, dependent on eligibility and availability of funding, to reflect final costs. Therefore, sponsors must leave Part III, Budget Information Item 18 (Contingencies) blank. **Optional for the State Block Grant Applications**. The ADO has the option to request this information, but states do not normally include this in a state block grant application. The state must collect this information for subgrants in accordance with their State Block Grant Program Memorandum of Agreement.
c. Application for Planning Projects (Parts II through IV) (FAA Form 5100-101)	**Mandatory for Planning Projects if FAA Form 5100-100 is Not Used.** For planning projects, sponsors can submit FAA Form 5100-101, or its equivalent, instead of FAA Form 5100-100 (see the AIP Forms link in Appendix B). The term *its equivalent* is intended to allow sponsors to create their own documents that contain the exact information requested in FAA Form 5100-101, but allows them to include sponsor-specific information or data. **Optional for the State Block Grant Applications**. The ADO has the option to request this information, but states do not normally include this in a state block grant application. The state must collect this information for subgrants in accordance with their State Block Grant Program Memorandum of Agreement.

Table 5-6 Grant Application Contents

For the following…	The sponsor submittal requirement is…
d. Detailed Project Narratives and/or Cost Breakdowns (beyond that provided in either FAA Form 5100-100 or FAA Form 5100-101)	**At the Request of the ADO.** Sponsors must provide an additional detailed narrative summary statement and/or a detailed project cost breakdown (beyond that provided in either FAA Form 5100-100 or FAA Form 5100-101) if requested by the ADO. The detailed summary will normally include a description and justification for *each* of the projects in the grant. The detailed project cost breakdowns will normally be in sufficient detail for the ADO to determine whether the project costs for *each* of the projects are reasonable. **Optional for State Block Grant Applications**. The ADO has the option to request this information (especially for discretionary projects), but states do not normally include this in a state block grant application. The state must collect this information for subgrants in accordance with their State Block Grant Program Memorandum of Agreement.
e. Project Sketches	**At the Request of the ADO**. Sponsors must provide an 8 ½" x 11" or larger sketch for each of the projects if requested by the ADO. This sketch must clearly identify the limits of the proposed project and its location on the airport. For land acquisition projects, the sketch must show the boundaries of currently owned land and the boundaries and proposed property rights of each parcel of land or easement to be acquired, and include parcel numbers and acreage. **Optional for State Block Grant Applications**. The ADO has the option to request this information (especially for discretionary projects), but states do not normally include this in a state block grant application. The state must collect this information for subgrants in accordance with their State Block Grant Program Memorandum of Agreement.
f. Project Documentation Needed For ADO Reasonableness Determination	**Mandatory**. Sponsors must provide all of the documentation necessary for the ADO to make a cost reasonableness determination for the costs contained in the grant application. The sponsor and ADO requirements are discussed in detail in Section 14 of Chapter 3. It is FAA policy that a sponsor must submit the grant application incorporating actual bid or negotiated agreement amounts. The ADO has an option to accept a grant application based on estimates when actual bids or negotiated agreement amounts are not available, however this practice is suboptimal because it may unnecessarily tie up funding that could be used on other projects.

Table 5-6 Grant Application Contents

For the following…	The sponsor submittal requirement is…
g. Exhibit A	**Mandatory (If A Current Approved Version is Not On File in the ADO).** The ADO must have a current approved Exhibit A (property inventory map) on file prior to issuing a grant at that airport because it is contractually referenced in the grant agreement. If the airport is a first time sponsor, or the Exhibit A is not up to date, the ADO must require the sponsor to submit an Exhibit A. Otherwise, the ADO may allow the sponsor to include the Exhibit A on file by reference in Part II, Section C of FAA Form 5100-100 (or equivalent). The following documents contain guidance on Exhibit A requirements: **(1)** The current version of Advisory Circular 150/5100-17, Land Acquisition and Relocation Assistance for Airport Improvement Program Assisted Projects **(2)** The current version of FAA Order 5190-6, FAA Airport Compliance Manual **(3)** The current version of FAA Order 5100.37, Land Acquisition and Relocation Assistance for Airport Projects **Optional for State Block Grant Applications**. The ADO has the option to request this information, but states do not normally include this in a state block grant application. The state must collect this information for subgrants in accordance with their State Block Grant Program Memorandum of Agreement.
h. Title Certificate or Long Term Lease Agreement	**At the Request of the ADO**. Sponsors must have good title for the land on which they will be constructing the project. The ADO has the option of requiring copies of the title certificates or long term lease agreement for the grant file. **Optional for State Block Grant Program**. The ADO has the option to request this information, but states do not normally include this in a state block grant application. The state must collect this information for subgrants in accordance with their State Block Grant Program Memorandum of Agreement.

5-20. Grant Application Review.

The ADO must review the application and supporting documents for accuracy and completeness. The ADO may adjust the depth and intensity of the review in accordance with the complexity of the project, the amount of the grant, the size of the airport, and past experience with that sponsor. The ADO may also request that the sponsor provide any additional information needed for the ADO to complete this review. By issuing the grant offer, the ADO is officially approving the projects in the grant application.

a. Minimum Grant Amount. Per FAA policy, the ADO must not process applications for grants totaling less than $25,000 in Federal funding unless the ADO has received APP-520 concurrence that it is clearly advantageous to the Federal government. The ADO documents this determination of this being clearly advantageous by issuing the grant. Note that the sponsor has the option to include multiple projects in the grant application to meet or exceed this $25,000 requirement.

b. All Pre-Grant Actions Complete. Before the ADO can issue a grant, the ADO must verify that all of the pre-grant actions in Section 2 of this chapter (verification of sponsor eligibility, current ALP, etc.) have been completed.

c. Determination of Reasonableness of Grant Amounts. Before the ADO can issue a grant, the ADO must determine that all of the applicable requirements for costs are reasonable as required in Section 14 of Chapter 3. This is an important and mandatory part of the ADO grant application review process. The ADO's reasonableness determination is not covered by sponsor certifications and the ADO cannot delegate this responsibility.

5-21. Reservation of Funds.

If the ADO finds the grant application to be in order, the ADO must reserve the funds in the automated AIP system. The system generates an electronic FAA Form 1413-1, Request for Change in Reservation/Obligation. The ADO has the option of printing a copy of this form and placing it in the grant file, however, this is not mandatory because the form is retained in the automated AIP system. This is reviewed in the system at the regional level and if approved, the system forwards the request to the FAA Office of Finance and Management, FAA Accounts Payable Section B (AMK-314) for AMK-314's acceptance. Once AMK-314 accepts the reservation in the system, the funds are officially reserved.

Project and funding changes may be made by the ADO after the congressional notification process. Normally this is due to differences between the estimated costs and the actual bid amounts. Occasionally this occurs because the sponsor wants to change, add, or delete a project. In these instances, the ADO must ensure that this is not a substitute for proper planning or estimating. Project and funding changes after congressional notification may require APP approval or additional congressional notification as follows.

a. APP-520 Approval. The ADO must obtain APP-520 approval for the following two types of program changes to projects that have gone through congressional notification:

(1) Replacement of a Project Receiving Discretionary Funds. Replacement of a project that is receiving discretionary funding with another project.

(2) New Lower Priority Entitlement Project at an Airport Receiving Discretionary Funds. Replacement of a project that has a lower priority than a project the airport has or will receive discretionary funds in the same fiscal year. This is because discretionary distributions are based in part on how an airport is using its entitlements.

b. Additional Congressional Notification. If the grant amount is increased after congressional notification, the ADO may be required to send the grant back through the

congressional notification process. APP-520 provides the criteria for sending a grant back through congressional notification process based on legislation and DOT Office of the Secretary (OST) requirements.

5-22. Grant Offer.

There are multiple items that are part of a grant offer package. The ADO must include all of these items in the grant file and is only required to send some of these items to the sponsor.

a. Grant Offer Package Components. The grant offer package consists of the components listed in Table 5-7. All of these components must be filed by the ADO in the applicable grant file.

b. Items Sent to Sponsor. The grant offer sent to the sponsor must contain items a-f in Table 5-7 (the ADO has the option of sending the sponsor certifications to the sponsor before the sponsor receives the grant offer). The ADO also has the option of attaching any of the other components.

Table 5-7 Grant Offer Package

The following items are components of the grant offer package…
a. Grant Cover Letter.
b. Grant Agreement.
c. Applicable Special Conditions.
d. Grant Assurances.
e. Sponsor Certifications.
f. Current FAA Advisory Circulars Required for Use in AIP Funded and PFC Approved Projects.
g. Applicable State Agency Agreements.
h. The Entire Grant Application (see Paragraph 5-19 for requirements).

c. Grant Cover Letter. Traditionally, the grant cover letter highlights important grant information to the sponsor. This may include when the grant needs to be returned, how many copies the ADO requires, and reference to any special conditions the ADO wants to emphasize. The ADO must use the grant cover letter template provided in the automated AIP system. Per 49 USC § 47116, the ADO must include the following sentence in all grant offer letters except those for medium or large hub: *Please note that this grant offer may be funded all or in part, with funds from the Small Airport Fund.*

d. Grant Agreement. A fully signed and executed grant agreement is a binding agreement obligating the sponsor and the FAA to the terms and conditions of the grant agreement. There are three basic types of grant agreements. These are the traditional, the multi-year, and the state block grant. Table 5-8 contains general requirements that apply to all three types of grants, and Table 5-9 contains specific requirements for each of the types of agreements. Table 5-10 includes examples of grant descriptions.

Table 5-8 Requirements for All Grant Agreement Types

The following requirements apply…
a. Grant Description. The ADO must write the grant description in sufficient detail to clearly identify and define each project (see Table 5-10 for examples).
b. Grant Agreement. The ADO must use the grant agreement templates provided in the automated AIP system. Sample traditional, multi-year, state block grant agreements are available on the FAA Office of Airports website (see the AIP Forms link in Appendix B).
c. Standard Conditions. The ADO must not modify the standard grant conditions found in the grant templates. These may only be updated by APP-500.
d. Funding Level. If the grant application is based on actual bid or negotiated agreement amounts, the ADO must issue the grant based on these amounts (not the programmed amount). In addition, the ADO cannot write the grant agreement for more than what is requested in the signed grant application from the sponsor. However, the ADO can write the grant agreement for less than the grant application without requesting an updated application from the sponsor as long as the project components in the grant are included in the signed application and a note is made in the grant file explaining the reduced grant amount.

Table 5-9 Specific Requirements by Grant Agreement Type

For this type of grant agreement…	The following applies…
a. Traditional	**(1) Grant Agreement Format.** The ADO must use the grant agreement template (FAA Form 5100-37, Grant Agreement) provided in the automated AIP system. A sample traditional grant agreement is available on the FAA Office of Airports website (see the AIP Forms link in Appendix B). **(2) Type of Funding.** The ADO must only use current year funding and funding carried over from prior years.

Table 5-9 Specific Requirements by Grant Agreement Type

For this type of grant agreement…	The following applies…
b. Multi-Year	**(1) Applicability.** 49 USC § 47108(a) allows the ADO to issue multi-year grants when the FAA AIP authorization is for multiple years. **(2) Grant Agreement Format.** For a multi-year grant, the ADO must begin with the traditional grant agreement. The ADO must use the grant agreement template provided in the automated AIP system. **(3) Additional Condition.** The multi-year agreement must contain the following extra condition: This project is part of a multi-year grant, which is more fully described in the Special Conditions. The total United States share of the project is $[Enter total estimated Federal cost of multi-year project], and the project is planned to be funded in Fiscal Years [List the fiscal years from Year 1 - End Year]. For the fiscal years in which this project is being funded, the FAA will establish that fiscal year's maximum obligation in a letter to the Sponsor. When the FAA can calculate the funding and incur the obligation, the FAA will issue this letter to the Sponsor. Funding which will be subject to the restriction on the use of such apportionments imposed on FAA by existing and future Appropriations Acts. This commitment does not in itself obligate, preclude, or restrict the FAA in the use of any funds made available for discretionary use to further aid the Sponsor in meeting the cost of this project. **(4) Special Condition.** The ADO must also include a special condition regarding the subsequent multi-year amendments to the grant. The automated AIP system contains the current available special conditions. **(5) Type of Funding.** Under this type of grant, the ADO allows the sponsor to commit the sponsor's future year entitlement funds (passenger, cargo, or nonprimary) within the grant. However, the ADO can only commit funds to a multi-year grant for years within the current program authorization. For example, The FAA Modernization and Reform Act of 2012 (Public Law 112-95) reauthorization was in effect from fiscal year 2012 through the end of fiscal year 2015. The ADO could have written a multi-year grant written in FY2013 that committed the sponsor's fiscal year 2013 – 2015 entitlements. The ADO could not have committed the sponsor's fiscal year 2016 entitlements because it is outside of the authorization period. **(6) Initial Year Requirements.** The initial year of a multi-year grant must include sponsor entitlement funds (passenger, cargo, or nonprimary) and may include other types of funds such as discretionary. The initial year funding is shown as the grant amount in the initial grant (the total multi-year grant amount is captured in the additional clause discussed above). **(7) Future Year Requirements.** Only sponsor entitlement funds (passenger, cargo, or nonprimary) can be used for the future years of a multi-year grant. The future year funds are added to the initial grant by a multi-year amendment (see multi-year amendments under Paragraph 5-55). **(8) Total Multi-Year Funding Amount.** The total multi-year funding amount is the sum of the initial year and future years. This amount is captured in the additional clause discussed above.

Table 5-9 Specific Requirements by Grant Agreement Type

For this type of grant agreement…	The following applies…
c. State Block Grant	**(1) Grant Agreement Format.** The ADO must use the state block grant agreement provided in the automated AIP system. **(2) Type of Funding.** The ADO must only use current year funding and funding carried over from prior years. **(3) Number of Grants per Fiscal Year.** The ADO may write as many state block grants during a fiscal year as it deems prudent. For example, although one grant could be issued for the year, it may be beneficial to write one grant for state apportionment, one for non-primary entitlement, and one or more for specific discretionary projects. **(4) Passenger, Cargo, and Nonprimary Entitlements.** If the state block grant contains entitlements, the ADO must list the airport name, city, and associated entitlement type and amount. (Note that if passenger entitlements are included in the state block grant, these are the passenger entitlements allocated to virtual primary airports under 49 USC 47114(c)(1).) **(5) Discretionary Funds.** If the state block grant contains discretionary funds, the ADO must list the airport name, airport city, the discretionary funding amount, and a brief description of the project (see Table 5-10). The ADO has the option to issue these discretionary projects under a separate state block grant, which may be preferable for timing and/or tracking purposes. **(6) Special Conditions.** Special conditions are normally included by the state in the specific subgrants. However, the ADO has the option of adding special conditions to the state block grant if the ADO deems it appropriate. The automated AIP system contains the current available special conditions.
d. Grant Amendments	**(1) Grant Amendments.** The requirements for grant amendments are included in Section 7 of this chapter.

Table 5-10 Examples of Grant Descriptions

For the following projects involving…	The following description information is appropriate…	And examples include…
a. Runways	**(1)** The runway number. **(2)** The length, width, and location on the runway where the work is being accomplished.	Reconstruct Runway 13/31 (9,000' x 150'). Rehabilitate Runway 10/28 between Taxiway A1 and A2 (500' x 150'). Extend Runway 9/27 (200' x 150' northeast).
b. Runways (Phased over three grants)	**(1)** The runway number. **(2)** The length, width, and location on the runway where the work is being accomplished.	Reconstruct Runway 13/31 Phase 1 Design (9,000' x 150'). Reconstruct Runway 13/31 Phase 2 (South 4,000' x 150'). Reconstruct Runway 13/31 Phase 3 (North 5,000' x 150').
c. Taxiways	**(1)** The taxiway number. **(2)** The length, width, and location on the taxiway where the work is being accomplished.	Reconstruct Taxiway A (9,000' x 75'). Rehabilitate Taxiway B between Taxiway A1 and A2 (500' x 50'). Extend Taxiway C (200' x 50' to the end of Runway 9).
d. Aprons	**(1)** The name of the apron (or reference by location). **(2)** The length, width, and location on the apron where the work is being accomplished.	Rehabilitate the General Aviation Ramp (5000 square feet). Expand the South Terminal Apron (40,000 square feet).
e. Land Acquisition	**(1)** The tract or parcel number. **(2)** The acreage. **(3)** The type of acquisition (easement, fee simple). **(4)** The purpose of the acquisition (RPZ for runway end XX, approach for runway end XX, new airport, future development). **(5)** A short description of any building relocation.	Acquire Parcel A (40 Acres, Fee Simple) for the Runway Protection Zone of Runway 4. Acquire an easement for Parcel 54 (20.3 Acres) for approach protection for Runway 12. Acquire Parcel 84A (5 Acres, Fee Simple) Including Relocation Costs (3 residences, 1 barbershop) for future airport development.

Table 5-10 Examples of Grant Descriptions

For the following projects involving…	The following description information is appropriate…	And examples include…
f. Obstruction Removal or Marking	**(1)** The object being removed. **(2)** If clearing and grubbing is being accomplished, the acreage. **(3)** The runway end on which the obstruction is located.	Remove antenna tower off Runway 4. Clear and grub Runway 18 runway protection zone (40 acres). Install obstruction lighting on Hangar 6.
g. Noise Mitigation	**(1)** The type of noise mitigation (such as residential soundproofing, school soundproofing, blast fence). **(2)** The associated noise contour, if applicable. **(3)** If known, the number of houses/schools or people/students affected.	Provide residential sound insulation (approximately 20 residences) in the DNL 70 dB. Sound insulate Roosevelt High School (230 students) in the DNL 65 dB.
h. State Block Grant (No Discretionary)	**(1)** If the ADO chooses to write the grant for a specific project or projects, the appropriate information for that project. **(2)** If the grant will not be project specific, a general statement is appropriate.	**For a project specific grants:** See above examples. **For non-project specific grants**: Various airport developments under the State Block Grant Program.

e. Special Conditions. Special conditions highlight extra steps the sponsor must take as part of accepting the grant offer and included in the actual grant document. Special conditions are tailored to the type of project, special sponsor circumstances, and/or unique situations and are binding as part of the grant agreement. The automated AIP system contains the current available special conditions. If the ADO determines that an additional special condition is needed, the ADO must receive APP-520 approval to include the special condition in the grant. If appropriate, APP-520 has the option to amend the special condition list to include this additional special condition in the list of special conditions.

f. Grant Assurances. The requirements for the grant assurances are listed in Paragraph 2-4.

g. Sponsor Certifications. 49 USC § 47105(d) allows the FAA to require sponsors to certify that they will comply with statutory and administrative requirements in carrying out an AIP funded project. There are eight certifications as shown in Table 5-11 (see the AIP Forms link in Appendix B). Certifications are considered to be part of the Grant Package.

(1) Sponsor Certification History. It is FAA policy that the sponsor has primary responsibility for complying with AIP requirements.

(2) Sponsor Certification Purpose. The grant agreement and the associated grant assurances are the official, legal-binding documents that obligate the sponsor to AIP policies, regulations and standards. The sponsor's certifications are an additional measure used by the ADO to focus a sponsor's attention on certain grant obligations. These certifications are intended to enhance a sponsor's knowledge and ensure their compliance with the grant obligations.

(3) Sponsor Certification Timing. Per FAA policy, all applicable certifications must be signed by the sponsor on or before the date the sponsor signs the associated grant agreement offer. The ADO normally accomplishes this by sending the applicable sponsor certifications with the grant agreement offer. The ADO has the option of requesting these sponsor certifications at an earlier date, for instance, at the same time as the grant application. If the ADO believes changes have occurred on the project that may affect the sponsor certification on file, the ADO has the option to require the Sponsor re-submit a certification form when it completes the applicable actions that pertain to a specific certification statement. For example, the ADO has the option to require resubmittal of the Construction Project Final Acceptance certification as part of the closeout submittal for the project.

(4) FAA Sponsor Certification Responsibility. The ADO retains the responsibility of maintaining a broad overview of AIP projects and being reasonably assured that the sponsor is meeting all of its obligations. The ADO's acceptance of a sponsor certification does not limit the ADO from reviewing the appropriate documentation to validate the certification.

(5) False Sponsor Certification. If the ADO determines that the sponsor has not adhered to the certifications, the ADO must review the associated project costs to determine if the costs are still allowable under AIP. In addition, if the sponsor knowingly makes false statements, further penalties may apply under 49 USC § 47126.

(6) Items Specifically Not Covered by Sponsor Certification. The use of sponsor certifications is limited. Table 5-12 contains examples of Federal actions that cannot be covered by sponsor certification.

Table 5-11 Summary of Sponsor Certifications

The following document…	Requires the sponsor to…
a. FAA Form 5100-134, Selection of Consultants	Certify that they have properly followed or will properly follow key consultation selection requirements.
b. FAA Form 5100-132, Project Plans and Specifications	Certify that they have or will prepare the plans and specifications in accordance with key requirements.
c. FAA Form 5100-131, Equipment/Construction Contracts	Certify that they have properly followed or will properly follow key Federal procurement requirements.
d. FAA Form 5100-133, Real Property Acquisition	Certify that they have properly followed or will properly follow key land acquisition requirements.
e. FAA Form 5100-129, Construction Project Final Acceptance	Certify that they have or will complete key requirements prior to final project acceptance.
f. FAA Form 5100-130, Drug-Free Work Place	Certify that the work place will be drug-free as required under the Drug-Free Work Place Act of 1998 and 49 CFR part 32.
g. FAA Form 5100-135, Certification and Disclosure Regarding Potential Conflict of Interests	Certify that there are no conflicts of interest to the FAA or to the state (for state block grant subrecipients). The new requirement for this certification is contained in 2 CFR § 200.112 and became effective for AIP on December 19, 2014. Per FAA policy, this is accomplished by the sponsor completing a Conflict of Interest certification.
h. Certification Regarding Lobbying	Certify that no federally appropriated funds have been used to influence a federal employee or member of Congress in connection with the grant. Further details of requirements are found in Appendix A to 49 CFR part 20. Note that for AIP purposes, this is not a separate certification. This certification has been rolled into the grant application forms.

Table 5-12 Examples of Actions Specifically Excluded from Sponsor Certification

Some examples of inappropriate actions for sponsor certification…
a. Review of projects for inclusion in the NPIAS.
b. Entry or deletion of airports from the NPIAS.
c. Determination of AIP eligibility or justification.
d. Review of impacts to the National Airspace System architecture.
e. Review and approval of modifications to standards.
f. Review and approval of aeronautical study.
g. Designation of instrument runways.
h. Determination of AIP project cost reasonableness.
i. Disadvantaged Business Enterprise program approval (this is the responsibility of the FAA Office of Civil Rights (ACR)).
j. Approval of environmental studies.
k. Approval of airport layout plans.
l. Review and approval of construction safety phasing plans.
m. Review and approval of various safety determinations (such as compliance with 14 CFR part 139 requirements and airfield safety determinations by Flight Standards).
n. Issuing waivers to the Buy American Preference requirements.
o. Review and approval of Project Labor Agreements.

h. Advisory Circular List. The FAA publishes a list of certain advisory circulars that set out the applicable policies, standards, and specifications that sponsors must carry out on an AIP funded project. The ADO includes this list directly in the grant agreement, which officially incorporates it as part of the grant conditions. This list, FAA Advisory Circulars Required for use in AIP Funded and PFC Approved Projects, is available online (see Appendix B for link).

i. Applicable State Agency Agreements. Some grants must be cosigned by the state agency. In these cases, the ADO must obtain the state agency agreement with the sponsor and retain this documentation in the ADO office files.

j. The Entire Grant Application. The requirements for the grant application are listed in Paragraph 5-19.

5-23. Grant Acceptance.

If the sponsor(s) agrees with the grant offer, the steps and requirements for the sponsor(s) to accept the grant offer are included in Table 5-13. Once the ADO receives a copy of the executed grant, the ADO must record that the grant was signed by the sponsor(s) in the automated AIP system. The ADO has the option of printing the FAA Form 5100-107, Airport Improvement Program Form (also called AIP Grant Status Report) generated by the automated AIP system and placing the form in the file. However, this is not mandatory because a current version of the form containing the grant history is retained in the automated AIP system.

Table 5-13 Steps and Requirements for Sponsor Grant Acceptance

The steps and requirements include…	
a.	The sponsor(s) cannot alter the grant agreement. The grant agreement can only be changed by a grant amendment issued by the ADO.
b.	The sponsor(s) must sign the grant in one of the two sponsor signature locations.
c.	If the sponsor(s) signs where a notary is required, the notary must sign and stamp (or seal) the grant at the same time. Therefore, the notary date must be the same date as the sponsor signature date.
d.	Each sponsor's attorney must sign the grant agreement after the sponsor. Therefore, the attorney's signature date must be on or after the sponsor's signature date.
e.	The sponsor(s) must keep one original executed grant agreement for its files and send the remaining executed grant(s) back to the ADO by the date required by the ADO.

5-24. The FAA Office of Finance and Management, FAA Accounts Payable Section B (AMK-314) Notification.

The ADO must send the pages of the grant offer that contain the grant description, grant amount, and signatures to AMK-314.

Section 5. ADO Grant Oversight.

5-25. ADO Oversight (and Required Sponsor Documentation) Based on Sponsor Risk Level.

Based on a DOT Office of Inspector General (OIG) audit and findings related to the FAA's administration of AIP, the FAA has implemented a risked base oversight system to minimize the risk of misuse of funds by sponsors. The FAA uses a tiered ranking system to assign a risk level

to each sponsor. The risk level defines the level of oversight required by the ADO and lists the sponsor documentation that the ADO must retain in the grant file. Current detailed guidance on how to assign sponsor risk levels and the associated oversight requirements is contained in the Airport Improvement Program (AIP) Grant Oversight Risk Model Policy(see Appendix B for link).

5-26. Requirement to Include a Copy of FAA Determinations in the Grant File.

If a written ADO determination is required by this Handbook or other FAA policy, the ADO must include a copy in the associated grant file. The ADO also has the option of adding a reference to the grant file of the location (physical or electronic) of the written determination instead of including a written copy in the grant file. The reference must be specific enough for authorized personnel to readily find the document.

5-27. Statutory Requirement for ADO Project Oversight.

AIP is a grant program, and under 31 USC § 6304 and § 6305 (Federal Grant and Cooperative Agreement Act of 1977) Federal agencies must use a grant agreement, rather than a cooperative agreement when limited involvement between the sponsor and the Federal government is expected. ADO involvement in an AIP project is generally limited to the oversight necessary to protect the Federal interests as specified in 31 USC § 6304.

In addition to the other ADO oversight requirements listed throughout this Handbook, the ADO has the following oversight requirements and options during the life of the project.

5-28. Safety Risk Management (SRM) Panels.

ADOs must participate in safety risk management panels associated with the project when it is required by a triggering action listed in the current version of FAA Order 5200.11, FAA Airports (ARP) Safety Management System. There is a separate tracking system for SRM, therefore the ADO is not required to document the ADO's participation in the grant file.

5-29. Construction Safety Phasing Plans.

The current version of Advisory Circular 150/5370-2, Operational Safety on Airports during Construction, outlines when a sponsor is required to submit a construction safety phasing plan. The ADO must review and approve or disapprove all required construction safety phasing plans in writing. This ADO responsibility cannot be delegated and is not covered by sponsor certification.

5-30. Predesign, Prebid, and Preconstruction Conferences.

Sponsors have the option to hold predesign, prebid, and preconstruction as discussed in the current version of Advisory Circular 150/5370-12, Quality Management for Federally Funded Airport Construction Projects. The ADO has the option to participate in these conferences.

5-31. Equipment Photographs.

The ADO has the option to require a sponsor to submit a picture of the actual delivered equipment unless the sponsor's risk level makes submitting a photograph mandatory. The ADO must file any submitted photographs in the grant file.

5-32. Construction Photographs.

The ADO has the option to require a sponsor to submit pictures of the project site before, during, and/or after a construction project unless the sponsor's risk level makes submitting a photograph mandatory. The ADO must file any submitted photographs in the grant file.

5-33. Construction Management Programs.

In 1990, the FAA enacted a construction management plan policy for projects with a total pavement construction contract value over $250,000 to satisfy an DOT Office of Inspector General (OIG) Audit on Airport Construction Materials Conformance finding. The FAA has since raised the dollar value to $500,000. It is FAA policy that a sponsor must submit a construction management program to the ADO prior to the start of construction for projects with a total pavement construction contract value over $500,000. The pavement construction contract value is calculated by totaling the costs of the total pavement structure (including subgrade, base and subbase courses, and surface course). If these costs exceed $500,000, a construction management program is required.

When construction of a project requiring a construction management program is complete, the sponsor is required to submit a summary of the quality assurance test results and the disposition of any problem test results.

The ADO has the option of requiring the sponsor to provide the plan for lower dollar value pavement projects. The ADO also has the option to review and/or comment on the construction management program.

The ADO must place a copy of the construction management program, the summary of the quality assurance test results, and a copy of the ADO comments (if applicable) in the grant file.

5-34. Notices to Proceed.

Once all contract documents have been executed, the sponsor will issue a notice to proceed to the contractor. The sponsor must send a copy of the notice to proceed to the ADO if requested by the ADO.

5-35. Change Orders, Supplemental Agreements, and Contract Modifications.

Sponsors have the option to change contracts through change orders, supplemental agreements, and contract modifications as discussed in Table 5-14.

All change orders, supplemental agreements, and contract modifications must eventually be reviewed by the ADO. This is because these actions are considered noncompetitive proposals

per 2 CFR § 200.320(f) (see Paragraph U-18). The notification, submittal, and determination documentation requirements vary as discussed in Table 5-15. As discussed in Paragraph 3-101, the Simplified Acquisition Threshold exception does not apply to change orders, supplemental agreements, and contract modifications.

Unless specifically requested by the ADO, the sponsor does not have to obtain prior ADO approval for contract changes. However, if a sponsor proceeds with a contract change without FAA prior approval, it is at the sponsor's risk. The ADO review at a later date could determine that the costs in the contract change cannot be paid for under the grant. Sponsors have the option to request prior ADO review of contract changes.

The exception is if the change order includes steel or manufactured goods that are less than 100% domestic materials. In this case, each change order requires separate Buy American review by the ADO before the sponsor proceeds with the change order.

The ADO cannot approve costs that the ADO has determined are due to errors and omissions in the plans and specifications that were foreseeable at the project design. In addition, the ADO must only approve costs that are directly necessary to accomplish the project. Examples of change orders that the ADO can approve and cannot approve are discussed in Table 5-16. Examples of changes to professional services agreements that the ADO can approve and cannot approve are discussed in Table 5-17.

Table 5-14 Types of Contract Changes

For the following type of contract…	The following types of contract changes are used…	And guidance is contained in the current version of…
a. Construction and equipment contracts	Change orders or supplemental agreements	The current version of Advisory Circular 150/5370-10, Standards for Specifying Construction of Airports
b. Negotiated professional service agreements	Contract modifications or supplemental agreements	The current version of Advisory Circular 150/5100-14, Architectural, Engineering, and Planning Consultant Services for Airport Grant Projects

Table 5-15 Sponsor and ADO Requirements for Contract Changes

If the sponsor proposes to…	The sponsor must…	And the ADO…
a. Execute change orders, supplemental agreements, and contract modifications	**(1)** Conduct a cost analysis. Paragraph U-21 contains guidance to sponsors on how to perform price and cost analyses. **(2)** If there is a change in scope, notify the ADO. Otherwise notify the ADO upon ADO request. **(3)** If requested by the ADO, submit the following documentation: **(a)** Change order or supplemental agreement. **(a)** Justification for the change. **(b)** A statement signed by the sponsor that the cost analysis was performed that includes the sponsor's recommendation that the FAA accept the statement and analysis as evidence of cost reasonableness. **(c)** Any other support documentation requested by the ADO.	Has the option to request that the sponsor submit associated documentation. Has the option to conduct a pre-award review. Has the option, if the ADO chooses to conduct a review, to provide the sponsor with a written response containing the ADO finding and/or keep a copy available for future reference.
b. Request a grant amendment	**(1)** Have conducted a cost analyses for all change orders, supplemental agreements, and contract modifications. Paragraph U-21 contains guidance to sponsors on how to perform price and cost analyses. **(2)** Submit (or have submitted) the following documentation: **(a)** All associated change orders, supplemental agreements, and contract modifications. **(b)** Justification for the changes. **(c)** A statement signed by the sponsor that a cost analysis was performed for all change orders, supplemental agreements, and contract modifications that includes the sponsor's recommendation that the FAA accept the statement and analysis as evidence of cost reasonableness. **(d)** Any other support documentation requested by the ADO.	Must review the project costs to ensure that *all* of the requirements in Chapter 3 have been met, including cost reasonableness. By signing the grant amendment, the ADO is documenting that the associated project costs in the amendment meet the requirements in Chapter 3.

Table 5-15 Sponsor and ADO Requirements for Contract Changes

If the sponsor proposes to…	The sponsor must…	And the ADO…
c. Submit the grant closeout package	**(1)** Have conducted a cost analyses for all change orders, supplemental agreements, and contract modifications. Paragraph U-21 contains guidance to sponsors on how to perform price and cost analyses. **(2)** Submit (or have submitted) the following documentation: **(a)** All associated change orders, supplemental agreements, and contract modifications. **(b)** Justification for the changes. **(c)** A statement (or statements) signed by the sponsor that a cost analysis was performed for all change orders, supplemental agreements, and contract modifications that includes the sponsor's recommendation that the FAA accept the statement and analysis as evidence of cost reasonableness. **(d)** Any other support documentation requested by the ADO.	Must review the project costs to ensure that all of the requirements in Chapter 3 have been met, including cost reasonableness. By signing the FAA final project report, the ADO is documenting that the final project costs in the grant meet the requirements in Chapter 3.

Table 5-16 Examples of Change Orders that Can and Cannot be Approved by the ADO for AIP Participation

For the following change order…	The ADO…
a. To revise quantities of items to reflect actual quantities used for the project.	Has the option to approve the request for adjustment (increase/decrease) in construction cost.
b. To address differing site conditions or materials that were *not* found during the site investigation.	Has the option to approve the request.
c. To remove subsurface materials *that were shown* in the soil borings taken during the site investigation.	Has the option to approve the request. Even though this work must be accomplished to finish the project, the existing field condition was readily apparent but was overlooked. (The difference between this and the preceding entry is that while the construction costs may be allowable, the costs to redesign are not allowable as discussed in the next table.)

Table 5-16 Examples of Change Orders that Can and Cannot be Approved by the ADO for AIP Participation

For the following change order…	The ADO…
d. To make changes in a terminal building using the proration that was used to determine initial AIP participation.	Must not approve the request unless the ADO has determined that the initial AIP proration is valid for the work included in the change order. If the initial AIP proration is not valid, the ADO must not approve the change order until the change order amount is calculated based on actual cost information.
e. For construction costs to add work outside of the grant description.	Must not approve the request unless the ADO has coordinated the steps needed to add work to a project.

Table 5-17 Examples of Changes to Professional Services Agreements that Can and Cannot be Approved by the ADO for AIP Participation

For the following request…	The ADO…
a. To revise contract documents to rebid a package because of a bid protest that was upheld by the ADO.	Must not approve the request.
b. To revise contract documents because the project specifications were deficient. This includes failure to use FAA standards, unapproved modifications, unduly restrictive requirements.	Must not approve the request.
c. To rebid a project as a result of a non-competitive bid environment or high bids due to factors outside of the sponsor's control.	Has the option to approve the request for additional professional services fees provided the sponsor's actions were not the cause of the non-competitive environment or high bids.
d. To address, via redesign, differing site conditions or materials that were *not* found during the site investigation.	Has the option to approve the request.
e. To address, via redesign, the removal of subsurface materials *that were shown i*n the soil borings taken during the site investigation.	Must not approve the request. Even though this work must be accomplished to finish the project, and the construction costs may be allowable, the existing field condition was readily apparent but was overlooked during the design phase. (The difference between this and the preceding entry is that while the construction costs may be allowable, the costs to redesign are not allowable.)
f. To add work outside of the grant description.	Must not approve the request unless the ADO has coordinated the steps needed to add work to a project.

5-36. Periodic Inspections.

The ADO has the option of conducting periodic inspections of the worksite.

5-37. Construction Progress and Inspection Report.

Per the current version of Advisory Circular 150/5370-12, Quality Management for Federally Funded Airport Construction Projects, the sponsor's engineer must complete FAA Form 5370-1, Construction Progress and Inspection Report, or the equivalent for all AIP funded construction projects. The sponsor must submit the requested reports to the ADO at least quarterly (or more frequently at the ADO's request).

5-38. Meetings for Planning and Environmental Study Grants.

Sponsors (and sometimes the ADO) are often required to hold meetings in association with planning and environmental study grants. The ADO has the option of attending these meetings unless otherwise required by an FAA order or other FAA policy. For instance, the current version of FAA Order 5050.4, National Environmental Policy Act (NEPA) Implementing Instructions for Airport Projects, requires that the ADO not only attend required EIS meetings (not optional), but also organize and lead the meetings. The specific requirements for these meetings are discussed in the current versions of the following documents.

a. Advisory Circular 150/5070-7, The Airport System Planning Process

b. Advisory Circular 150/5070-6, Airport Master Plans

c. FAA Order 5050.4, National Environmental Policy Act (NEPA) Implementing Instructions for Airport Projects

5-39. Forecasts in Planning or Environmental Projects.

If the grant contains planning or environmental projects that require forecasts, the sponsor is required to submit the forecast to the ADO. The ADO must approve or disapprove the forecast before it is used as part of the project. This ADO responsibility cannot be delegated and is not covered by sponsor certification.

5-40. Performance Report (formerly called Quarterly Performance Report).

2 CFR § 200.328 requires sponsors of Federal grants to submit performance reports. Table 5-18 provides the performance report requirements for AIP projects by project type. Note that this performance reporting provides project schedule and dates, and is not the same thing as the Standard Form 425, Federal Financial Report.

Table 5-18 Performance Report Requirements by Project Type

For the following type of project…	The FAA policy is…
a. Non-construction	**(1)** Per 2 CFR § 200.328, the sponsor must submit FAA Form 5100-140, Performance Report (see the AIP Forms link in Appendix B) at least annually, but not more than quarterly, until the non-construction project is completed. The ADO has the option of requiring the performance report quarterly. **(2)** The sponsor must submit each performance report within 30 days of the end of quarter if required quarterly or semiannually; and within 90 days of the end of the fiscal year if required annually. Sponsors must not submit the performance reports in batches or at the end of the project. **(3)** If a major project or schedule change occurs between performance reports, the sponsor must submit an out of cycle performance report to the ADO. **(4)** Guidance on the current ADO review requirements is contained in the Airport Improvement Program (AIP) Grant Payment and Sponsor Financial Reporting Policy (see Appendix B for link).
b. Construction	**(1)** The FAA has determined that sponsor submittal of FAA Form 5370-1, Construction Progress and Inspection Report, satisfies the performance reporting requirement. **(2)** FAA Form 5370-1 (see the AIP Forms link in Appendix B) is discussed in more detail in the current version of Advisory Circular 150/5370-12, Quality Management for Federally Funded Airport Construction Projects. **(3)** 2 CFR § 200.328 establishes general reliance on inspection reports and certified percentage of completion for Federal monitoring of construction project status. Per FAA policy, the sponsor must submit FAA Form 5370-1 to the ADO at least quarterly, however, the ADO has the option to require the sponsor submit these reports on a more frequent basis. Per FAA policy, the quarterly frequency for this report will generally provide adequate ADO monitoring for construction projects. **(4)** The sponsor must submit FAA Form 5370-1 to the ADO for each fiscal quarter until the construction project is completed. **(5)** The sponsor must submit each FAA Form 5370-1 within 30 days of the end of the quarter (not in batches or at the end of the project). **(6)** The sponsor must include the certified percentage-of-completion information on FAA Form 5370-1. If not, the ADO must require the sponsor to resubmit the form with this information. **(7)** If a major project or schedule change occurs between the reporting cycles, the sponsor must submit an out of cycle FAA Form 5370-1 to the ADO. **(8)** Guidance on the current ADO review requirements is contained in the Airport Improvement Program (AIP) Grant Payment and Sponsor Financial Reporting Policy (see Appendix B for link).

5-41. Annual Reporting of Residential Population Benefits.

The ADO must report the residents and students that benefit from noise compatibility projects. This reporting is done on a yearly basis by APP-400 with the assistance of the regional offices and ADOs.

5-42. Final Inspection.

For construction projects, the sponsor must provide the ADO with documentation confirming that the project was completed in accordance with the terms and conditions of the contract(s). The ADO must include a copy of this documentation in the grant file.

The ADO has the option of attending the final inspection. If the ADO does not attend the final inspection, then the ADO has the option to rely on the sponsor Construction Project Final Acceptance certification and the sponsor final inspection report as confirmation that the work has been completed in accordance with the approved plans and specifications.

Section 6. Grant Payments.

5-43. Summary of Payment Request Requirements and Limitations.

The requirements and limitations for grant payment requests are summarized in Table 5-19. These items are discussed in more detail in the following paragraphs.

Table 5-19 Grant Payment Request Requirements and Limitations

The grant payment requirements and limitations include…	
a.	The sponsor and ADO must process all grant payment requests through the currently approved Department of Transportation (DOT) grant payment system unless otherwise approved by the ADO.
b.	The sponsor must submit payment requests at least annually unless the ADO requires more frequent payment requests.
c.	The sponsor must base payment requests on costs incurred (based upon invoices, billing statements, or other appropriated payment support provided to the ADO by the sponsor).
d.	The ADO must not approve any payment requests for the last 10% of the Federal share of the grant (or the last 10% of the estimated Federal share of the grant after amendment, whichever is less) unless the requirements in Paragraph 5-46 are met. The ADO has the option of excluding a state block grant from this requirement only if the state is following this requirement for all of the subgrants within the state block grant and the ADO is confident that the state will submit the state block grant closeout documentation in a timely manner.
e.	The ADO is allowed to determine the timing and amount of the payment and may reduce or withhold the payment if the ADO follows the applicable requirements.

Table 5-19 Grant Payment Request Requirements and Limitations

The grant payment requirements and limitations include…
f. The sponsor must stay within the contract retainage limitations.
g. The sponsor must stay within the disputed cost limitations.
h. The sponsor must stay within the land acquisition cost limitations.
i. The sponsor must not request a payment that is improper.
j. The sponsor must document and/or report their payment requests on) the following forms (see the AIP Forms link in Appendix B) as required in the Airport Improvement Program (AIP) Grant Payment and Sponsor Financial Reporting Policy (see Appendix B for link). **(1)** Standard Form 425, Federal Financial Report. **(2)** Standard Form 271, Outlay Report and Request for Reimbursement for Construction Programs (or ADO approved equivalent) or Standard Form 270, Request for Advance or Reimbursement (for non-construction projects in lieu of Standard Form 271or ADO approved equivalent).
k. The sponsor must maintain all of the documentation supporting the grant payment for the required time period and must make this information available upon request.

5-44. Requirements and Process for Using the Current DOT Electronic Payment System.

a. Sponsor Payment Requests. Sponsors must submit all grant payment requests and related supporting documentation electronically through the currently approved Department of Transportation grant payment system. Sponsors that are unable to use the DOT system must submit a waiver request to the ADO for review by the DOT. Guidance and help desk contact information for the current DOT electronic payment system is available on the FAA Office of Airports website (see AIP Grant Payments link in Appendix B). Note that it is the sponsor's responsibility to keep their banking information up to date.

b. ADO Payment Approval. The sponsor's risk level determines the level of payment review required by the ADO within the currently approved DOT grant payment system. Current detailed guidance on ADO review responsibilities and how the ADO is to use the electronic system is contained in the Airport Improvement Program (AIP) Grant Payment and Sponsor Financial Reporting Policy (see Appendix B for link).

c. Method of Payments. Once ADO and AMK-314 approve the payment request, AMK-314 will request the U.S. Treasury to transfer funds to the sponsor's bank through an electronic funds transfer. If a sponsor requires a Treasury check, the sponsor must work with AMK-314 to determine the process.

5-45. Requirements for Frequency of Payment Requests and Expenditure Rate.

Per 2 CFR § 200.400, the sponsor must efficiently and effectively administer the grant by applying sound management practices. In addition, 49 USC § 47106(a)(4) requires that a project be completed without unreasonable delay. The ADO ensures compliance with these requirement by monitoring Performance Reports as required in Paragraph 5-40 and ensuring that regular grant payments are being made to support project accomplishments.

a. Frequency of Sponsor's Payment Requests. Per FAA policy, sponsors must submit payment requests at least every twelve months starting from the date of the grant acceptance. An ADO also has the option to require the sponsor to submit payment request as often as every three months (quarterly). This mirrors the financial reporting frequency provided in 2 CFR § 200.327. This does not limit the sponsor from submitting payment requests more frequently than every three months.

b. Requirements for Payment Request Frequencies Exceeding 12 Months. If a sponsor has not submitted a payment request for more than 12 months, it is FAA policy that the ADO must notify the sponsor in writing of this delinquency and request the sponsor to submit a payment request or, if applicable, close the grant. If the sponsor is unable to submit a payment request or close the grant, the sponsor must provide the ADO with the reason for the delay and the sponsor's proposed resolution. If the ADO finds the reason for the delay or the proposed resolution unacceptable, the ADO has the option to suspend the grant as outlined in Section 9 of this chapter and/or, upon further coordination with ACO-100, delay issuing any future grants to the sponsor until the issue is resolved.

c. Expenditure Rate. If the sponsor is drawing down the grant funding at a pace that is not consistent with the project progress or completing the project in a timely manner, the ADO has the option of asking the sponsor to submit the reason for the delay and the proposed resolution to the ADO in writing. If the ADO finds the reason for the delay or the proposed resolution unacceptable, the ADO has the option to suspend/terminate the grant as outlined in Section 9 of this chapter and/or, upon further coordination with ACO-100, delay issuing any future grants to the sponsor until the issue is resolved.

5-46. Requirements for Approving Payment within the Last 10% of the Federal Share.

Per 49 USC § 47111, no more than 90% of the Federal share of a project's estimated allowable costs may be made before the project is complete. The language in this section of the statute has been misinterpreted in the past to only apply to advance payments. The intent and origination of this language has been researched by the FAA, and it has been determined that this requirement applies to all types of payment requests, not just advance payments.

Per FAA policy, the ADO has the option to approve payment requests for a portion of the remaining 10% for a project that the ADO determines meets all of the requirements in the latest version of the Airport Improvement Program (AIP) Grant Payment and Sponsor Financial Reporting Policy (see Appendix B for link).

5-47. Requirements for Payment Requests to be Based on Incurred Costs.

Per 2 CFR § 200.305, the advance payment method is the standard method used by the Federal government to pay a sponsor. In order for an ADO to allow a sponsor to be paid in this manner, the sponsor must meet the conditions in Table 5-20.

When a sponsor is not able to satisfy the advance payment method requirements in Table 5-20, then the ADO must require the sponsor to submit payment requests under the reimbursement method. The ADO must document the reasons a sponsor has been placed on the reimbursement method of payment in the sponsor's file. The ADO has the option to revisit this decision if conditions with the sponsor change that may warrant the sponsor returning to the advance payment method.

If the FAA has determined that the sponsor lacks sufficient working capital to even operate on an advance payment basis, 2 CFR § 200.305(b)(4) allows sponsors to request cash advances prior to receiving invoices and billing statements. Under this procedure, the FAA advances cash payments to the sponsor to cover its initial capital start up needs for the grant. After this initial advancement(s), normal payment requirements apply. This is a very unusual situation requiring adequate justification, and APP-520 must approve or disapprove all requests of this nature.

Table 5-20 Conditions the Sponsor Must Meet for Advance Payments

The following conditions must be met for a sponsor to receive advance payments…
a. The Advance Payment Request is Based on Invoices and Billing Statements. Per FAA policy, the sponsor must provide documentation showing that the advance payment is based upon invoices, billing statements, or other appropriated payment support. For direct or indirect sponsor costs such as administrative costs, force account costs, or costs not supported by a contract, the sponsor must be able to provide documentation that supports the amount and validity of the cost. This ensures that the advance payment is based upon *defined* costs as opposed to *estimated* amounts.
b. The Sponsor Provides Prompt Payment to the Vendor. Per 2 CFR § 200.305(b)(1), the sponsor must maintain or demonstrate the willingness to maintain both written procedures that minimize the time elapsing between the transfer of funds and disbursement by the non-Federal entity, and financial management systems that meet the standards for fund control and accountability.
c. The Sponsor Meets Payment Requirements in Their Contracts and in Local/State Law. Per FAA policy, the sponsor must not withhold payment from their vendors beyond the time frame addressed in their contract or by local and state law, regardless of the timing of the grant or advance payment.

5-48. Requirements for Reducing or Withholding Payments.

Under 49 USC § 47111, the ADO is allowed to decide when and in what amounts payments under the grant may be made. The unique situations where the ADO would reduce or withhold a sponsor payment request are discussed in Table 5-21.

Table 5-21 Situations Where an ADO Would Reduce or Withhold a Sponsor Payment Request

For the ADO to…	The ADO must…
a. Approve less than the sponsor payment request due to unallowable, unreasonable, or unjustified costs	**(1)** Determine that the payment request contains unallowable, unreasonable, or unjustified costs. **(2)** Notify the sponsor of the adjusted amount and the reason behind the adjustment. **(3)** Reject the payment back to the sponsor and require the payment to be resubmitted.
b. Withhold a sponsor payment request pending satisfactory backup	**(1)** Determine that there is insufficient information in the payment request for the ADO to determine the reasonableness, allowability, and necessity of the claimed costs. **(2)** Reject the payment back to the sponsor and require the payment to be resubmitted.
c. Withhold a sponsor payment request from a sponsor who is indebted to the U.S. Government	**(1)** Have been notified by the FAA Office of Finance and Management, FAA Accounts Payable Section B (AMK-314) that the sponsor owes money to a Federal agency. **(2)** Determine if withholding payments will significantly impact the progress on the AIP project. **(3)** Notify the sponsor of the indebtedness and request documentation of resolution. **(4)** Reject the payment back to the sponsor and require the payment to be resubmitted once the indebtedness has been resolved.
d. Withhold payment requests for a sponsor in noncompliance with a grant assurance (or other egregious violation)	**(1)** Have been notified by ACO-100 that ACO-100 has found the sponsor to be in noncompliance with a grant assurance (or other egregious violation). **(2)** Coordinate with ACO-100 to determine whether to withhold payments. **(3)** Not withhold payment for proper charges for more than 180 days unless the sponsor has been notified and given an opportunity for a hearing (if required by either 49 USC § 47106(d) or 47111) and ACO-100 concurs with this action.

5-49. Limitations for Contract Retainage.

The current version of Advisory Circular 150/5370-10, Standards for Specifying Construction of Airports, allows a sponsor to retain a percentage of a contractor's invoices until the contractor satisfactorily completes the work. A summary of these retainage requirements and the associated limitations for the sponsor to include them in payment request is included in Table 5-22.

Table 5-22 Contract Retainage Limitations

If the sponsor opts to…	The sponsor is required to…	And the sponsor's payment request…
a. Hold retainage, but not in an escrow account.	**(1)** Include a clause in the contract obligating prime contractors to make prompt and full payment of any retainage to their subcontractors. **(2)** Ensure that the retainage percentage that the prime contractor sets for the subcontractor does not exceed the retainage percentage the sponsor sets for the prime contractor. **(3)** Ensure prompt and full payment of retainage from the prime contractor to the subcontractor within 30 days after the subcontractor's work is satisfactorily completed (as required in 49 CFR § 26.29).	Must not include the retainage amount. This is because the sponsor does not incur a cost when withholding retainage. The sponsor incurs the cost when retainage is released.
b. Hold retainage in an escrow account	**(1)** Include a clause in the contract obligating prime contractors to make prompt and full payment of any retainage to their subcontractors. **(2)** Ensure that the retainage percentage that the prime contractor sets for the subcontractor does not exceed the retainage percentage the sponsor sets for the prime contractor. **(3)** Ensure prompt and full payment of retainage from the prime contractor to the subcontractor within 30 days after the subcontractor's work is satisfactorily completed (as required in 49 CFR § 26.29).	May include the retainage amount. This is because the sponsor is responsible for paying these costs and does so by placing the retainage in an escrow account.
c. Not hold retainage	**(1)** Ensure that the prime contractor does not set a retainage percentage for the subcontractor. **(2)** Require a contract clause obligating prime contractors to make prompt and full payment of any retainage kept by prime contractor to the subcontractor within 30 days after the subcontractor's work is satisfactorily completed.	Must not deduct a retainage amount from the payment request. All costs are based on actual paid costs.

5-50. Limitations for Contractor Disputed Costs.

When the sponsor and the contractor do not agree on the amount owed to the contractor, and the dispute is likely to go to court, the sponsor is still allowed to submit a payment request for any undisputed costs.

5-51. Limitations for Land Acquisition Costs.

It is FAA policy that costs associated with a land acquisition (such as cost of land, appraisals, legal fees, etc.) are not allowable until *after* the sponsor has submitted evidence satisfactory to the ADO that the sponsor will receive good title to land. The sponsor must submit a binding purchase agreement that will convey good title, evidence of a condemnation deposit, a condemnation award, or a court settlement. Until the sponsor meets this requirement, there is no guarantee that the land acquisition will be completed. Therefore, sponsors must not submit payment requests until these conditions are met.

5-52. Requirements for Avoiding Improper Payments.

a. Background, Definition, and Examples. The Improper Payments Elimination and Recovery Improvement Act of 2012 (Public Law 112-248) outlines Federal requirements regarding improper payments. An improper payment occurs when the funds go to the wrong sponsor, the sponsor receives an incorrect amount of funds, or the sponsor uses the funds in an improper manner. Sponsors must avoid requesting and the ADO must avoid approving improper payments. Examples of improper payments are listed in Table 5-23

Table 5-23 Examples of Improper Payments

Some examples include payments that are made…
a. To the wrong AIP sponsor.
b. To an ineligible sponsor.
c. To the wrong AIP grant.
d. For an ineligible or unallowable work (see Chapter 3 for requirements).
e. That duplicates previous payments.
f. For costs that have not been paid (unless the ADO has approved an advance payment).
g. For an incorrect amount (either over or under the correct amount).
h. Where the sponsor cannot provide documentation to support that the payment was made correctly.

b. Identification and Remediation of Improper Payments. Improper payments may be identified through a number of avenues. This may include audits under the Single Audit Act, by the DOT Office of Inspector General (OIG), by state or local authorities, by the U.S. General Accountability Office. Improper payments may also be identified by the ADO or the sponsor. In all cases, the ADO must take action as outlined in Table 5-24 and the sponsor must take action as outlined in Table 5-25.

c. Costs Incurred to Recover Improper Payments. By FAA policy, the costs incurred by a recipient to recover improper payments are not allowable as either direct or indirect costs.

Table 5-24 ADO Remediation Actions for Improper Payments

The ADO must…
a. Notify the OIG if the ADO has reason to believe the improper payment was a deliberate attempt to defraud the FAA. The OIG hotline may be used for this purpose (see Appendix B for link).
b. Notify the sponsor in writing of the improper payment, including a description of the error or problem that was found (unless otherwise directed by the OIG).
c. Work with the sponsor to determine how the error or problem will be corrected (unless otherwise directed by the OIG).
d. Document the steps that will be taken to resolve the improper payment and include the documentation in the grant file.

Table 5-25 Sponsor Remediation Actions for Improper Payments

If the sponsor…	The sponsor must…
a. Has not received the payment.	Withdraw and resubmit the payment request that contains the improper payment.
b. Has received the payment.	Per 31 CFR § 901.2(b)(3), pay the improper payment within 30 days of the initial ADO notification using the established process for returning AIP funds electronically through the currently approved Department of Transportation grant payment system. Any alternate forms of returning funds to the FAA must be coordinated with the ADO and the FAA Office of Finance and Management, FAA Accounts Payable Section B (AMK-314).

5-53. Requirements for Financial Reporting (Standard Forms 425, 271, and 270).

Sponsors are required to submit certain financial reports to summarize grant expenditures and the status of project funds. Sponsors must submit the following financial reporting forms as required in the current version of Airport Improvement Program (AIP) Grant Payment and Sponsor Financial Reporting Policy (see Appendix B for link). The forms are also available on this website (see the AIP Forms link in Appendix B). 2 CFR § 200.327 requires sponsors to report at least annually, but not more than quarterly.

a. Standard Form 425, Federal Financial Report, or ADO approved equivalent (see the AIP Forms link in Appendix B). This requirement is found in 75 Federal Register 54215 (September 3, 2010). Per this Federal Register Notice, the Standard Form 272 is replaced by the Standard Form 425 (Federal Financial Report) and outlines the timing of the sponsor submittal.

b. Standard Form 271, Outlay Report and Request for Reimbursement for Construction Programs (see the AIP Forms link in Appendix B), or ADO approved equivalent. The ADO may allow the use of a Standard Form 270, Request for Advance or Reimbursement (see the AIP Forms link in Appendix B), for non-construction projects in lieu of Standard Form 271.

5-54. Requirements for Retaining/Providing Supporting Documentation.

The sponsor is responsible for maintaining all of the documentation supporting a grant payment and making this information available upon request.

Per 2 CFR §§ 200.333- 200.337, the sponsor is required to keep these records for at least three years from the date the sponsor submits the last payment request. If any litigation, claim, negotiation, audit or other action involving the records has been started before the end of the three year period, the sponsor must retain the records until the completion or resolution of the action, or the three year period, whichever is later.

Section 7. Grant Amendments.

5-55. Criteria for Amending a Grant.

49 USC § 47108 allows the ADO to amend a grant once it has been issued. The ADO is allowed to issue an amendment as long as the ADO adheres to the criteria in Table 5-26 through Table 5-28. The appropriate amendment formats are described in Table 5-29.

Table 5-26 Criteria for an ADO to Amend a Grant

If the grant description…	The ADO can amend the grant if the following criteria are met…
a. Remains the same (regular amendments)	**(1)** If the grant amount will be increased, the sponsor must make the request in writing and fully document the amount and justification. **(2)** Decreases to the grant amount can be requested by the sponsor in writing or can be initiated by the ADO. The standard practice is for the sponsor to submit a written request fully documenting the amount and reason for the decrease, which the ADO must include in the grant file. However, the ADO has the option to decrease a grant, even if the sponsor is in disagreement, as long as the ADO documents the decision in the grant file. **(3)** The ADO must determine that it is advantageous to the Federal government. **(4)** The ADO must not increase the grant amount for planning projects. This restriction is based on 49 USC § 47108(b)(3) which only allows increasing the grant amount for airport development or land acquisition projects. **(5)** Normally, the ADO only amends a grant at closeout to adjust the grant amount to reflect final costs. However, the ADO has the options to amend the grant more than once and at times other than at closeout. **(6)** In the rare case where a grant is based on estimates, the ADO must amend the grant to remove excess funds as soon as the actual costs are known. **(7)** The ADO has confirmed that the applicable requirements in Chapter 3 have been met. **(8)** The ADO has confirmed that the amendment increase is within the limits found in Table 5-27.
b. Remains the same (amendment to correct the Federal share percentage)	**(1)** Unless the grant is a multi-year grant (see multi-year amendment below) or the ADO needs to correct a mistake in the Federal share percentage, the Federal share percentage must remain the same throughout the life of the grant. The ADO must not amend a grant to change the Federal share unless the amendment is needed to correct a mistake in the Federal share percentage.
c. Remains the same (adding future year funds to a multi-year amendment)	**(1)** Unless otherwise required by the ADO, the sponsor is not required to submit a written request. **(2)** The multi-year amendment will not increase the total Federal share for the multi-year agreement beyond the amount listed in the original grant agreement. **(3)** The ADO is only allowed to include sponsor entitlement funds (passenger, cargo, or nonprimary) in the multi-year amendment. **(4)** If the Federal participation rate changes during the course of the multi-year grant, the ADO must write the amendment using the current fiscal year rate (not the rate that was in affect when the grant was issued).

Table 5-26 Criteria for an ADO to Amend a Grant

If the grant description…	The ADO can amend the grant if the following criteria are met…
d. Remains the same (adding additional funds to a multi-year amendment)	**(1)** If the Federal share of the eligible project costs exceeds the total multi-year amendment amount established in the initial grant agreement, the ADO has the option to issue a regular amendment. **(2)** The ADO must follow the amendment rules for increases in Table 5-27 and use the total multi-year amendment amount as the basis of these calculations. **(3)** The total multi-year funding amount is the sum of the initial year and future years.
e. Is changed to clarify a project	**(1)** If the ADO is clarifying the project with no change in funding, then the ADO can initiate this action. Unless requested by the ADO, the sponsor does not need to request the change in writing or provide additional information. **(2)** The change to the grant description must simply provide a corrected grant description for the originally intended project. For this situation, work can only be added to the description if the ADO inadvertently omitted it from the original grant description. For example, the ADO might change the grant description to add relocation of a PAPI associated with a runway extension if the PAPI was always intended to be included in the project. **(3)** If the ADO wants to also adjust the funding for final project costs in the same amendment, then all of the criteria in Item a of this table also apply. **(4)** To avoid the risk of an improper payment, the ADO must issue the clarifying amendment prior to the start of the affected work.

Table 5-26 Criteria for an ADO to Amend a Grant

If the grant description…	The ADO can amend the grant if the following criteria are met…
f. Is changed to add a project and increase funding in the grant	**(1)** FAA policy is to avoid adding both a new project and funding to a grant. The ADO must only consider using this option in rare circumstances. The standard accepted practice is to issue a new grant. An example of a suitable situation to add both a new project and funding is when it will help rapidly implement an emergency fix related to the original grant scope (i.e., during a runway rehabilitation, to replace a failure of a taxiway lighting system on the taxiway that is used to move aircraft around the closed runway). In this example, replacement of a taxiway lighting system would normally be a separate grant. This work is closely related to the current project, and the taxiway lighting system must be operational in order to support existing night operations on the airport. **(2)** The sponsor must make the request in writing and fully document the amount and justification. **(3)** The ADO must determine that it is advantageous to the Federal government. **(4)** FAA policy is that the ADO must have requested, and received separate regional approval from the 610 branch in advance of adding a new project to the grant. **(5)** The ADO must determine that the need for the additional project is closely related to a project contained in the original grant. **(6)** If there is enough sponsor entitlement in the grant to cover the new project, then the sponsor can begin the work on the new project before the amendment is issued. Otherwise, the ADO must follow the reimbursement rules in Paragraph 3-100, replacing *grant execution date* with *grant amendment execution date*. **(7)** The ADO has confirmed that the applicable requirements in Chapter 3 have been met. **(8)** All other statutory and regulatory requirements (such as environmental clearance, aeronautical study determination, ALP) that may apply to the new project have been or will be met.

Table 5-26 Criteria for an ADO to Amend a Grant

If the grant description…	The ADO can amend the grant if the following criteria are met…
g. Is changed to add a project (with no increase in funding over the original grant amount)	**(1)** The sponsor must make the request in writing and fully document the amount and justification. **(2)** The ADO must determine that it is advantageous to the Federal government. **(3)** The sponsor must document that all work in the existing grant has been completed or have progressed to the point that all costs in the existing grant projects are known. **(4)** The ADO must determine that the need for the additional project is closely related to a project contained in the original grant. **(5)** The ADO must not add the project to the grant for the purpose of using excess funds remaining in the grant. The reason for this prohibition is that it delays the timely closeout of the grant and in the case of discretionary funding, bypasses the discretionary funding competition process. **(6)** If there is enough sponsor entitlement in the grant to cover the new project, then the sponsor can begin the work on the new project before the amendment is issued. Otherwise, the ADO must follow the reimbursement rules in Paragraph 3-100, replacing grant execution date with grant amendment execution date. **(7)** FAA policy is that the ADO have requested, and received separate regional approval from the 610 branch in advance of adding a new project to the grant. **(8)** The ADO has confirmed that the applicable requirements in Chapter 3 have been met. **(9)** All other statutory and regulatory requirements (such as environmental clearance, aeronautical study determination, ALP) that may apply to the new project have been or will be met.

Table 5-26 Criteria for an ADO to Amend a Grant

If the grant description…	The ADO can amend the grant if the following criteria are met…
h. Is changed to delete a project (not land)	**(1)** Deletion of a project from a grant can be requested by the sponsor in writing or can be initiated by the ADO. The standard practice is for the sponsor to submit a written request, and ADO initiation of an amendment to delete a project is normally only done when the sponsor does not agree with the amendment. Unless the deletion is initiated by the ADO based on information the ADO has in house, the sponsor must fully document the amount and reason for the deletion. **(2)** The ADO must determine that it is advantageous to the Federal government to delete the project. **(3)** The ADO must adjust the grant amount by the Federal share of the deleted project. **(4)** The amendment must not prejudice the interests of the United States. This is a rare occurrence and APP-500 will notify the ADO if the situation exists. **(5)** To avoid the risk of an improper payment, the ADO must issue the amendment so that the sponsor does not inadvertently draw down funding for the deleted work.
i. Is changed to delete a land project from the grant	**(1)** Deletion of land acquisition from a grant can be requested by the sponsor in writing or can be initiated by the ADO. The standard practice is for the sponsor to submit a written request, and ADO initiation of an amendment to the land project is normally only done when the sponsor does not agree with the amendment. Unless the deletion is initiated by the ADO based on information the ADO has in house, the sponsor must fully document the amount and reason for the deletion. **(2)** The ADO must determine that it is advantageous to the Federal government to delete the land project. **(3)** The ADO must adjust the grant amount by the Federal share of the deleted land project. **(4)** The amendment must not prejudice the interests of the United States. This is a rare occurrence and APP-500 will notify the ADO if the situation exists. **(5)** Because AIP cannot pay twice for the same costs, if the sponsor has received payment on any incurred land acquisition cost, the sponsor must repay those costs or provide written confirmation to the ADO that the costs for performing that work again will be locally funded. **(6)** To avoid the risk of an improper payment, the ADO must issue the amendment so that the sponsor does not inadvertently draw down funding for the deleted work.

Table 5-26 Criteria for an ADO to Amend a Grant

If the grant description…	The ADO can amend the grant if the following criteria are met…
j. Is changed to modify a project	**(1)** The sponsor must make the request in writing and fully document the amount and justification for the modification. **(2)** If a portion of a project is deleted, the ADO must determine a usable unit will still be obtained. **(3)** If the project scope is being increased, the ADO must determine that the need for the additional work is closely related to the original project. **(4)** The ADO must determine that it is advantageous to the Federal government. **(5)** FAA policy is that the ADO must have requested, and received separate regional approval from the 610 branch in advance of modifying a project within the grant. **(6)** Examples of a project modification are increasing a runway extension from 400' to 500' or reducing scope of a fencing project. **(7)** To avoid the risk of an improper payment, the ADO must issue the amendment to modify the project prior to the start of the affected work. **(8)** The ADO has confirmed that the applicable requirements in Chapter 3 have been met.
k. Is changed to substitute a project	**(1)** The sponsor has made the request in writing and has fully documented the amount and justification for the substitution. **(2)** All of the criteria for adding and deleting a project have been met. **(3)** If the cost of the substituted project is less than the deleted project, the ADO decreases the Federal share of the grant accordingly. **(4)** The ADO must determine that the funding rules for the projects do not prohibit the substitution. **(5)** FAA policy is that the ADO must have requested, and received separate regional approval from the 610 branch in advance of substituting a project within a grant. The regional office must provide a higher level of scrutiny if the existing project is funded with discretionary and the new project is of a lower priority. **(6)** To avoid the risk of an improper payment, the ADO must issue the amendment to substitute a project prior to the start of the affected work. **(7)** The ADO has confirmed that the applicable requirements in Chapter 3 have been met.

Table 5-27 Grant Amendment Limits for Increases

Type of Grant	Primary Airport Rules	Nonprimary Airport Rules
a. Land Acquisition	Not more than 15% of the grant amount.	Up to the greater of: ▪ 15% of the grant amount *for land* (Federal share is used here, not project cost). ▪ 25% of the total increase in allowable land costs (project cost is used here, not Federal share). This is currently the only instance where the ADO has the option to amend the original grant amount by more than 15%. See Table 5-28 for example calculations.
b. Airport Development	Not more than 15% of the grant amount.	Not more than 15% of the grant amount.
c. Planning	May not be increased above the grant amount.	May not be increased above the grant amount.
d. Noise Compatibility Projects (implementation, not planning)	Not more than 15% of the grant amount.	Not more than 15% of the grant amount.
e. Design Only Grants	Not more than 15% of the grant amount.	Not more than 15% of the grant amount.
f. Mixed Project Types	Not more than 15% of the grant amount after the planning portion of the grant is deducted.	Not more than 15% of the grant amount after the planning portion of the grant is deducted. If the increase includes land, also take into account the above rules for land and see Table 5-28 for example calculations.

Table 5-27 Grant Amendment Limits for Increases

Type of Grant	Primary Airport Rules	Nonprimary Airport Rules
g. State Block Grants	Not applicable.	As of the publication date of this Handbook, it is FAA policy that the ADO must not amend a state block grant to increase the grant amount. If the ADO does not issue all of the available funds to the state in the first grant of the fiscal year, the ADO must issue the remaining funds in one or more separate grants. If the state chooses to cover an eligible project overrun with AIP funds, the state must only do this with unused entitlements (following all applicable transfer rules per Paragraph 4-11), state apportionment, or discretionary from their open state block grants. Per FAA policy, states are prohibited from using unused discretionary for new projects. This policy aligns the use of discretionary between state block and non-state block grants. The only adjustment an ADO can make to the grant amount is a deobligation to remove any unused funds. Because the State Block Grant Program provides states with the flexibility to reobligate entitlement and state apportionment on new or existing projects, it will be rare for the ADO to deobligate these types of funds. However, for discretionary projects, if the state has not used unused discretionary toward existing projects, then the ADO must deobligate the unused discretionary at grant closeout. If the ADO needs to reduce the funding in the grant at closeout, a separate amendment is not required (the decrease is entered into the system when the closeout is initiated).

Table 5-28 Examples of Grant Amendments with Land Increases for a Nonprimary Airport

Some examples include…

Example 1

Nonprimary airport given a grant for development and land at 90% Federal share.

Item	Original Project Cost	Grant Amount	Final Project Cost
Development	$800,000	$720,000	$800,000
Land	$200,000	$180,000	$260,000
Total	$1,000,000.00	$900,000.00	$1,060,000.00

Development: No change in development cost. Therefore, grant amount portion remains at $720,000.

Land: Total cost of land increases by $60,000. The grant amount may be increased by 25% of the difference between the final total project cost and the original total project cost of the land (($260,000-$200,000) x 25% = $15,000), or by 15% of the original Federal share of the grant pertaining to the land ($180,000 x 15% = $27,000), whichever is greater. Consequently, the land portion of the original grant amount of $180,000 can be increased by $27,000 to $207,000.

Final Grant Amount: $720,000 + $207,000 = $927,000

Table 5-28 Examples of Grant Amendments with Land Increases for a Nonprimary Airport

Some examples include…

Example 2

Nonprimary airport given a grant for development and land at 90% Federal share.

Item	Original Project Cost	Grant Amount	Final Project Cost
Development	$800,000	$720,000	$950,000
Land	$200,000	$180,000	$400,000
Total	$1,000,000.00	$900,000.00	$1,350,000.00

Development: Development cost increases by $150,000. The development portion of the grant amount can be increased by a maximum of 15%. Therefore, the maximum increase is ($720,000 x 15% = $108,000). The amended grant amount for development is $828,000.

Land: Total cost of land increases by $200,000. The grant amount may be increased by 25% of the difference between the final total project cost and the original total project cost of the land (($400,000-$200,000) x 25% = $50,000), or by 15% of the original Federal share of the grant pertaining to the land ($180,000 x 15% = $27,000), whichever is greater. Consequently, the land portion of the original grant amount of $180,000 can be increased by $50,000 to $230,000.

Final Grant Amount: $828,000 + $230,000 = $1,058,000

Note: In this case, the amended total grant amount is increased by an amount which is more than 15% of the original grant amount.

Table 5-29 Appropriate Amendment Formats

The following format is appropriate…	When all of the following criteria apply…
a. Formal Amendment (FAA Form 5100-38) (See the AIP Forms link in Appendix B.)	**(1)** If one or more of the following conditions exist: **(a)** The amendment will change the grant assurances. **(b)** The amendment will change the grant conditions. **(c)** A project within the grant is controversial. **(d)** A project within the grant is in litigation. **(e)** The amendment reduces the grant by equal to or more than $25,000 or 5% of the current approved grant obligation, whichever is greater, and the grant is not being closed out. (For a grant reduction at closeout, a separate amendment is not required because the decrease is entered into the system when the closeout is initiated.)

Table 5-29 Appropriate Amendment Formats

The following format is appropriate…	When all of the following criteria apply…
b. Final Payment Notification and FAA Final Project Report (See Table 5-33)	**(1)** The ADO is basing the final grant amount upon the FAA final project report and completes the sponsor notification as outlined in Table 5-33. **(2)** The grant amount will be reduced, and the reduction is less than $25,000 or 5% of the current approved grant obligation, whichever is greater.
c. Multi-Year Amendment (Letter from the ADO to the sponsor)	**(1)** The sole amendment purpose is to add multi-year funding as described in the grant agreement.
d. Letter Amendment (Letter from the ADO to the sponsor)	**(1)** None of the above formats are applicable.

5-56. Procedure for the ADO to Process an Amendment.

After all of the criteria in Paragraph 5-55 have been met, the ADO processes the amendment using the steps in Table 5-30.

Table 5-30 Amendment Steps

The amendment steps are…
a. **Reductions as part of a closeout**. If the ADO is simply reducing the funding in the grant as part of the closeout and is not required to complete a formal or letter amendment per Table 5-29, the ADO must follow the steps in Table 5-33 instead of those in this table.
b. **Amendment Programming**. The ADO creates an amendment in the automated AIP system from an open grant. If the grant is closed, the ADO must reopen the grant following regional policy and/or approval. The amendment is then reviewed at the regional level. If the amendment is approved, it is then ready to begin the congressional notification process, if required. If congressional notification is not required, the amendment skips to the funds reservation step.
c. **Congressional Notification (if applicable).** If the grant amount is increased, the ADO may be required to send the amendment through the congressional notification process. APP-520 provides the criteria for sending an amendment through congressional notification process based on legislation and DOT Office of the Secretary (OST) requirements.

Table 5-30 Amendment Steps

The amendment steps are…
d. Funds Reservation (if applicable). If amendment is to increase funds, the ADO must reserve the funds in the automated AIP system. The system generates an electronic FAA Form 1413-1, Request for Change in Reservation/Obligation. This is reviewed in the system at the regional level and if approved, the system forwards the request to the FAA Office of Finance and Management, FAA Accounts Payable Section B (AMK-314) for AMK-314's acceptance. Once AMK-314 accepts the reservation in the system, the funds are officially reserved.
e. Recovery of Funds (if applicable). If the amendment is to decrease funds, the ADO must decrease the funds in the automated AIP system. The system generates an electronic FAA Form 1413-1, Request for Change in Reservation/Obligation. This is reviewed in the system at the regional level and if approved, the system forwards the request to AMK-314 for AMK-314's acceptance. Once AMK-314 approves the decrease, the system forwards the request to the FAA Office of Budget and Performance – Operations and Capital Execution Branch (ABP-410) for ABP-410 approval. Once ABP-410 approves the decrease in the system, the funds are officially recovered.
f. Amendment Offer. The ADO issues the amendment offer to the sponsor using the format required in Table 5-29.
g. Amendment Acceptance (if applicable). If a formal amendment is used, the sponsor and the sponsor's attorney must sign and return the executed amendment to the ADO. The sponsor's attorney *must* sign the amendment *after* the sponsor in order for the amendment to be properly executed. The amendment cannot be altered by the sponsor without ADO concurrence and issuance of another grant amendment. The sponsor must keep one executed amendment for its files.
h. AMK-314 Notification. If the funding amount has been changed, the ADO must send a scanned copy of the signed amendment to AMK-314.

Section 8. Grant Closeouts.

5-57. Grant Closeout Steps and Requirements.

In order for the ADO to close a grant, the ADO and sponsor must have completed three basic steps. These are:

a. Physically complete all projects in the grant (as discussed in Table 5-31).

b. Complete all grant administrative and financial requirements (as discussed in Table 5-32).

c. Complete the closeout processing steps (as discussed in Table 5-33).

2 CFR § 200.210 requires Federal agencies to identify a period of performance for Federal grants. The FAA has established this period of performance as a maximum of four years from the date of grant execution. 2 CFR § 200.331 also requires pass through entities such as block grant states to identify a period of performance for subgrants.

2 CFR § 200.343 requires that the sponsor submit all required closeout documentation to the ADO within 90 days after the period of performance ends. However, per 2 CFR § 200.343(a), APP-520 has the option to extend this time frame to beyond the 90 days.

Per 2 CFR § 200.343, the FAA has a maximum of one year from receipt and acceptance of the closeout documentation to complete all closeout actions. This includes all closeout actions from all FAA offices (including the FAA Office of Finance and Management, FAA Accounts Payable Section B (AMK-314)). APP-520 has the option to further define ADO specific closeout time frames within this one year period.

Table 5-31 Project Physical Completion Requirements

For the following type of project…	The project is not complete until the following requirements are met…
a. Planning	**(1)** The sponsor has submitted the final planning deliverable to the ADO. **(2)** The FAA has reviewed, accepted, or approved the planning document as applicable..
b. Land Acquisition	**(1)** The sponsor has obtained satisfactory property interest in all parcels included in the grant description. **(2)** The sponsor has submitted an updated Exhibit A to the ADO that properly reflects the land acquisition.
c. Equipment Acquisition	**(1)** The sponsor has full ownership of the equipment (must be delivered, installed, and tested in accordance with plans and specifications). **(2)** The FAA Air Traffic Organization (ATO) has completed all required commissioning, inspection, initial flight check, and/or acceptance requirements (if applicable to the project). **(3)** The sponsor has submitted any FAA required equipment inventory updates to the ADO.
d. Construction	**(1)** The ATO has completed all required commissioning, inspection, initial flight check, and/or acceptance requirements (if applicable to the project). **(2)** The sponsor has completed the final inspection and verifies that all punch list items have been addressed. **(3)** A complete and useable facility is fully available for its intended use (except in the case of phased projects). **(4)** The sponsor has received the as-built plans. The ADO has the option to require the sponsor to submit an electronic or paper copy of these plans to the ADO.

Table 5-32 Grant Administration Closeout Requirements

For the following item…	The ADO must verify that the following requirements are met prior to the ADO processing a grant closeout…
a. Standard Required Sponsor Documentation per 2 CFR § 200.343	**(1)** The sponsor has submitted all documentation required based on the sponsor's risk level and the type of project including the following closeout specific documentation: **(a)** The final Standard Form 425, Federal Financial Report (see the AIP Forms link in Appendix B), equivalent. This requirement for a final Standard Form 425 is included in the instructions for this form. **(b)** An advance paper copy of the final Standard Form 271, Outlay Report and Request for Reimbursement for Construction Programs (see the AIP Forms link in Appendix B), or equivalent, that summarizes the final project costs. The ADO may allow the use of a Standard Form 270, Request for Advance or Reimbursement (see the AIP Forms link in Appendix B), for non-construction projects in lieu of Standard Form 271. This advance copy provides the information that the ADO needs to determine the final allowable project cost. Note that the sponsor will still have to make a final payment request once the ADO completes their determination. **(c)** The final vendor invoices (unless the final vendor invoice is less than $1,000). For state block grants, the ADO has the option to only require a list of subgrants that shows the projects and final project amounts as long as the state has obtained the final vendor invoices.
b. Additional Sponsor Documentation Required by the ADO	**(1)** The ADO has the option to require the sponsor to submit any other documentation the ADO determines necessary to support the grant closeout. This may include a formal closeout package or separate items such as a final construction report that summarizes major project issues, a summary of project events, a project timeline, a summary of any Department of Labor issues, and the final DBE participation rates.
c. Additional Sponsor Documentation Required by the ADO for AWOS projects	**(1)** The FAA must have determined that the AWOS has been successfully commissioned, and the sponsor must have provided the ADO with the FAA initial inspection and successful commissioning documentation. **(2)** The sponsor must have provided the ADO with a copy of the Weather Message Switching Center reporting contract with the third party interface provider if the sponsor has a connection to the Weather Message Switching Center Replacement (WMSCR). (Note that AWOS-A, A/V, I and II are not eligible for reporting, so this is not required.)
d. Grant Special Conditions	**(1)** The sponsor has met all of the grant special conditions required to be accomplished during the grant.
e. Updated Airport Layout Plan	**(1)** The sponsor has updated the ALP to reflect that the project has been completed (vs. proposed). Not all projects are shown on the ALP (such as runway rehabilitation or equipment acquisition) and in those cases an ALP update is not required. This does not normally require an additional aeronautical study.

Table 5-32 Grant Administration Closeout Requirements

For the following item…	The ADO must verify that the following requirements are met prior to the ADO processing a grant closeout…
f. Exhibit A	**(1)** The sponsor has updated the Exhibit A to reflect that the property acquisition has been completed.
g. Noise Land Inventory and Reuse Plan	**(1)** The sponsor has updated the Noise Land Inventory and Reuse Plan to reflect that the property acquisition has been completed. Noise Land Management and Requirements for Disposal of Noise Land or Development Land Funded with AIP (see Appendix B for link) contains guidance for these plans.
h. Environmental Requirements	**(1)** All project related environmental requirements found in the environmental determination have been completed.
i. Program Income, Including Interest Earned	**(1)** The sponsor has identified any program income, including interest earned and liquidated damages on Federal grant funds, in the Program Income section of Standard Form 425 Federal Financial Report (or equivalent) (see the AIP Forms link in Appendix B). **(2)** The sponsor must have deducted this income from the Federal share of the grant.
j. Disputed Costs	**(1)** The sponsor has identified any disputed costs in the Remarks section of Standard Form 425, Federal Financial Report (or equivalent) (see the AIP Forms link in Appendix B). **(2)** If the sponsor and the contractor do not agree on the amount owed to the contractor, and the dispute is likely to go to court, the sponsor has only requested reimbursement for the amount that is not in dispute. **(3)** Following review of the sponsor's closeout documentation, the ADO may choose to continue with the project closeout or leave the grant open until all litigation is completed.
k. Overpayment	**(1)** If Standard Form 425, Federal Financial Report (or equivalent), indicates that payments have been made which exceed the Federal share of the allowable costs, the sponsor must repay this amount (see the AIP Forms link in Appendix B). **(2)** The ADO must notify the DOT Office of Inspector General (OIG) if the ADO has reason to believe the overpayment was a deliberate attempt to defraud the FAA. The OIG hotline is available for this purpose (see Appendix B for link). **(3)** The ADO must notify the FAA Office of Finance and Management, FAA Accounts Payable Section B (AMK-314) in writing of the overpayment. **(4)** The sponsor must send a check for the overpayment amount as directed in the Airport Improvement Program (AIP) Grant Payment and Sponsor Financial Reporting Policy (see Appendix B for link) which is based on DOT requirements. The overpayment processing must follow the DOT electronic grant payment system policy through the Delphi eInvoicing system.

Table 5-33 Closeout Processing Steps

The closeout processing steps are…
a. FAA Final Project Report. Once all of the project physical completion requirements in Table 5-31 and the grant administration closeout requirements in Table 5-32 have been met, the ADO must conduct a final project review that results in an FAA final project report. The report must contain information deemed necessary for a subsequent examination or evaluation of the project. The report will normally be prepared and signed by the ADO project manager. The report must then also be reviewed and signed by the regional division manager (the regional division manager may delegate the approval authority down, but the authority must remain at one level higher than the project manager in the chain of command). This constitutes a routine element of program checks and balances as required by 2 CFR §§ 200.343 and 200.303 (OMB Circular A-123, Management's Responsibility for Internal Control).
b. Final Payment Notification. Once the ADO completes the FAA final project report, the ADO must provide a written notification to the sponsor. This notification must include: **(1)** the maximum obligation amount calculated in the FAA final project report, **(2)** the reason for any differences between the maximum obligation amount and the sponsor's requested amount, and **(3)** the FAA final project report. The ADO must place a copy of this notification in the grant file. Until the ADO completes the FAA final project report and completes this sponsor notification, the ADO must follow the requirements in Paragraph 5-46 for payment within the last 10% of the Federal share of the grant (or the last 10% of the estimated Federal share of the grant after amendment, whichever is less). The ADO has the option of excluding a state block grant from this requirement only if the state is following this requirement for all of the subgrants within the state block grant and the ADO is confident that the state will submit the state block grant closeout documentation in a timely manner.
c. Amendments. If the ADO needs to change the work scope or increase the funding, the ADO must follow the amendment requirements and process listed in Paragraphs 5-55 and 5-56. If the ADO needs to reduce the funding in the grant, a separate amendment is not required (the decrease is entered into the system when the closeout is initiated).
d. Final Payment Request Approval. Once the ADO notifies the sponsor of the final payment amount and completes any necessary amendment actions, the sponsor must submit the final payment request through the currently approved Department of Transportation grant payment system.
e. Validation of Draw Downs. The ADO must not process a closeout in the automated AIP system until the sponsor has drawn down the entire final grant amount calculated in the ADO's final project report. The ADO must validate this by reviewing the draw downs on the grant in the current financial system being used by the FAA Office of Finance and Management, FAA Accounts Payable Section B (AMK-314).

Table 5-33 Closeout Processing Steps

The closeout processing steps are…
f. Initiating Closeout. After the ADO has validated the drawdowns, the ADO must initiate a closeout in the automated AIP system for the grant. The ADO can reduce the grant amount at this time to reflect the final project cost. The closeout is then reviewed at the regional level. If it is approved, the system will generate an electronic FAA Form 1413-1, Request for Change in Reservation/Obligation (if the grant is decreased) and will send the decrease (if applicable) and closeout request to AMK-314. The ADO has the option of printing this form and placing a copy in the grant file, however, this is not mandatory because the form is retained in the automated AIP system.
g. AMK-314 and the FAA Office of Budget and Performance – Operations and Capital Execution Branch (ABP-410) Review and Acceptance. Once AMK-314 makes any necessary funding adjustments in their financial system and approves the closeout; and all recoveries (if applicable) are approved in the automated AIP system by ABP-410; the grant is officially closed in the automated AIP system.
h. Grant Closeout Letter. After AMK-314 and ABP-410 review and acceptance is complete, the ADO must notify the sponsor of the grant closeout in writing. This closeout letter must include the grant closeout date and the final grant amount. The ADO must send a scanned copy of this letter to AMK-314 and include a copy in the grant file.
i. Printing FAA Form 5100-107, Airport Improvement Program Form (also called AIP Grant Status Report). At this point, the ADO has the option of printing the FAA Form 5100-107, Airport Improvement Program Form (also called AIP Grant Status Report) generated by the automated AIP system and placing the form in the grant file. However, this is not mandatory because a current version of the form containing the grant history is retained in the automated AIP system.

5-58. Block Grant Closeout.

In order for the ADO to close a block grant, the ADO and block grant sponsor must have completed three basic steps as shown in Table 5-34: The required state and ADO closeout time frames are discussed in Paragraph 5-57.

Table 5-34 Block Grant Closeout Requirements

In order for the ADO to close a block grant, the ADO and block grant sponsor must have…
a. Physically, administratively, and financially closeout all of the projects that were issued under the specific state block grant.
b. Followed the requirements in the block grant master agreement regarding which documents must be submitted to the ADO and which documents must be retained by the sponsor.
c. Completed the financial closeout steps in Table 5-33 for the specific state block grant.

Section 9. Grant Suspension and/or Termination.

5-59. Reasons for Possible Grant Suspension or Termination.

Table 5-35 includes examples of when the ADO would consider suspending or terminating a grant. Note that for civil rights violations and non-compliance issues, there are additional legislative requirements. The FAA Office of Civil Rights (ACR) and ACO-100 are responsible for providing the ADO with direction on meeting these requirements.

In addition, if the suspension or termination of the grant will involve withholding an existing grant payment request, the ADO must follow the requirements in Paragraph 5-48.

Table 5-35 Examples of Reasons for Grant Suspension or Termination

Some examples include…	
a.	The circumstances that justify the project no longer exist.
b.	The sponsor has not incurred any cost on the project and has requested that the grant be deferred.
c.	The ADO has determined that progress on the project has stopped.
d.	The ADO has determined that the project cannot be commissioned and accepted into the National Airspace System.
e.	The ADO has determined that the sponsor has not met the requirements of a grant special condition.
f.	ACO-100 has notified the ADO that the sponsor is in non-compliance and has advised the ADO to suspend or terminate the grant. The applicable compliance requirements are contained in 14 CFR part 16, Rules of Practice for Federally-Assisted Airport Enforcement Proceedings, and the current version of FAA Order 5190.6, FAA Airport Compliance Manual.
g.	The FAA Office of Civil Rights (ACR) has determined that the sponsor has violated a civil rights requirement and has advised the ADO to suspend or terminate the grant. This is because ACR, not the ADO, is the point of contact for civil rights enforcement procedures, while the ADO normally handles any required grant suspension or termination procedures.

5-60. Suspension of a Grant.

The ADO may suspend the grant in whole or in part if the sponsor fails to comply with conditions of the grant. The ADO does this through a written notice to the sponsor. Costs incurred by the sponsor on the grant project after the sponsor has received the suspension notice are not allowable, unless specifically authorized in writing by the ADO. The ADO may allow costs which are otherwise allowable and could not be avoided during the period of suspension. The notice of suspension must contain the following:

a. The reasons for the suspension and the corrective action necessary to lift the suspension.

b. A date by which the corrective action must be taken.

c. Notification that the sponsor has a right to request that the Associate Administrator for Airports (ARP-1) reconsider the suspension or termination.

d. Notification that the ADO will be giving consideration to terminating the grant if the sponsor does not take the corrective action by the required date.

In addition, if the suspension of the grant will involve withholding an existing grant payment request, the ADO must follow the requirements in Paragraph 5-48.

5-61. Termination for Cause.

The ADO may unilaterally terminate the grant for cause if the sponsor fails to comply with the conditions of the grant. This is done by written notice to the sponsor. The ADO must use the following procedures for termination:

a. First, the ADO must have already suspended the grant.

b. The ADO must only use factual and objective language in all correspondence which may lead to termination for cause.

c. The ADO must send a written notification of the proposed termination to APP-1 and ACO-100 at the earliest possible opportunity. The ADO must also forward a copy of the notice of suspension and the ADO assessment of the sponsor's action to remedy the situation to APP-500 and ACO-100.

d. Upon receipt, ACO-100 will acknowledge the proposed termination to the ADO via telephone or e-mail. Within 30 days of ACO-100's acknowledgement, ACO-100 will notify the ADO, in writing, of the procedures to be followed.

e. The ADO must notify the sponsor of the termination in writing. This notice must include the reasons for the termination and must inform the sponsor of their right to request the Associate Administrator (ARP-1) reconsider the suspension or termination.

f. The ADO must ensure that payments or recoveries of payments under the grant are in accordance with the legal rights and liabilities of all parties involved.

g. ACO-100 may require the ADO to provide further coordination and action as a result of the termination for cause in accordance with 14 CFR part 16, Rules of Practice for Federally-Assisted Airport Enforcement Proceedings, and the current version of FAA Order 5190.6, FAA Airport Compliance Manual.

h. The FAA Office of Civil Rights (ACR) may require the ADO to provide further coordination and action as a result of the termination for cause in accordance with the applicable civil rights requirements.

In addition, if the termination of the grant will involve withholding an existing grant payment request, the ADO must follow the requirements in Paragraph 5-48

5-62. Termination for Convenience.

The ADO has the option of terminating a grant for convenience if there is no beneficial reason to continue the project. This can be initiated by either the ADO or the sponsor. Termination for convenience requires:

a. A written agreement that details the termination conditions, including the effective date and, in the case of partial terminations, the portion to be terminated.

b. The termination agreement must state that the sponsor may not incur new obligations for the terminated portion of the grant after the effective date and must cancel as many obligations relating to the termination as possible.

c. The ADO can reimburse the sponsor for allowable project costs that were incurred prior to the effective cancellation date if, in the opinion of the ADO, incurring the costs was unavoidable and could not be canceled.

In addition, if the termination of the grant will involve withholding an existing grant payment request, the ADO must follow the requirements in Paragraph 5-48.

Section 10. Post-Grant Actions.

5-63. Sponsor Records Retention.

2 CFR §§ 200.333-200.337 requires that a sponsor retain all grant related documentation for three years after the sponsor submits the final payment request. If a sponsor becomes involved in litigation or other action involving the records, the sponsor must retain the records until the issue is resolved or the end of the three year period, whichever is later.

Sponsors are also required to provide copies of this documentation upon request to the FAA, the DOT Office of Inspector General (OIG), General Accountability Office and independent auditors acting on behalf of those offices, and independent auditors under the Single Audit Act of 1984.

Table 5-36 contains examples of documentation that the sponsor must retain.

Table 5-36 Examples of Documents that a Sponsor Must Retain

Some examples include…	
a.	Invoices and inspection reports for third party contracts and suppliers.
b.	Detailed employee pay records (including supporting labor distribution records) for force account work.
c.	Detailed labor distribution for project administration costs.
d.	Records of land purchases (including relocation costs).

5-64. ADO Records Retention.

The ADO must retain grant records according to the requirements of the current version of FAA Order 1350.14, Records Management.

5-65. Reopening Grants.

In extraordinary circumstances, a grant can be reopened by the ADO if the ADO finds that the sponsor has either not been reimbursed for allowable costs or has been reimbursed for costs that are not allowable. The ADO must notify APP-520 in writing before the ADO reopens any closed grant explaining the reason that this action is necessary.

5-66. Audit Requirements.

2 CFR part 200, Subpart F (OMB Circular A-133, Audits of States, Local Governments and Non-Profit Organizations), establishes audit requirements for states, local governments, and non-profit organizations receiving Federal funding, which includes AIP. Table 5-37 contains the guidance on when AIP audit are required by entity, including privately owned sponsors that do not fall under 2 CFR § 200.501 (OMB Circular A-133, Audits of States, Local Governments and Non-Profit Organizations).

A grant can be audited at any time whether the grant is open or closed. Audit standards and requirements are included in 2 CFR part 200) and in the Single Audit Act of 1984. Revenue use compliance reviews are also required as part of the ACO-100 requirements and are discussed in the current version of FAA Order 5190.6, FAA Airport Compliance Manual.

The ADO has the option of requesting that the DOT Office of Inspector General (OIG) conduct additional audits where the ADO determines a need exists. Examples of reasons for the ADO to request an additional audit include where there is evidence of financial discrepancies or evidence of an unusual financial situation.

Table 5-37 Requirements for AIP Audits by Entity

For the following entity…	The following audit requirements apply…
a. Publicly Owned Sponsor	If the sponsor expends Federal grants for more than $500,000 in a fiscal year in Federal funding, the sponsor must have a single or program-specific audit conducted for that fiscal year. This $500,000 requirement applies to all Federal funding, not just AIP.
b. Block Grant Subgrant Recipient	If the sponsor expends Federal grants for more than $500,000 in a fiscal year in Federal funding, the sponsor must have a single or program-specific audit conducted for that fiscal year. This $500,000 requirement applies to all Federal funding, not just AIP. For block grant states, it is the opinion of the FAA that the airport receiving the subgrant, not the state, is responsible for obtaining the single audit. The airport that received the subgrant must report the grants on their Schedules of Expenditures of Federal Awards (see 2 CFR § 200.331 (OMB Circular A-133, Audits of States, Local Governments and Non-Profit Organizations)). The airport must report the grant on their Schedules of Expenditures of Federal Awards as subrecipients.
c. Block Grant State	For block grant states, it is the opinion of the FAA that block grant states are responsible for ensuring the airports under the block grant obtain single audits, if required. For block grant states, both the state must report the grants on their Schedules of Expenditures of Federal Awards (see 2 CFR § 200.331 (OMB Circular A-133, Audits of States, Local Governments and Non-Profit Organizations)). The states must report the grants to airports as a pass through.
d. Privately Owned Sponsor	2 CFR part 200 Subpart F (OMB Circular A-133, Audits of States, Local Governments and Non-Profit Organizations) does not apply to privately owned sponsors. However, the ADO must require the privately owned sponsor to have an audit of the grant conducted for all but the most basic projects (such as acquisition of a snow removal vehicle). The ADO must include a special condition in the grant to require this. The automated AIP system contains the current available special conditions. This audit must be conducted at the completion of the project and must be done in accordance with accepted standard audit practices. The sponsor must provide copies to both the ADO and the OIG.

5-67. Disposal of AIP Funded Equipment.

The criteria for a sponsor to dispose of equipment that is no longer needed, is being replaced, or has exceeded its useful life (per Paragraph 3-12) are listed in Table 5-38. The criteria are consistent with 2 CFR § 200.33. A sponsor can determine the fair market value by advertising the equipment to determine the amount a willing purchaser would pay, or by hiring an accredited appraiser. Advertising is different than soliciting specific companies. Advertising opens up the arena to a large audience. Soliciting narrows that audience and therefore is not allowable.

Table 5-38 Criteria for Disposing or Replacing AIP Funded Equipment

If the equipment is…	And, per 2 CFR § 200.33, the fair market value is…	The following applies…
a. Retained by the airport (for any use) or donated or sold to any another entity	Less than $5,000.	No reimbursement to the FAA is required.
b. Retained and used for airport purposes	$5,000 or more.	No reimbursement to the FAA is required. No AIP funds may be used to provide building space for this equipment.
c. Retained and used for non-airport purposes	$5,000 or more.	Reimbursement to the FAA is required (for an amount equal to the fair market value multiplied by the current Federal share). The reimbursement to the FAA is accomplished by the ADO reducing the total project cost of the next grant received by the sponsor by an amount equal to the total fair market value of the equipment. No AIP funds may be used to provide building space for this equipment.
d. Donated at no cost to another sponsor and the equipment is both eligible and justified at the receiving airport	$5,000 or more.	The grant obligations for the equipment are transferred to the other sponsor. No reimbursement to the FAA is required.

Table 5-38 Criteria for Disposing or Replacing AIP Funded Equipment

If the equipment is…	And, per 2 CFR § 200.33, the fair market value is…	The following applies…
e. Sold (at fair market value or less) to another sponsor and the equipment is both eligible and justified at the receiving airport	$5,000 or more.	*This is not the preferred scenario. Donation of the equipment is a much more effective way to transfer the equipment.* The grant obligations for the equipment are transferred to the other sponsor. Reimbursement to the FAA is required (for an amount equal to the fair market value multiplied by the current Federal share). The reimbursement to the FAA is accomplished by the ADO reducing the total project cost of the next grant received by the sponsor by an amount equal to the total fair market value of the equipment. The purchasing airport may request a grant for the purchase price, provided the equipment meets FAA specification and has an acceptable useful life based on the purchase price.
f. Sold (at fair market value or less) or donated to a non-eligible entity	$5,000 or more.	Reimbursement to the FAA is required (for an amount equal to the fair market value multiplied by the current Federal share). This reimbursement amount is required even if the equipment was donated at no cost or sold for less than fair market value. The reimbursement to the FAA is accomplished by the ADO reducing the total project cost of the next grant received by the sponsor by an amount equal to the total fair market value of the equipment.

5-68. Disposal of Excess/Unneeded AIP Funded Land (and ADO/Sponsor Tracking).

49 USC § 47107(c)(2) requires a sponsor to promptly dispose of AIP funded land when the land is no longer needed for airport purposes. In this specific case, airport purpose includes land is needed for an existing or future aeronautical purpose (including runway protection zone) or that serves as noise buffer land.

If the ADO determines that the land is no longer need for these purposes, the sponsor has the choice of either selling or keeping the land for non-airport purposes. In either case, the sponsor must use the Federal share of the fair market value on projects in the order of precedence listed in Table 5-39 per 49 USC § 47107(c)(4). This is done outside of the grant process and requires a

land release approval from the ADO (see the current version of FAA Order 5190, FAA Airport Compliance Manual). The ADO must also review and approve or disapprove the sponsor's choice of how to apply the funding prior to the funds being used for sponsor's requested purpose.

The ADO and regional office may contact APP-400 and ACO-100 for assistance on the ADO and sponsor requirements for tracking and disposal of AIP, Federal Aid to Airports Program (FAAP), or Airport Development Aid Program (ADAP) acquired land.

Table 5-39 Order of Precedence for Applying Sale Proceeds of AIP Funded Land

Order of precedence to apply the Federal share of the fair market value is…
a. Reinvestment in an approved noise compatibility project.
b. Reinvestment in an approved project that is eligible for funding under 49 USC § 47117(e). The only projects in this section of the law are projects eligible for noise and environmental set aside funding. A complete list of projects eligible for noise and environmental set aside funding is contained in Paragraph 4-7.
c. Reinvestment in all other approved airport development projects at the airport.
d. Transfer to a sponsor of another public airport for a noise compatibility project at the other airport.
e. Send the ADO a check as directed by the FAA Office of Finance and Management, FAA Accounts Payable Section B (AMK-314) for deposit in the Airport and Airway Trust Fund.

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Chapter 6. What special AIP programs are available?

Section 1. Letters of Intent (LOI).

6-1. LOI Overview.

A Letter of Intent (LOI) is a formal document issued by the FAA that states an intention to provide future funding using appropriate entitlements or apportionments, discretionary or funds from the small airport fund. The LOI is limited to airport development projects, including project formulation costs, at primary and reliever airports. It is further limited to projects that enhance or preserve capacity. 49 USC § 47110(e) gives the FAA the authority to issue LOIs and describes the requirements and prescribes the limitations on the use of the LOI.

The LOI establishes a schedule for future AIP funding, subject to annual appropriations and availability of funds. A sponsor who has received an LOI may start the project without waiting for individual AIP grants. Allowable project costs are eligible for reimbursement, subject to the payment schedule set forth in the LOI.

The LOI process is rigorous and requires early coordination and a full understanding of the submission and evaluation criteria by all parties involved. This section of the Handbook discusses the regulatory requirements.

Historical LOI information is available on the FAA Office of Airports website (see Appendix B for link). However, this information is not a reliable guide for future award amounts and disbursement schedules.

6-2. LOI Funding Rules and Policy.

Table 6-1 contains the unique funding rules and policy that apply to LOIs.

Table 6-1 LOI Funding Rules and Policy

Unique LOI funding rules and policy include…
a. LOI Budget. Per 49 USC § 47110(e)(4), the FAA must reserve a reasonable amount of AIP funding for grants not covered by LOIs. APP-510 meets this requirement by annually establishing an LOI budget that it uses to establish future LOI payment schedules.
b. Scheduling LOI Payments beyond the Fiscal Year of the Current AIP Authorization. The Department of Transportation and Related Agencies Appropriations Act, 1989 (Section 334 of Public Law 100-457) allows the FAA to issue an LOI with payments scheduled beyond the statutory expiration of the current AIP authorization.

Table 6-1 LOI Funding Rules and Policy

Unique LOI funding rules and policy include…
c. Use of Airport Entitlements. It is FAA policy for a sponsor to commit all of the airport entitlements over the life of the LOI to the project unless APP-500 and the ADO agree otherwise. If during any given year a sponsor's entitlements vary from the amount approved in the LOI schedule for that year: **(1) Fiscal Year Entitlements Less than LOI Schedule**. The ADO cannot increase the discretionary funds to compensate for the shortfall. Instead, the sponsor is expected to make up the shortfall with entitlements from a future year or other funding source. **(2) Fiscal Year Entitlements More than LOI Schedule**. After consultation with the sponsor, the ADO has the discretion to apply the funds to other higher priority projects during that fiscal year, carry over the funds to the following fiscal year, or add them to that year's annual payment (reducing the entitlements that need to be applied to the LOI in future years).
d. Use of Discretionary. It is FAA policy that the total of discretionary funds in all LOIs subject to future obligation is limited to approximately 50% of the forecast discretionary funds available for that purpose. Depending on the size of airport, the discretionary funding may be drawn from the Capacity/Safety/Security/Noise fund, the Small Airport Fund, or the Remaining Discretionary fund.
e. Use of Passenger Facility Charges. Per 49 USC § 47110(e)(5), the FAA is restricted from requiring a sponsor to impose a passenger facility charge for the project in order to obtain a letter of intent.
f. Reimbursing with Discretionary. The ability to reimburse with discretionary funds under an LOI is discussed in Paragraph 3-100.
g. Change to Nonprimary Airport Status. Per 49 USC § 47108(e)(1), if a primary airport changes to a nonprimary airport when a development project approved under an LOI is underway, the project remains eligible for discretionary funds.
h. Insufficient Project Progress. In cases where significant final design, land acquisition, permitting or other requirements must still be completed, the FAA has an option to establish a disbursement schedule that defers the first year's disbursement until certain milestones have been achieved.
i. Interest Costs. Because interest from bonds or other forms of indebtedness is not an allowable cost, interest costs may not be included in project costs and will not be covered as part of an approved LOI.

6-3. LOI in the Context of an Airport's Overall Capital Program.

The proposed action is the primary project or program in a sponsor's LOI request. Typically, the proposed action is not the only capital project for the airport. The FAA's financial analysis will focus principally on the projects for which the LOI is requested, but it is also beneficial to consider major funding requests in the context of the airport's broader financial environment. Therefore, it is important to clearly define three overlapping sets of capital project data as shown in Table 6-2 and Figure 6-1.

Table 6-2 Three Overlapping Sets of Capital Data in the LOI Review

The three overlapping sets of capital data are…
a. Overall Capital Program. The sponsor must provide a complete financial picture of the airport in its LOI request. This includes both eligible and ineligible airport development needs. The FAA will assess whether any of these needs may impact the sponsor's ability to support the LOI, including other higher priority projects that may require use of entitlement funds. However, the FAA's evaluation will focus primarily on the proposed action.
b. LOI Proposed Action. The proposed action includes all work necessary to achieve the overall LOI objective whether or not the work is AIP eligible. It is important to include all of this work to capture the benefits and/or costs that will be calculated in the Benefit Cost Analysis (BCA) as further discussed in Paragraph 3-14. For example, if the proposed action involves a runway extension, then the proposed action may include multiple related projects such as associated facility relocations. The full cost of the proposed action must be reflected in the BCA and the associated funding plan.
c. LOI Projects. The LOI projects are the individual project elements that the ADO will place under grant if the LOI is approved. These projects must have clearly established AIP eligibility, and must be scheduled for implementation in advance of the requested LOI disbursement schedule.

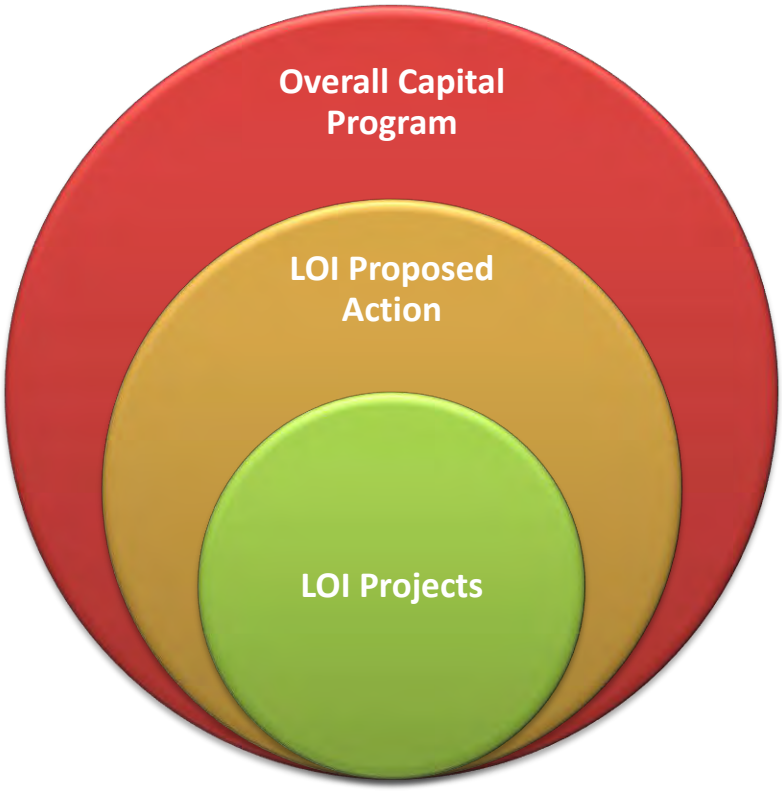


Figure 6-1. Three Overlapping Sets of Capital Data in the LOI Review

6-4. LOI Project Criteria by Airport Type.

49 USC § 47110(e) gives the FAA the authority to issue the LOI's for projects that enhance or preserve capacity at primary and reliever airports. By FAA policy, LOI projects must meet the criteria listed in Table 6-3. All of the other project funding requirements in Chapter 3 apply, including the restriction on using AIP funds for interest payments.

A project under an LOI must also satisfy all statutory and administrative requirements for an AIP project. Sponsors must proceed as though they had applied for and been awarded AIP funds and must fulfill all environmental, civil rights, bidding, procurement, and contracting requirements associated with an AIP grant, even though portions of the work may proceed in advance of receiving AIP funds.

Table 6-3 LOI Project Criteria by Airport Type

For the following type airport…	The following criteria apply…
a. Large and Medium Hub	**Capacity Enhancing Projects:** **(1) Airfield Capacity Enhancement.** The proposed project must enhance airfield capacity by increasing aircraft movements, increasing aircraft seating or cargo capacity (including a different aircraft design group), or reducing airfield delays. **(2) Supporting Infrastructure.** LOI projects must only include other AIP-eligible infrastructure that is logically necessary to complete the LOI project. In many cases this will be something that is physically required, such as acquiring land to complete a runway extension. However, in some cases, project components may not be physically required but logically necessary. For example, when extending a runway, it may also be necessary that the parallel taxiway be extended to ensure the full operational benefits of the runway extension are successfully realized. While the taxiway extension is not physically required, it is logically necessary because it links to the operational efficiency of the LOI project. **(3) Non-Supporting Infrastructure.** The LOI project must not include project components that, while completed concurrently because of convenience, are not logically necessary for the completion of the LOI project or for realizing the benefits of the LOI project. **(4) Aprons.** To qualify for LOI consideration, new apron areas must increase airfield capacity. However, aprons compete less favorably for LOIs than runway or taxiway projects. In addition, apron projects caused by terminal reconfiguration or relocations do not typically add capacity and are rarely eligible under an LOI. **(5) System Capacity**. Per 49 USC § 47110(e)(2)(C), APP-510 must determine that the project will significantly enhance system-wide airport capacity. **(6) Ineligible Rehabilitation or Reconstruction Projects.** Rehabilitation or reconstruction projects undertaken solely to extend the life of existing pavement does not satisfy the system capacity statutory requirement. **(7) Eligible Reconstruction Projects.** Reconstruction of an existing runway or taxiway must strengthen or relocate/shift the pavement and result in a capacity enhancement by: **(a)** Increasing aircraft movements, increased aircraft seating or cargo capacity (including accommodating a different aircraft design group), or reduced airfield delays. **(b)** Creating an added arrival stream or reducing dependency between arrival streams. **(c)** Eliminating intersecting runways. **(d)** Improving departure, approach, or missed approach procedures.

Table 6-3 LOI Project Criteria by Airport Type

For the following type airport…	The following criteria apply…
b. Small Hub, Non Hub, Reliever	**Airfield Capacity Enhancing Projects:** **(1) Airfield Capacity Enhancement.** The proposed project must enhance airfield capacity by increasing aircraft movements, increasing aircraft seating or cargo capacity (including a different aircraft design group), or reducing airfield delays. **(2) Supporting Infrastructure.** LOI projects must only include other AIP-eligible infrastructure that is logically necessary to complete the LOI project. In many cases this will be something that is physically required, such as acquiring land to complete a runway extension. However, in some cases, project components may not be physically required but logically necessary. For example, when extending a runway, it may also be necessary that the parallel taxiway be extended to ensure the full operational benefits of the runway extension are successfully realized. While the taxiway extension is not physically required, it is logically necessary because it links to the operational efficiency of the LOI project. **(3) Non-Supporting Infrastructure.** The LOI project must not include project components that, while completed concurrently because of convenience, are not logically necessary for the completion of the LOI project or for realizing the benefits of the LOI project. **(4) Aprons.** To qualify for LOI consideration, new apron areas must increase airfield capacity. However, aprons compete less favorably for LOIs than runway or taxiway projects. In addition, apron projects caused by terminal reconfiguration or relocations do not typically add capacity and are rarely eligible under an LOI. **Airfield Capacity Preservation Projects** **(1) Eligible Rehabilitation or Reconstruction Projects**. Rehabilitation or reconstruction projects must either enhance or preserve capacity. However, rehabilitation and reconstruction projects to preserve capacity have historically competed less favorably for LOIs than those that will enhance capacity.
c. New or Replacement Airports	**(1) Additional Capacity Considerations.** In addition to the above criteria, new and replacement airports must provide a net capacity gain that would fulfill an unmet civil aeronautical need, with due consideration of the proposed facility's functional and operational position relative to other existing or proposed airport facilities.

6-5. LOI Approval/Disapproval Process.

The FAA's process for evaluating LOI requests is principally a financial planning process rather than grant administration. Formal grant applications will still be required for each year once an LOI is awarded, based on the LOI payment schedule and subject to the availability of funds. The current process, as of the publication date of this Handbook, is contained in Table 6-4. APP-510 also maintains a timeline diagram for the LOI process that is available upon request.

Table 6-4 LOI Approval/Disapproval Process

The steps in the LOI process include…
a. Early FAA/Sponsor Coordination. Any sponsor interested in pursuing an LOI must contact their ADO as early as possible, generally at least five to six months before the LOI request deadline of March 1. The ADO must then brief the sponsor on all aspects of LOIs, including the LOI request process, evaluation criteria and submission requirements. The ADO is the primary contact for the sponsor regarding an LOI.
b. Joint Meeting. The ADO has the option to hold a joint meeting so that the ADO, the regional office, APP-510, the sponsor, and the sponsor's consultant understand the purpose and scope of the project, FAA authority and policy, and sponsor financial needs, schedules, and responsibilities. This joint meeting will normally include a discussion of the evaluation criteria including the relationship between the FAA's Terminal Area Forecast (TAF) and the sponsor's forecast assumptions and level of effort to be used in their financial planning and Benefit-Cost Analysis.
c. Benefit-Cost Analysis. The FAA recommends that sponsors submit the Benefit-Cost Analysis (BCA) for the proposed action to the ADO as far in advance of the LOI request as possible, but no later than March 1. This is because the review of the BCA may take more than six months and could delay the LOI decision. The BCA process for capacity projects is contained in Paragraph 3-14.
d. ADO Notification to APP-510. Per FAA policy, APP-510 requests a list of LOI candidates from the regional offices early in the fiscal year. Regional offices must coordinate with the ADOs and provide the list to APP-510 in the time frame requested by APP-510. In addition, the ADO must notify the regional office, and the regional office must notify APP-510 promptly when a sponsor that is not on this list expresses interest in obtaining an LOI. Preliminary information provided to APP-510 must include a general description of the project, the estimated cost, the proposed schedules for construction and reimbursement, and an indication of whether the project is a good candidate for an LOI.
e. Sponsor Submits LOI Request. It is FAA policy for sponsors to submit LOI requests to the ADO on or before March 1. The LOI review committee will normally review and either approve or disapprove the request by end of the same fiscal year. If a sponsor submits an LOI request after March 1, the LOI review committee will normally not review the request until the following fiscal year. The LOI review committee also has the option to review incomplete or partial requests on a case by case basis.
f. ADO Review. The ADO and regional office will prepare an overview, assessment and preliminary recommendation for Headquarters consideration, within 30 days of receiving an LOI request unless an extension is requested of and approved by APP-510 in advance. The ADO and regional office must contact APP-510 to request the preferred format for this recommendation.

Table 6-4 LOI Approval/Disapproval Process

The steps in the LOI process include…
g. Committee Review. The FAA will establish a national-level committee each year to review LOI requests to ensure that all statutory requirements have been met, and to advise the FAA Associate Administrator for Airports (ARP-1) and the FAA Director of the Office of Airport Planning and Programming (APP-1) on the selection of LOI proposals. The committee will be composed of representatives of the FAA Office of Airports (ARP). The committee is chaired by APP-510 and may include ARP representatives from APP-510, APP-520, and an ARP regional division manager (or designee) with no LOI candidate in the current year. The committee may also include representation by the FAA Office of Aviation Policy and Plans (APO), the FAA Air Traffic Organization (ATO) and/or other FAA offices, as determined by the committee chair. The committee may recommend that APP-510 request additional information from the sponsor, and/or additional assessment from the ADO or regional office.
h. LOI Selection. After receiving the recommendations from the LOI Committee, ARP-1 makes the official selections.
i. LOI Programming. After ARP-1 selects the sponsors that will receive LOIs, APP-500 coordinates the LOI sign-off package within Headquarters including the FAA Office of Government and Industry Affairs (AGI). The LOI package contains a draft of the LOI documents, a memorandum from APP-500 to the regional division manager containing documentation of the FAA's review and proposed LOI approval, and the unsigned congressional notification letters.
j. DOT Office of the Secretary (OST) Coordination. APP-500 forwards the LOI sign-off package electronically to OST including the unsigned congressional notification letter.
k. Congressional Notification. For new or amended LOIs that exceed $10,000,000, OST must send the signed congressional notification letter to the Committees on Appropriations of the Senate and the House of Representatives; the Committee on Commerce, Science, and Transportation of the Senate; and the Committee on Public Works and Transportation of the House of Representatives of the proposed LOI. This requirement is contained in a note in the Department of Transportation and Related Agencies Appropriations Act, 1993 (Public Law 102-388, title III § 320). The FAA interpretation of this requirement is that OST must notify these parties of the new or amended LOI and may proceed if no legislation is passed to prohibit the LOI within 30 days after notification. OST electronically notifies the FAA when this process is complete.
l. LOI Decision Memorandum. When the congressional notification process is complete, APP-510 will officially prepare a memorandum that establishes the LOI funding level and provides supporting information for the decision.
m. LOI Offer. The ADO will issue the LOI to the sponsor when APP-510 has provided the ADO with the LOI Decision Memorandum. The same official who normally signs a grant offer for the FAA will be the official who signs the LOI offer.
n. ADO Issues Initial LOI Grant. APP-520 normally schedules the initial LOI grant for the fiscal year following the year in which the application was received unless the approval of the LOI is delayed beyond the end of the fiscal year. However, as allowed by 49 USC § 47110(e)(6), APP-500 has the option to schedule the initial LOI grant during the same fiscal year that the LOI is approved.

6-6. Sponsor LOI Submission Requirements.

Per FAA policy, sponsors must submit one hard copy and one electronic copy of the documentation listed in Table 6-5to the ADO.

Table 6-5 Sponsor LOI Submission Requirements

The sponsor must provide…
a. Executive Summary. This summary must include an overview of the existing airport's facilities and operating environment, along with an overview of the proposed capital project or program to be supported by the requested LOI.
b. Description of the Existing Problem. This description must focus on the capacity constraints of the existing facilities relative to existing or projected demand.
c. Description of System-Wide Airport Capacity Enhancement (required for Large and Medium hub airports). This description must include how the proposed action will meet the requirement for a significant system-wide capacity enhancement. Sponsors must not construe this to refer solely to throughput capacity for major airline hubs. Sponsors may rely upon any one or more of several factors that the FAA may then consider in making this determination. Examples include, but are not limited to, physical airport improvements that result in or support one or more of the following. Reduction of required minimums will not generally be considered sufficient evidence, on its own, to represent a significant system-wide airport capacity enhancement. **(1)** Capacity increase in annual operations, either in Visual Flight Rules (VFR) or Instrument Flight Rules (IFR) conditions or both. **(2)** Increase in airport service volume by the addition of a new runway, elimination of runway intersections or other airfield operational constraints. For large hub airports, sponsors will need to demonstrate that the capacity benefits are real, measurable and significant. **(3)** Increase in hourly *call rates* (i.e., local tower acceptance rates in terms of hourly arrivals and departures). **(4)** Delay reduction relative to existing or forecast levels, either at the individual airport or among multiple airports serving the same geographic area. **(5)** Projected delay savings as a percentage of existing delays at the airport, or as a percentage of all national delays. **(6)** Delay reduction that can be shown to enhance airline schedule reliability, even if the project does not lead to substantial increases in operations. **(7)** Creation of an additional arrival stream or reduced dependency between arrival streams. **(8)** Regional distribution of demand from one or more capacity-constrained or significantly delayed airports. **(9)** Elimination of a demonstrable capacity constraint for an airport serving a region or metropolitan area where population or economic growth has exceeded growth in available departing seats or cargo capacity. **(10)** Increase in the maximum stage-length that can be served from the airport.

Table 6-5 Sponsor LOI Submission Requirements

The sponsor must provide…
d. Description of the Sponsor's Forecast. This description must include both summary and detailed information on enplanements and operations. If applicable, the description must also include details of the fleet mix, the peak hour airfield mix by class, and the airline load factors. The sponsor must provide a clear discussion of how the forecasts were derived and their key assumptions.
e. Description of the Proposed Action. This description must focus on how the proposed action will provide additional capacity. For large and medium hub airports, this description must also explain how the proposed action will enhance system-wide airport capacity.
f. Description of the Capital Cost Estimates. This description must delineate the level of planning or design data on which the estimates are based, the source of quantities and unit costs, and the levels of contingency assigned. The ADO has the option to request that the sponsor secure the services of an independent consultant to conduct a formal cost estimate review, including unbiased quantity calculations, estimates of unit costs and determination of appropriate contingency levels based on the level of design information available.
g. Status of and Schedule for the ALP Approval. If the sponsor has not submitted an ALP depicting the proposed action by March 1, the sponsor must provide a schedule to the ADO that clearly demonstrate that the FAA will be able to approve the ALP by September 30. This schedule must include sufficient time for full aeronautical study and determination and all required coordination.
h. Status of Environmental Decision and Required Federal/State Permits. Both approval of the proposed action on the airport layout plan and issuance of the LOI are considered Federal actions subject to the requirements of the National Environmental Policy Act (NEPA). If the FAA has not completed the environmental decision or the sponsor has not obtained the required federal/state permits, the sponsor must provide a status/schedule of when this will be accomplished. The schedule must demonstrate the FAA has sufficient time to issue an environmental decision by August 1. If the schedule suggests a date later than August 1, the sponsor must consider deferring the LOI request to the following year.
i. LOI Application Financial Template and Supporting Documentation. The sponsor must include the requested LOI amounts (payment schedule) and all other proposed sources and amounts for the proposed action in the FAA Form 5100-139, LOI Application Financial Template (see the AIP Forms link in Appendix B). If additional approvals or other actions are required for any funding type (such as for Passenger Facility Charges or General Airport Revenue Bonds) the sponsor must include the status. Using the LOI Application Financial Template, the sponsor must clearly outline all sources and amounts of financing for the proposed project as well as for all other anticipated capital projects during the life of the LOI request. The Finance Template also provides an opportunity for sponsors to discuss alternative LOI disbursement schedules and how those alternatives might impact the overall financial plan.

Table 6-5 Sponsor LOI Submission Requirements

The sponsor must provide…
j. Description of the Financial Plan for Other Capital Needs. The sponsor must discuss other significant capital costs identified in the LOI Application Financial Template beyond the proposed action to enable the FAA to identify whether the funding plan for the proposed action is viable. The FAA does not normally review the impact on rates and charges, landing fees, cost per enplanement, or the ability to attract or retain airline service, which is driven by many factors including underlying market strength, the competitive environment, revenue potential, and other operating expenses beyond airport rates and charges The FAA will also not generally consider current or projected Cost Per Enplanement (CPE) or landing fee projections as a means of comparing one airport to another. CPE is highly dependent upon a number of factors, including the ownership and operation of passenger terminals, the nature of each airport's use and lease agreement, and the structure of each airport's rates and charges. However, the FAA may consider analyses and conclusions prepared by other industry experts or stakeholders, including municipal bond rating agencies, bond insurers, institutional investors and the airlines themselves, particularly in cases where the airlines have already approved the issuance of bonds in support of the proposed action. Therefore, it can be beneficial for sponsors to provide such analyses or documentation as part of the LOI request.
k. Benefit-Cost Analysis (BCA). If not submitted previously, the sponsor must include a BCA that was prepared in accordance with the FAA Airport Benefit-Cost Analysis Guidance (see Appendix B for link). This information must include all data necessary to explain the assumptions regarding existing and proposed facilities and operational parameters. **(1) Detailed Simulation Modeling.** For a project over $50 million dollars, it may also be beneficial for the sponsor to conduct detailed simulation modeling. The FAA has the option to require this if they feel the complexity of the project warrants it. **(2) Financial Data for Required Proposed Action Components.** Sponsors must recognize that the total project cost used in the BCA may be more than that of the proposed LOI project. This is necessary if the additional project components are required to realize the benefits of the proposed action. For example, for an LOI for a new runway, the BCA may need to include taxiway and other airfield improvements to realize the benefits of the new runway. **(3) Sensitivity Analysis**. For the purposes of the LOI financial analysis, sponsors are also encouraged to consider evaluating the effects of more conservative growth assumptions, to minimize the potential for overestimating future airport activity levels and capacity benefits, as well as other funding sources including PFCs and entitlements. This may be accomplished by the sponsor through sensitivity analyses designed to quantify the overall effect of slower growth rates or alternative assumptions regarding demand.
l. Additional Information for New and Replacement Airports. The FAA may require additional information about any aspect of the proposed development, including phasing of the new or replacement airport, the facility's functional and operational position relative to other existing or proposed airport facilities, population and demographic patterns, air service (including passenger and cargo) and underlying economic activity.
m. Additional Information for High Federal Participation. Sponsors seeking the highest levels of Federal participation may be required to provide additional documentation of forecast demand levels, sensitivity analyses, and/or more heavily backend loaded disbursement schedules.

6-7. LOI Evaluation Criteria.

49 USC § 47115(d)(1) contains the six criteria that the FAA must use when selecting system-wide capacity enhancement projects for discretionary funding. The FAA interprets 49 USC § 47110(e) to require the FAA to use these criteria, which are listed in Table 6-6, for LOI evaluation.

The FAA will also consider the sponsor's requested rate of Federal participation relative to comparable projects, airport revenue diversion or other compliance issues, and grandfathered payments to other governmental offices.

The ADO and regional office must contact APP-510 to request the preferred format for the ADO and region office evaluation and recommendation to ensure a consistent review process throughout the FAA Office of Airports.

Table 6-6 Evaluation Criteria for LOI Requests

The criteria, which are used by the FAA to evaluate LOI requests, are….	
a.	The effect that the project will have on overall national transportation system capacity.
b.	The benefit and cost of the project, including, in the case of a project at a reliever airport, the number of operations projected to be diverted from a primary airport to the reliever airport as a result of the project, as well as the cost savings projected to be realized by users of the local airport system.
c.	The financial commitment from non-United States Government sources to preserve or improve airport capacity.
d.	The airport improvement priorities of the States to the extent such priorities are not in conflict with items a and b in this table.
e.	The projected growth in the number of passengers or aircraft that will be using the airport at which the project will be carried out.
f.	The ability of the project to foster United States competitiveness in securing global air cargo activity at a United States airport.

6-8. LOI Offer Package.

An LOI Offer Package is normally comprised of two documents, the cover letter and the LOI Offer. Both documents are developed by APP-510 and signed by the ADO. Per FAA policy required contents of this LOI Offer are included in Table 6-7.

In addition, the ADO has the option to include any additional guidance or information that the ADO deems necessary. For example, the ADO may wish to include a spreadsheet with a detailed cost breakdown that shows the project component costs that are included in the proposed action and/or a project sketch that clearly shows the approved project components.

Table 6-7 LOI Offer Contents

APP-510 must include the following information in the LOI Offer…
a. LOI Number. Currently this is based on the regional office's three letter code, the fiscal year of issuance, and a sequential number (for example: AGL-88-02 is the second LOI issued by AGL in FY 1988). APP-510 is in the process of converting this to the following format, which must be used by the ADO once officially adopted: 3-AA-BBBB-LCC-YYYY *Where:* 3 = The program code for AIP. AA-BBBB = The NPIAS code for the airport. L = A single letter designator indicating this is an LOI. CC = The sequential number of LOIs issued for that airport. YYYY = The fiscal year in which the LOI is executed.
b. Airport Name.
c. Project Description. A brief, but complete, project description.
d. Maximum Federal Funding. The maximum amount of Federal funds which will be made available for the project.
e. Funding Schedule. A schedule of reimbursements by fiscal year and type of funds (apportionment and/or discretionary).
f. Sponsor Compliance Statement. A statement that the sponsor must be in compliance with all statutory and administrative requirements.
g. *Intent* to Obligate Statement. A statement that the LOI is not considered an obligation of the United States, must not be deemed an administrative commitment for funding, but only an intention to obligate from future budget authority as such funds become available.
h. Amendment Statement. A statement that the LOI, with sufficient justification, may be amended to adjust the maximum Federal obligation, the payment schedule, or both.
i. Requirements before Proceeding Statement. A statement that if a sponsor proceeds without satisfying all of the *statutory and administrative requirements* associated with an actual grant, the commitment to reimburse the sponsor under the LOI may be voided.
j. Failure to Comply with Federal Requirements Statement. A statement that a sponsor's failure to comply with all Federal requirements could lead to a requirement to repay paid amounts and jeopardize later reimbursements.

6-9. LOI Grant Administration.

Once an LOI is approved, the ADO is responsible for issuing and administering the associated grants according to the approved LOI payment schedule. This includes ensuring that all of the sponsor (Chapter 2), project (Chapter 3), funding (Chapter 4), and grant (Chapter 5) requirements have been met.

The ADO has the flexibility to determine which phases of the LOI project will be included in each grant as long as the ADO is able to accurately track what is being funded.

The sponsor is required to maintain a current record of the physical and financial status of the project. The ADO has the option to request this information in the format and frequency the ADO determines is necessary.

6-10. LOI Amendments.

There must be ongoing ADO involvement as each project phase is completed, as subsequent phases come to bid, and as successive grants are issued under the LOI. In extremely limited circumstances, the FAA may amend an LOI in future years to adjust the total maximum Federal obligation, the schedule of payments, or both. Circumstances that warrant an amendment include, but are not limited to, a change in project cost related to unforeseen Federal or state regulatory requirements, changes in project timing or scope, or changes in future obligating authority. APP-510 approval is required prior to an ADO amending an LOI.

The sponsor has a responsibility to estimate and manage costs as accurately as possible. In cases where the sponsor faces unexpected increases in costs driven solely by economic conditions, sponsors must not view a possible LOI amendment as the first solution to be considered, particularly since the FAA's overall participation rate will generally represent a small percentage of overall funding.

The sponsor must either consider cost reduction or deferral measures, and/or pursue the full range of funding sources available. The FAA has the option to issue an amendment, but such amendments will be the exception rather than the rule and may result in the FAA extending the LOI payment schedule beyond the term of the original schedule and/or revising the level of Federal participation.

In cases where an amendment would exceed $10 million or 20% of the original LOI discretionary funding amount, APP-510 has the option to require the sponsor to submit updated information. If such an amendment is approved, APP-510 must initiate an DOT Office of the Secretary (OST) and congressional notification process as if a new LOI were being awarded.

An LOI is amended by the FAA issuing an LOI amendment letter. The LOI amendment is not subject to grant amendment rules.

The LOI amendment may or may not affect the individual grants previously issued under the LOI. If an individual grants is affected, the amendment rules in Section 7 of Chapter 5 will apply.

6-11. LOI Closeout.

Once all of the associated LOI grants are closed, the ADO must officially close the LOI in the automated AIP system.

6-12. Revising, Suspending, or Terminating an LOI.

If a sponsor proceeds without satisfying all of the *statutory and administrative requirements* associated with an actual grant, the FAA has the option to suspend or terminate the LOI. In the rare instance a sponsor proposes a substantial revision to the approved project, the ADO must contact APP-500 to determine the appropriate course of action. Sponsors must fully understand that failure to comply with all Federal requirements could lead to a requirement to repay paid amounts and jeopardize later reimbursements.

Section 2. State Block Grant.

6-13. General.

The State Block Grant Program allows states to assume the administrative responsibilities that are traditionally performed by the ADO for nonprimary airports. These functions are specifically defined by a state block grant agreement that is executed between the state and the FAA once the state is chosen for participation in the program.

6-14. Limited State Flexibility.

The State Block Grant Program provides participating states with some flexibility in the administration of the state apportionment and sponsor entitlement for the airports in their program. The limitations on this flexibility are outlined in the Memorandum of Agreement that is signed by both the state and the FAA. Unless specifically waived in the Memorandum of Agreement, the state must ensure that all applicable statutory and regulatory requirements discussed in this Handbook are met.

6-15. Responsibilities Retained by the FAA.

The FAA has determined that there are key functions that must be retained by the FAA. The ADO cannot delegate these functions to the state. The current version of Advisory Circular 150/5100-21, State Block Grant Program, contains a list of the specific functions that must be retained by the FAA.

6-16. Legislative History and List of Participants.

49 USC § 47128 authorizes the FAA to allow no more than ten states to administer block grants for the nonprimary airports in the state. Table 6-8contains the history of the State Block Grant Program and Table 6-9contains a list of the approved State Block Grant participants.

Table 6-8 History of the State Block Grant Program

Date	Major Milestones
December 30, 1987	The Airport and Airway Safety and Capacity Expansion Act of 1987 was passed. Section 116 of this Act amended the Airport and Airway Improvement Act of 1982, by adding new section 534 entitled State Block Grant Pilot Program.
October 20, 1988	14 CFR part 156, State Block Grant Pilot Program, was published in 53 Federal Register 41303 (October 20, 1988).
October 1, 1989	This State Block Grant Pilot Program became effective and allowed three states to apply for the program.
October 31, 1992	The Airport and Airway Safety, Capacity, Noise Improvement, and Intermodal Transportation Act of 1992 extended the State Block Grant Program until 1996. This Act also authorized the issuance of block grants for fiscal years 1993 through 1996 in four additional states (for a total of seven).
October 9, 1996	The Federal Aviation Reauthorization Act of 1996 authorized one new state block grant participant (for a total of eight) and made the State Block Grant Program a permanent feature of AIP.
April 4, 2000	The Wendell H. Ford Aviation Investment and Reform Act for the 21st Century (AIR-21) authorized one new state block grant participant in fiscal years 2000 and 2001 (for a total of nine) and an additional state block grant participant after fiscal year 2001 (for a total of ten).

Table 6-9 State Block Grant Participants

State	Fiscal Year Selected	Fiscal Year Exited Program
(1) Illinois	1989	N/A
(2) Missouri	1989	N/A
(3) North Carolina	1989	N/A
(4) Michigan	1993	N/A
(5) New Jersey (no longer in program)	1993	2003
(6) Texas	1993	N/A
(7) Wisconsin	1993	N/A
(8) Tennessee	1997	N/A
(9) Pennsylvania	1997	N/A
(10) New Hampshire	2008	N/A
(11) Georgia	2008	N/A

6-17. State Block Grant Program Application.

The FAA will accept applications for the State Block Grant Program at any time – there is no set application schedule. To do this, the state simply sends a letter of request with the information listed in Table 6-10 to the ADO.

States are encouraged to check with the FAA prior to submitting an application to determine if there are any available slots in the program. If a state is accepted into the program, the state can remain in the program until the state decides it wants to withdraw from the program or the FAA suspends or terminates its participation.

Table 6-10 State Block Grant Application Information

The state must describe…
a. The state's organization and capabilities to effectively administer a block grant program.
b. The state's airport system planning process.
c. The state's programming process.
d. The state's willingness and ability to comply with the State Block Grant Agreement.
e. The state's willingness and ability to comply with the National Environmental Policy Act of 1969, state and local environmental policy acts, Executive orders, agency regulations, and other Federal environmental requirements.
f. The state's willingness and ability to provide all program information that is requested by the FAA.
g. The state's process for determining which projects will be funded, including: **(1)** The state's process for ensuring that critical safety, and security, and other national aviation priority needs will be met. **(1)** The state's system for determining a project's priority and how this process is consistent with the FAA's national priority system.

6-18. FAA Selection of State Block Grant Participants.

49 USC § 47128 (b) and (c) describe the criteria that the FAA must use to select a state for the State Block Grant Program. These criteria are listed in Table 6-11. The ADO must review the state's request against the criteria in this table and make a recommendation to the regional office. The regional office must then make a recommendation to APP-520, who is responsible for the final determination. The ADO is responsible for notifying the sponsor of the FAA's official determination.

Table 6-11 State Block Grant Selection Criteria

In order for the FAA to select a state for the State Block Grant Program, the FAA must determine that…
a. The state has an organization capable of effectively administering a block grant program.
b. The state uses a satisfactory airport system planning process.
c. The state uses a programming process that is acceptable to the FAA.
d. The state is both willing and able to comply with the State Block Grant Agreement.
e. The state is both willing and able to provide all program information that is requested by the FAA.
f. The state is both willing and able to comply with the National Environmental Policy Act, state and local environmental policy acts, Executive orders, agency regulations, and other Federal environmental requirements.
g. The state uses a satisfactory process for determining which projects will be funded, including: **(1)** A satisfactory process for ensuring that critical safety, and security, and other national aviation priority needs will be met. **(2)** A satisfactory process for determining a project's priority that is consistent with the FAA's national priority system.

6-19. Memorandum of Agreement.

As of the publication date of this Handbook, it is FAA policy that the state and the FAA must enter into a State Block Grant Program Memorandum of Agreement in order for the state to qualify for grants under the program. The FAA officially documents that the selection criteria have been met by executing a State Block Grant Program Memorandum of Agreement (MOA) with the state. The ADO must retain a signed original of the executed State Block Grant Program MOA and forward a copy to APP-520.

This MOA outlines the responsibilities of the state and the FAA under the State Block Grant Program. The current version of Advisory Circular 150/5100-21, State Block Grant Program, contains the standard template that the ADOs must use for this MOA.

6-20. Grant Assurances.

The ADO must include Aviation Block Grant Program Assurances as part of all state block grants as well as a set of Airport Sponsors Assurances and Non-Airport Sponsors Undertaking Noise Compatibility Program Projects Assurances (see Appendix B for link to these assurances).

Per Aviation Block Grant Assurance #4, the state and or the associated airport owner receiving a subgrant are obligated to the Airport Sponsors Assurances or Non-Airport Sponsors Undertaking Noise Compatibility Program Projects Assurances as appropriate to the individual project. The state accomplishes this by attaching the applicable assurances to the subgrant agreement.

6-21. Criteria for an Airport to be in the State Block Grant Program.

Table 6-12contains the criteria for an airport to be in the State Block Grant Program.

The state and the FAA have the option to allow specific airports to remain outside of the State Block Grant Program. This would mean that the administrative responsibilities would remain in the ADO. Both the state and the FAA must agree with this action, otherwise the airport must stay within the State Block Grant Program. The ADO must include a list of these airports in the MOA and must include the process for these airports to compete for state apportionment. In addition, the ADO provides this list annually to APP-520.

Table 6-12 Criteria for an Airport to be in the State Block Grant Program

In order for an airport to be eligible to be in a State Block Grant Program, the airport must be…	
a.	In the National Plan of Integrated Airport System (NPIAS).
b.	Within the state boundaries of a block grant state.
c.	An existing (not planned) public-use airport.
d.	A general aviation, reliever, or nonprimary commercial service airport (primary airports are not eligible).
e.	Listed as a block grant airport in the State Block Grant Program Memorandum of Agreement between the state and the FAA.

6-22. ADO Right to Issue Grants Directly to Airports in the State Block Grant Program.

The ADO retains the right to issue a grant directly to an airport in the state block grant program. This grant would use small airport funds per 49 USC § 47116(c). This would be a rare occurrence and would normally only be done by the ADO to address an unusual circumstance.

6-23. Decision Authority for Discretionary Funds.

As of the publication date of this Handbook, it is FAA policy that the FAA retains the decision authority regarding which airport projects will be funded with discretionary funds within the block grant. The current APP-520 discretionary policy applies to these projects.

6-24. Grant Federal Share.

The Federal share rules for state block grants and their associated subgrants are included in Table 4-7.

6-25. Grant and Amendment Processes.

The ADO issues one or more grants to the state each year for the state's available nonprimary entitlement, state apportionment, and cargo funds (where applicable). The ADO also has the option of issuing additional grants to the state with discretionary funds at specific airports. The state then issues the individual subgrants to nonprimary airports in its state.

The grant and amendment processes for the State Block Grant Program are incorporated in the applicable sections of Chapter 6Chapter 5.

6-26. Transfer of AIP Funding between Airports.

The rules for transferring funding between airports within the State Block Grant Program are included in Table 6-13.

Table 6-13 AIP Funding Transfer Rules for the State Block Grant Program

For the following funding type…	The following transfer rules apply…
a. State Apportionment	None.
b. Passenger, Cargo, and Nonprimary Entitlement	The state must follow the transfer rules provided in Paragraph 4-11.
c. Discretionary	Per FAA policy, states are prohibited from transferring ADO assigned discretionary to another airport or project, or using unused discretionary for new projects. This policy aligns the use of discretionary between state block and non-state block grants.

6-27. Project Eligibility and Allowable Costs.

AIP requirements for airport project eligibility and allowable cost (see Chapter 3) are the same for states receiving a block grant as they would be if the ADO were administering the project. The ADO has the final call in eligibility determinations where there are disagreements with the states interpretation.

6-28. Project Administrative Costs.

The state can charge for *project administrative* costs that would otherwise be an allowable cost for the *project* (normally done by a consultant or other hired company). Paragraph 3-60 outlines the requirements for the cost for a state's employee's time as well as overhead or indirect costs (overhead or indirect costs include anything more than direct employee's time).

6-29. Program Administration Costs.

State *program administration* costs are unallowable. These are costs that would be incurred by the ADO if the FAA were administering the grant. Per FAA Policy, exemptions from this prohibition are not considered.

6-30. Required Timeframe to Issue Subgrants.

It is FAA policy that the state must issue all funding to subgrants in a manner that allows them to meet the period of performance and closeout deadlines contained in Paragraph 5-57. If the state does not do this, the ADO has the option to unilaterally deobligate the funds and close the grant.

6-31. Grant/Project Oversight.

Unless otherwise stated in the State Block Grant Program Memorandum of Agreement, all of the project and grant oversight requirements in Section 5 of Chapter 5 apply.

6-32. Grant Payments.

The rules for grant payments for state block grants are included in Section 6 of Chapter 5.

6-33. Grant Closeout.

The rules for grant payments for state block grants are included in Section 8 of Chapter 5.

6-34. Program Review by the FAA.

The FAA has the option of reviewing a state's administration of the State Block Grant Program. The state must provide all documentation requested by the FAA.

6-35. Accounting and Audits.

States must have an accounting system that accurately reflects expenditures of all funding within a state block grant. State block grants and subgrants are subject to the same audit requirements as any other AIP grant.

6-36. Suspension/Termination of a Grant Issued under the State Block Grant Program.

The FAA has the option to suspend and/or terminate any state block grant. The procedures are listed in Section 9 of Chapter 5. The ADO must assume the administrative responsibilities

associated with the suspended grant. This is not the same as suspending a state from the program, which is covered in Paragraph 6-37.

6-37. Suspension of a State from the State Block Grant Program.

The FAA has the option to suspend a state from the State Block Grant Program if the FAA determines the State fails to comply with mandatory requirements. The FAA must use the criteria used for admitting the state to the program (see Paragraph 6-18) and the conditions in the State Block Grant Memorandum of Agreement to make this decision. The FAA must also work with the state to determine a course for corrective action and a time frame in which it will be completed by the state.

If a state is suspended, the ADO must assume the administrative responsibilities associated with the program. Prior to suspension, the ADO must obtain copies of all subgrants (open or closed).

6-38. Removal or Voluntary Withdrawal from the State Block Grant Program.

States may voluntarily withdraw from the State Block Grant Program. In addition, failure of states to comply with block grant conditions or regional agreements may result in the FAA removing the state from the program.

a. APP-1, APP-500, and ACO-100 Coordination/Concurrence. The ADO must coordinate and obtain concurrence from APP-1, APP-500, and ACO-100 prior to initiating withdrawal or removal of a state from the State Block Grant Program.

b. Negotiations on Transfer of Responsibilities from State to ADO. Unless the FAA determines otherwise, the ADO and the state have the option to negotiate the transfer of responsibilities from the state to the ADO. For instance, the ADO might request to phase out the state's participation in the program starting with selected categories of airports or projects.

c. Amendment to Memorandum of Agreement. The State Block Grant Program Memorandum of Agreement must be amended to reflect the transfer of responsibilities to the ADO. The memorandum must list all open and closed subgrants and must indicate what documentation must be transferred to the ADO. The ADO must obtain APP-500 and ACO-100 concurrence with the memorandum before it is executed by the ADO.

d. State Reapplication after Termination. A terminated state can reapply to be in the State Block Grant Program under the same application procedures for a new applicant.

Section 3. Military Airport Program.

6-39. General.

The Military Airport Program (MAP) allows the FAA to give grants to civil sponsors of joint-use military airfields or former military airports.

6-40. AIP Funding.

49 USC § 47117(e)(1)(B) designates a 4% set-aside of AIP discretionary funds that the FAA may use towards projects at MAP designated airports. The FAA normally directs MAP funding towards those specific projects that will allow a MAP designated airport to successfully transition from military to civilian use.

6-41. Designation Authority.

49 USC § 47118(a) allows the FAA to designate up to 15 current or former military airfields in the Military Airport Program. These airports can receive grants to help convert them to civilian use or to reduce congestion. Per 49 USC § 47118(g), three of the 15 airports may be general aviation airports and the remaining twelve must be commercial service or reliever airports.

6-42. Original MAP Designation Duration.

The FAA has the option to designate an airport as a MAP airport for one to five years per 49 USC § 47118(d). Per FAA policy, the FAA must evaluate the conversion needs of the airport in the sponsor's capital development plan to determine the appropriate length of designation.

6-43. Redesignation Duration.

Previously designated airports may apply for redesignation of additional terms not to exceed a five year per term per 49 USC § 47118(d). Those airports must meet current MAP requirements and, per FAA policy, have remaining MAP eligible projects that were not funded by the FAA. The FAA's goal is to graduate MAP airports to regular AIP participation by successfully converting these airports to civilian airport operations.

6-44. Requirements.

Sponsors must submit documentation that clearly shows they meet the 49 USC § 47118 and FAA policy requirements listed in Table 6-14.

Table 6-14 MAP Requirements

For the following requirement…	The following criteria apply…
a. System Benefits	Per 49 USC § 47118(c), the proposed projects will accomplish at least one of the following: **(1)** Reduce delays at an airport with more than 20,000 hours of annual delays in commercial passenger aircraft takeoffs and landings. **(2)** Enhance airport and air traffic control system capacity in a metropolitan area or reduce current and projected flight delays. **(3)** Preserve or enhance minimum airfield infrastructure facilities at former military airports to support emergency diversionary operations for transoceanic flights in locations where both of the following criteria are met: **(a)** The location is within United States jurisdiction or control. **(b)** The location has a demonstrable lack of diversionary airports within the distance or flight-time required by regulations governing transoceanic flights.
b. Current or Former Military Airport	Per 49 USC § 47118(a), the airport is either a current or former military airport under at least one of the following conditions: **(1)** The airport was closed or realigned under Section 201 of the Defense Authorization Amendments and Base Closure and Realignment Act, and/or Section 2905 of the Defense Base Closure and Realignment Act of 1990 (Installations Approved for Closure by the Defense Base Realignment and Closure Commissions). Only public agencies qualify under these acts. **(2)** The airport was closed or realigned under 10 USC § 2687 as excess property. These are bases announced for closure by the Department of Defense after September 30, 1977 (this is the date of announcement for closure and not the date the property was deeded to the sponsor). Only public agencies qualify under this regulation. **(3)** The airport is a commercial service or reliever airport that is a military installation with both military and civil aircraft operations (also called a joint use airport). Per 49 USC § 47118(g), a joint use airport that is not a commercial service or reliever airport is not eligible under MAP unless the airport meets conditions (1) or (2) above.
c. Public-Use Airport	Per 49 USC § 47105(b)(2), the airport is a public-use airport (see the definition Appendix A for the criteria) in the National Plan of Integrated Airport Systems.
d. MAP Slots are Available	Per 49 USC § 47118(a) and § 47118(g), three of the 15 airports may be general aviation airports and the remaining twelve must be commercial service or reliever airports.

Table 6-14 MAP Requirements

For the following requirement…	The following criteria apply…
e. Eligible Sponsor	The sponsor is an eligible sponsor per the requirements of the Act (see Chapter 2 for a listing of the requirements).
f. Airport Layout Plan	Per 49 USC § 47107(a)(16), the airport has an FAA approved airport layout plan.
g. Capital Improvement Plan	Per FAA policy, the sponsor has a five-year capital improvement plan that includes all eligible AIP projects that can be funded with MAP and AIP.
h. Environmental Requirements	Per FAA policy, the environmental review necessary to convey the property, enter into a long-term lease, or finalize a joint-use agreement must have been completed. The military department conveying or leasing the property, or entering into a joint-use agreement, has the lead responsibility for this environmental review. Per FAA policy, the environmental reviews for each specific MAP project are separate processes. These environmental reviews must meet the normal AIP requirements and timeframes.
i. Good Title	Per 49 USC § 47106(b), the sponsor has to have good title. Per FAA policy, good title requirements are as follows: **(1) Former Military Airport.** The sponsor must hold or will hold satisfactory title, a long-term lease in furtherance of conveyance of property for airport purposes, or a long term interim lease more than 20 years or longer to the property on which the civil airport is being located. This is because the lease term must be longer than the grant assurances for AIP construction projects. Documentation that an application for surplus or BRAC airport property has been accepted by the Federal government is sufficient to indicate the eligible sponsor holds or will hold satisfactory title or a long-term lease. In addition, the sponsor must possess all necessary property rights prior to accepting a grant for a proposed project. **(2) Current Military Airport**. The sponsor must have an existing joint-use agreement with the military department having jurisdiction over the airport. If the sponsor is a first time applicant, the sponsor must submit a copy of the existing joint-use agreement no later than the time of the application. This is necessary to permit the ADO to issue grants to the sponsor. In addition, the sponsor must possess all necessary property rights prior to accepting a grant for a proposed project.

Table 6-14 MAP Requirements

For the following requirement…	The following criteria apply…
j. Marketing Plan	For a commercial service airport to qualify for redesignation, it is FAA policy that the sponsor must provide a reanalysis of their original business/marketing plans (for example, a plan previously funded by the Department of Defense Office of Economic Adjustment or the original Master Plan for the airport) and prepare a report. If there is no existing business/marketing plan, the sponsor must develop a business/marketing plan or strategy. The report must contain all of the following information: **(1)** Whether the original business/marketing plan is still appropriate. **(2)** Whether the airport is continuing to work towards the goals established in the business/marketing plan. **(3)** How the MAP projects contained in the application contribute to the goals of the sponsor's marketing plan. **(4)** If the business/marketing plan no longer applies to the current goals of the airport, how the airport has altered the business/marketing plan. Specifically, how have they established a new direction for the facility, how projects contained in the MAP application aid in the completion of the new direction and goals, and by what date they anticipate completing the MAP projects.

6-45. Typical MAP Projects.

The FAA will normally only consider MAP funding for projects that aid in the conversion of a military or former military facility to civilian use. These projects can include revenue generating projects that may not normally be eligible at the airport. These projects can also include lower priority AIP project that would not compete well for regular discretionary funding. A list of the MAP project requirements is contained in Appendix T.

It is FAA policy to use regular discretionary or entitlement funding, not MAP funding, for projects that compete well for discretionary funding or are not necessary to convert the airport to civilian use. Some examples of projects that APP-520 would anticipate an ADO use regular AIP funding are in Table 6-15.

Table 6-15 Examples of Projects That May Not Be Suitable for MAP Funding

The following project…	May not be suitable for MAP funding because…
a. Runway rehabilitation	This type of project normally competes well for regular AIP funding.
b. Runway extension	This type of project is normally not necessary to convert the airport to civilian use (most military runways are a suitable length for civilian use).

6-46. Use of Regular AIP on a MAP Designated Airport.

MAP designated airport projects are not limited to MAP funding. They may also qualify for other AIP funding if they meet all associated project eligibility and justification requirements. In fact, it is FAA policy that the ADO not recommend an airport for the MAP program unless the ADO is willing to support the airport's needs for higher priority projects with regular discretionary funding (if necessary).

6-47. MAP Funding Limitations.

Per 49 USC § 47118(e), total MAP funding may not exceed $7 million per year per airport for terminal projects. Per 49 USC § 47118(f), total MAP funding may not exceed $7 million per year per airport for construction, improvement, or repair of airport surface parking lots, fuel farms, utilities, hangars and air cargo terminal building facilities, only if the hangar or air cargo terminal building facility is 50,000 square feet or less.

6-48. Reimbursement with Discretionary.

Per 49 USC § 47118(f)(2), the FAA has the option to use discretionary to reimburse approved MAP projects if the sponsor incurred the costs during fiscal years 2003 and 2004.

6-49. Application Process.

Every year, the FAA publishes the information that a sponsor must submit if it wants to be designated or redesignated into the MAP program. The publication also announces the number of available MAP slots and the factors that the FAA will use to evaluate the MAP candidates for that fiscal year.

Each fiscal year, APP-520 will provide the regional offices and ADOs with instructions for the current internal MAP application review process.

Section 4. Innovative Finance Demonstration Program.

6-50. Legislative History and References.

The legislative history of the innovative finance demonstration program is outlined in Table 6-16. This program has been retained without change in subsequent legislation under 49 USC § 47135.

Table 6-16 Innovative Finance Demonstration Program Legislative History

The following legislation…	Provided the following…
a. Section 148 of the Federal Aviation Reauthorization Act of 1996	Established the program and allowed the FAA to approve applications for 10 airport development projects.
b. Section 132 of AIR -21 (Wendell H. Ford Aviation Investment and Reform Act for the 21st Century)	Allowed the FAA to approve applications for 20 airport development projects during fiscal years 2000-2003.
c. Section 156 Vision 100 – Century of Aviation Reauthorization Act	Allowed the FAA to approve applications for 20 airport development projects beginning in fiscal year 2004 and beyond.

6-51. Program Rules.

The rules for the innovative finance demonstration program are included in Table 6-17.

Table 6-17 Innovative Finance Demonstration Program Rules

The current Innovative Finance Demonstration Program rules include…
a. Eligible Airports. Per 49 USC § 47135(a), the program is open to all airports except large and medium hub airports. Only 20 airport development projects may be approved beginning in fiscal year 2004.
b. No Guarantee of Debt Instruments. Per 49 USC § 47135(c)(1), FAA approval of the project does not (directly or indirectly) create a guarantee by the United States Government of any airport debt instrument.

Table 6-17 Innovative Finance Demonstration Program Rules

The current Innovative Finance Demonstration Program rules include…
c. Allowable Innovative Techniques. Per 49 USC § 47135(c)(2), the program is limited to the following innovative techniques. **(1)** Payment of interest. **(2)** Commercial bond insurance and other credit enhancement associated with airport bonds for eligible airport development. Per FAA policy, this may include underwriting fees. **(3)** Flexible non-Federal matching requirements. (A) This may include increased local and state shares using contribution from private sources. (B) The FAA has determined that this technique has been adequately tested; therefore, the FAA is less inclined to pursue future uses of these techniques. **(4)** Use of entitlement and state apportionment funds to pay principal and interest costs for terminal development if the costs were incurred before December 12, 2003 (the date of the enactment of Vision 100 – Century of Aviation Reauthorization Act). The FAA has determined that this technique has been adequately tested. Therefore the FAA is less inclined to pursue future uses of these techniques.
d. Justification. Per FAA policy, the sponsor must demonstrate that the innovative finance proposal will result in cost savings or improved performance of the national aviation system. For instance, it might show that the airport development would either not be built or would be built earlier than would have been possible without the program.
e. Application Deadline. Per FAA policy, sponsors may submit an innovative finance demonstration application to the ADO at any time unless otherwise established by APP-500.
f. Project Selections. Per FAA policy, ADOs must forward all applications to APP-500 for their review. APP-500 will approve or disapprove all project applications.
g. Normal AIP Requirements. Per FAA policy, all other applicable AIP sponsor, funding, project, and grant rules apply. Changes to FAA standards will not be considered under this program.
h. Additional Sponsor Reporting. Per FAA policy, sponsors must submit all additional documentation and reporting as required by the ADO.

Section 5. Voluntary Airport Low Emission Program (VALE).

6-52. Legislative History.

In fiscal year 2004, Sections 151, 158 and 159 of Vision 100 – Century of Aviation Reauthorization Act established a voluntary program to reduce airport ground emissions at commercial service airports located in nonattainment and maintenance areas designated by the U.S. Environmental Protection Agency.

6-53. Legislative References.

Table 6-18 contains the legislative references applicable to the VALE program.

Table 6-18 VALE Legislative References

The following…	Provides...
a. 49 USC § 47102(3)(K) and § 47102(3)(L)	The language that makes certain VALE projects eligible as airport development.
b. 49 USC § 47110(b)(6)	Guidance on VALE project funding restrictions.
c. 49 USC § 47117(e)(1)(A)	Guidance on the use of noise and environmental set aside funding.
d. 49 USC § 47139	Guidance on emission credits for air quality projects.
e. 49 USC § 47140	Guidance on the airport ground support equipment emissions retrofit pilot program.

6-54. Purpose and General Overview.

The goal of the Voluntary Airport Low Emission (VALE) Program is to improve airport air quality by providing commercial service airports with grants to acquire low emission vehicles and infrastructure. The VALE Program helps airport sponsors meet their general conformity obligations under the Clean Air Act (42 USC § 7401, et. Seq.). It also assists state planning to meet health-based national ambient air quality standards.

The airports must be located in nonattainment or maintenance areas designated by the Environmental Protection Agency (EPA) per 49 USC § 47140(b). Some of the key equipment requirements are that the equipment must provide cleaner technology then the conventional equipment, be airport-owned, provide the best achievable emissions reductions based on EPA standards, and rely exclusively on alternative fuels that are substantially non-petroleum based (as defined by the U.S. Department of Energy, not excluding hybrid systems). Typical projects include gate electrification, boiler pollution control devices, and new or retrofitted low emission vehicles and ground support equipment.

6-55. Available Guidance.

The authorizing legislation requires the FAA to publish program guidance in areas of project eligibility, how air quality benefits are demonstrated, and how sponsors receive appropriate airport emission reduction credits. Specific program guidance is contained in the VALE Program Technical Report (see Appendix B for link). Associated guidance on airport emission reduction credits is contained in the EPA Report, Guidance on Airport Emission Reduction Credits for Early Measures through Voluntary Airport Low Emission Programs, which is available on the same website.

6-56. Application and Grant Process.

Sponsors interested in applying for VALE grants must submit a project application as outlined in the VALE Technical Report. VALE requirements and special conditions supplement AIP requirements and grant assurances unless otherwise stated in VALE guidance. The automated AIP system contains the current available special conditions. Sponsors must submit VALE applications concurrently to the ADO, regional office and APP-400. VALE grants are processed similarly to other AIP grants.

APP-400 determines funding priority primarily on the basis of project cost-effectiveness, as defined by project lifetime emission reductions per dollar spent.

6-57. Project Funding Requirements.

Appendix S includes the funding requirements for environmental planning/mitigation projects, including VALE projects.

Section 6. Zero Emission Vehicle and Infrastructure Pilot Program.

6-58. Legislative History.

In fiscal year 2012, Section 511 of the FAA Modernization and Reform Act of 2012 (Public Law 112-95) added a pilot program for zero emission vehicles and infrastructure.

6-59. Legislative References.

Table 6-19 contains the legislative references applicable to the zero emission vehicle and infrastructure pilot program.

Table 6-19 Zero Emission Vehicle and Infrastructure Pilot Program Legislative References

The following…	Provides...
49 USC § 47117	Guidance on the use of set aside funding for these projects. (*Note: The only set aside discretionary funding that the FAA anticipates using toward these projects is Noise and Environmental Set Aside funding, even though 49 USC § 47117 includes MAP and Reliever Set Aside funding.*)
49 USC § 47136a	Guidance on zero emission airport vehicles and infrastructure. (Note that this section is *after* 49 USC § 47136, not part of it.)

6-60. Purpose.

The goal of the Zero Emission Vehicle and Infrastructure Pilot Program is to improve airport air quality by providing eligible airports with grants to purchase zero emission airport vehicles and infrastructure.

6-61. Available Guidance.

Specific program guidance is contained in the Zero Emissions Airport Vehicle and Infrastructure Pilot Program Technical Guidance (see Appendix B for link).

6-62. Application and Grant Process.

ADOs and regional offices must contact APP-400 for application information and APP-500 for grant information.

6-63. Project Funding Requirements.

Appendix S includes the funding requirements for environmental planning/mitigation projects, including zero emission airport vehicles and infrastructure projects. The Federal share for these projects is restricted to 50% per 49 USC § 47136a(d). These projects are eligible for noise and environmental set aside funding per 49 USC § 47136a(a), as further discussed in Paragraph 4-6.

Section 7. Program to Increase Energy Efficiency of Airport Power Sources.

6-64. Legislative History.

In fiscal year 2012, Section 512 of the FAA Modernization and Reform Act of 2012 (Public Law 112-95) added a program for certain projects that increase the energy efficiency of airport power sources. This legislation simply made these projects eligible for AIP. The legislation did *not* make these projects eligible for any special set aside funding (including the noise and environmental set aside).

6-65. Legislative References.

Table 6-20 contains the legislative references applicable to the program to increase the energy efficiency of airport power sources.

Table 6-20 Program to Increase the Energy Efficiency of Airport Power Sources Legislative References

The following…	Provides...
49 USC § 47140a	Guidance on increasing the energy efficiency of airport power sources. (Note that this section is *after* 49 USC § 47140, not part of it.)

6-66. Purpose.

The goal of the program to increase the energy efficiency of airport power sources.

6-67. Available Guidance.

As of the publication date of this Handbook, APP-400 was developing guidance for the program to increase the energy efficiency of airport power sources. Until this new guidance is published, ADOs and regional offices must contact APP-400 for guidance.

6-68. Application and Grant Process.

As of the publication date of this Handbook, APP-400 was developing guidance for the program to increase the energy efficiency of airport power sources. Until this new guidance is published, ADOs and regional offices must contact APP-400 for application information and APP-500 for grant information.

6-69. Funding and Federal Share.

Because 49 USC § 47117(e)(1)(A) limits the funding of the noise and environmental set-aside to specific projects, projects to increase the energy efficiency of airport power sources are *not* eligible for noise and environmental set aside funding. In addition, the airport's regular Federal share applies.

6-70. Project Funding Requirements.

Appendix S includes the funding requirements for environmental planning/mitigation projects, including airport energy assessments and projects to increase the energy efficiency of airport power sources.

Section 8. Airport Development Rights Pilot Program.

6-71. Legislative History.

In fiscal year 2004, Section 152 of Vision 100 – Century of Aviation Reauthorization Act created a pilot program for the purchase of development rights for up to 10 privately-owned public-use airports. The rules for this pilot program are provided for in 49 USC § 47138. This pilot program allows the FAA to issue a grant to a state (or a political subdivision of the state) for the purchase of airport development rights to ensure the airport property will continue to be available for use as a public use airport in perpetuity (in this case, *public use airport* means that the airport is open to the public). Through this pilot program, the FAA will evaluate the merits of purchasing airport development rights instead of the purchase of fee simple interests for the airports.

6-72. Rules of the Pilot Program.

The rules and requirements of the pilot program are outlined in Table 6-21.

Table 6-21 Rules for the Airport Development Rights Pilot Program

The requirements for…	Include…
a. The Number of Participants	**(1)** Per 49 USC § 47138(e), the FAA is only allowed to issue grants to purchase airport development rights at 10 airports under this pilot program.
b. The Airport and Airport Owner	**(1)** Per 49 USC § 47138(a), the airport must be a privately-owned public-use airport. **(2)** Per FAA policy, the airport owner must have filed a notice with the ADO in accordance with 14 CFR part 157, Notice of Construction, Alteration, Activation, and Deactivation of Airports, indicating that the airport status is privately-owned, public-use. **(3)** 49 USC § 47138 does not require the airport to meet the privately-owned public-use airport requirements in 49 USC § 47102(22)(B) or to be in the National Plan of Integrated Airports (NPIAS). **(4)** Per FAA policy, the airport owner must not have any existing grant obligations requiring the airport to remain open.
c. The Grant Sponsor	**(1)** Per 49 USC § 47138(a), the sponsor must be a state or a political subdivision of a state (such as a city, municipality, or state agency) in the same state as the airport.
d. The Grant Purpose	**(1)** Per 49 USC § 47138(b)(1)(A), the airport property must continue to be available for use as a public airport (in this case, public airport means that the airport is open to the public). **(2)** Per 49 USC § 47138(b)(1)(B), the airport must remain a public use airport in perpetuity.
e. Requesting Participation	**(1)** Per FAA policy, the FAA may contact potentially interested owners and/or sponsors at any time and informally invite them to express interest in the pilot program. **(2)** Per FAA policy, the sponsor must express interest in a letter to the FAA. If the airport owner does not cosign the letter, then the sponsor must indicate that the airport owner has agreed in the sponsor's letter.
f. The Selection	**(1)** Per FAA policy, the regional office will send a joint ADO/regional office recommendation to APP-500. APP-500 is the selecting office. Once an airport has been selected, the ADO will inform the sponsor of the selection and request a grant application.

Table 6-21 Rules for the Airport Development Rights Pilot Program

The requirements for…	Include…
g. The Grant Application	**(1)** 49 USC § 47138(c) requires that the FAA set the requirements for the grant application and approval procedures. **(2)** Per FAA policy, the sponsor must use the standard grant application as discussed in Paragraph 5-19. **(3)** Per FAA policy, grant application must include a property inventory map (Exhibit A) that is approved by both the sponsor and the airport owner and clearly shows the land and development subject to the agreement. **(4)** Per FAA policy, the airport owner must provide a letter to the FAA describing its concept for ownership and operation of the airport over the next ten years. **(5)** Per FAA policy, if the airport owner does not operate the airport, the airport owner must provide a copy of the associated lease or agreement. **(6)** Per FAA policy, the ADO must determine whether the costs of the proposed grant are less than buying the airport outright. The issuance of the grant documents a positive determination by the ADO. **(7)** Per FAA policy, the sponsor must provide a signed certification from their attorney as outlined in Table 6-22. **(8)** The FAA has the option of not issuing a grant for the purchase of airport development rights if the FAA determines that it is not in the best interest of the Federal government or that the requirements will not be met.
h. Option for FAA Site Visit	**(1)** Per FAA policy, airport owner must agree to allow a site inspection by the FAA and sponsor prior to the grant being issued.
i. FAA Coordination	**(1)** Per FAA policy, the ADO must discuss the terms and conditions of the pilot program with the airport owner as well as the sponsor to ensure both parties understand their obligations.
j. Acquisition	**(1)** Per FAA policy, the FAA, sponsor, and airport owner must follow the same policies and procedures for airport acquisition in fee simple as contained in Appendix Q. This includes meeting the requirements of the current version of FAA Order 5100.37, Land Acquisition and Relocation Assistance for Airport Projects, and in the current version of Advisory Circular 150/5100-17, Land Acquisition and Relocation Assistance for Airport Improvement Program Assisted Projects.
k. AIP Fund Types	**(1)** 49 USC § 47138(a) allows of all types of apportionment and entitlement funds available to the sponsor that are listed under 49 USC § 47114 to be used on this type of grant.
l. AIP Federal Share	**(1)** Per 49 USC § 47138(b)(2), the Federal share is limited to 90% of the costs to acquire the development rights.

Table 6-21 Rules for the Airport Development Rights Pilot Program

The requirements for…	Include…
m. AIP Grant Description and Amount	**(1)** Per FAA policy, the FAA can only compensate the airport owner for the market value of the development rights sold based on an acceptable before and after appraisal. Under this appraisal method, the market value of the development rights conveyed is appraised at the difference between the market value of the property for continued airport use and the current market value of the property for some other development. **(2)** Per FAA policy, planning costs to prepare the Exhibit A and/or associated documentation are allowable project formulation costs under the grant (not as a separate grant). **(3)** Per FAA policy, the property interests must be for a complete airfield or those combined parcels that collectively allow the airport to serve as a public-use airport. The property interests cannot be for only select areas of the airport (such as only the runway protection zones).
n. Grant Template	**(1)** The ADO must consult with APP-500 on how the standard grant template must be modified for a grant of this type.
o. Instrument Recording the Purchase of Airport Development Rights	**(1)** Per FAA policy, the instrument recording the purchase of airport development rights must include all of the terms and conditions listed in Table 6-23. The instrument recording the purchase of development rights is the document evidencing the purchase of the airport development rights by the sponsor, and the easement or covenant given by the airport owner that the airport must remain a public-use airport in perpetuity.
p. Grant Assurances	**(1)** Per FAA policy, the standard grant assurances must not be included in the grant. Instead, the requirements in Table 6-23 must be contained in the instrument recording the purchase of airport development rights, as discussed above.
q. Final Payment	**(1)** Per FAA policy, ADO must not allow the payment for the full amount of the grant until the instrument recording the purchase of development rights and easement has been recorded in the local registry of deeds and land transfers in compliance with local law.
r. Release of Purchase Rights and Covenant	**(1)** Per 49 USC § 47138(d), the state or political subdivision may not transfer or dispose of the development rights unless the FAA determines that it is in the best interest of the Federal government.
s. Advisory Circular for Airport Safety Self-Inspection	**(1)** Per FAA policy, the ADO has the option to provide the airport owner/operator with the current version of Advisory Circular 150/5200-18, Airport Safety Self Inspection.

Table 6-22 Required Sponsor's Attorney Certification Language

The following certification language must be completed and signed by the sponsor's attorney…
CERTIFICATE OF SPONSOR'S ATTORNEY I, _____ , acting as Attorney for the Sponsor do hereby certify that in my opinion the Sponsor is empowered to file the Application for Federal Assistance for the purchase of development rights in accordance with Title 49, United States Code, section 47138, under the laws of the State of _____and has the authority from its governing body. Further, the actions taken by said sponsor and sponsor's representative has been duly authorized and that the execution thereof is in all respects due and proper and in accordance with the laws of the said State. Dated at _____ (location) this _____ day of _____, _____. By: _____ (Signature of Sponsor's Attorney)

Table 6-23 Requirements for the Instrument Recording the Purchase of Airport Development Rights

Per FAA policy, the instrument recording the purchase of airport development rights must include the following terms and conditions…
a. Exhibit A (Property Inventory Map). Parcels of land obligated under the development rights agreement must be described on the Exhibit A. The Exhibit A must be approved by both the sponsor and the airport owner.
b. Notice to Airmen. The airport owner must promptly notify pilots of any condition affecting aeronautical use of the airport property.
c. Acquisition of Development Rights. The acquisition of development rights by the sponsor is for the right to develop and use the property depicted on the Exhibit A for a purpose other than as an airport open to the public or enhancing convenience of aviation activities. The purpose of the acquisition of development rights is to ensure that the airport will continue to be available as a public use airport (in this case, *public use airport* means that the airport is open to the public).
d. Hazardous Substance. The FAA and state (or political subdivision of the state) do not assume any right to control the means by which the airport owner complies with restrictions on airport property; and do not assume any liability for discharge of a hazardous substance.
e. Public-Use Airport in Perpetuity. The airport owner, for good and valuable consideration, must grant the sponsor an easement or covenant that the airport must remain open to the public for use as an airport in perpetuity. Such easement or covenant must be in effect in perpetuity unless modified or released with the approval of the FAA.
f. Modification or Release of Purchased Rights and Covenant. The sponsor must not modify, transfer, or disposal of the airport development rights unless the FAA has made a written determination that the action is in the best interest of the Federal government.

Table 6-23 Requirements for the Instrument Recording the Purchase of Airport Development Rights

Per FAA policy, the instrument recording the purchase of airport development rights must include the following terms and conditions…
g. Recordation. The sponsor must record the instrument evidencing the purchase of development rights and the granting of the easement or covenant that the airport must remain open to the public for use as an airport in perpetuity, in the local registry of deeds and land transfers in compliance with local law.
h. Sponsor's Obligation for Airport Operation. The sponsor may be obligated to operate and maintain the airport if it is closed during other than periods of temporary climatic conditions that interfere with safe operation and maintenance. The airport owner and sponsor agree that in the event the airport owner discontinues safe airport operation and maintenance, the sponsor, in consultation with the FAA, may be required to assume that obligation.
i. Airport Owner's Obligation for Airport Operation in Perpetuity. The airport owner or its successor is obligated to own the airport and operate it as an airport except for periods of temporary climatic conditions that interfere with safe operation and maintenance. In the event the airport owner discontinues safe airport operation and maintenance, the airport owner must notify the FAA within 24 hours.
j. Enforcement of Development Rights by the FAA. The instrument recording the purchase of development rights must grant the FAA third party beneficiary rights to enforce the easement or covenant that the airport must remain a public-use airport in perpetuity and the sponsor's obligation for airport operation.

Section 9. Redevelopment of Airport Properties Pilot Program.

6-73. Legislative History.

In fiscal year 2012, Section 822 of the FAA Modernization and Reform Act of 2012 (Public Law 112-95) created a pilot program to fund activities related to the redevelopment of airport properties purchased for airport noise compatibility. Note that the pilot program language was not incorporated into 49 USC Chapter 471, therefore the text of the pilot program can only be found in Section 822 of the FAA Modernization and Reform Act of 2012 (Public Law 112-95). As of the publication date of this Handbook, the current sunset date is September 30, 2018 per the Consolidated Appropriations Act, 2018 (Public Law 115-141).

6-74. Purpose.

The purpose of this pilot program is to expedite redevelopment of airport property purchased for noise mitigation by the airport with AIP or Passenger Facility Charge (PFC) funds.

6-75. Availability of Guidance.

Guidance for this pilot program is available in Pilot Program for Redevelopment of Airport Properties (Acquired Noise Land) (see Appendix B for link).

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Appendix A. Definitions of Terms Used in this Handbook

A-1. Definitions of Terms Used in this Handbook.

Definitions are an extremely important part of this Handbook. As with any large program, there are many words and phrases that have specific, defined meanings within the program. Table A-1 contains an alphabetical listing of the definitions used in this Handbook. The following letters are links to the appropriate alphabetical sections in Table A-1.

A	B	C	D	E	F	G	H	I	J	L	M	N	O	P	R	S	T	U	W

Table A-1 Definition of Terms Used in This Handbook

Definitions
A
Access Road. See Terminal Development. A portion of an access road or an access road can be considered *access road improvement* instead *of terminal development* is when it does not go directly to or from a terminal building.
The Act. The contents of this Handbook are based on the AIP related legislation contained in the United States Code (USC). Throughout this Handbook, the AIP related legislation under Title 49 is referred to as the *Act.* Previously, AIP was authorized by the Airport and Airway Improvement Act of 1982 (Public Law 97-248), which Congress repealed in 1994 and recodified as Title 49 § 47101, et seq. (Public Law 103-272).
Administrative Cost. Administrative costs are costs incurred in support of the general management and administration of the project, including all executive, organizational, and clerical costs rather than the specific costs like construction, or manufacturing. There are two types of Administrative Costs, Direct Administrative Costs and Indirect Administrative Costs. Direct administrative costs can be allowable costs in an AIP project if 1) it can be specifically documented to the project and 2) the ADO has approved the administrative costs in advance of incurring the administrative cost. 2 CFR part 200 (OMB Circular A-87, Appendix C) establishes the procedures for calculating administrative costs. Indirect administrative costs cannot be readily identifiable with a particular project or cost objective. Indirect administrative costs can be allowed only if the ADO has an approved Cost Allocation Plan from the cognizant agency.
ADO. For the purposes of this Handbook, ADO means the local FAA Airports District Office. In regional offices that do not have ADOs, the use of the term ADO refers to the FAA Office of Airports branch within the regional office that deals directly with the sponsors. Where other FAA offices are discussed, those offices will be specifically identified.
Aeronautical Study (Commonly Referred to as an Airspace Study). An aeronautical study is a study conducted to determine the effect a proposal has on the operation of air navigational facilities and on the safe and efficient use of navigable airspace. Aeronautical studies are also used by the FAA Office of Airports to coordinate airport construction projects and changes to Airport Layout Plans (ALPs) with the rest of the FAA.

Table A-1 Definition of Terms Used in This Handbook

Definitions
Air Carrier Airport. Per 49 USC § 47102(1), an air carrier airport is a public airport regularly served by: An air carrier certificated by the Secretary of Transportation under 49 USC § 41102 of this title (except a charter air carrier); or At least one air carrier: Operating under an exemption from section 49 USC § 41101(a)(1) that the Secretary grants; and Having at least 2,500 passenger boardings at the airport during the prior calendar year.
Airport. Per 49 USC § 47102(2), an airport is: An area of land or water used or intended to be used for the landing and taking off of aircraft; An appurtenant area used or intended to be used for airport buildings or other airport facilities or rights of way; Airport buildings and facilities located in any of those areas; Per 49 USC § 47102(2)(B), this specifically includes heliports.
Airport Development. Airport development is a legal definition in 49 USC § 47102(3). This definition contains development projects that are eligible under AIP. This list is extensive and is therefore not duplicated in this table. However, this list is reflected throughout this Handbook (most specifically in Chapter 3 and the associated appendices).
Airport Hazard. Per 49 USC § 47102(4), a structure or object of natural growth located on or near a public-use airport, or a use of land near the airport, that obstructs or otherwise is hazardous to the landing or taking off of aircraft at or from the airport. For obstructions, the FAA Air Traffic Organization (ATO) must make this determination (per the current version of FAA Order JO 7400.2, Procedures for Handling Airspace Matters).
Airport Layout Plan. As of the publication date of this Handbook, the current version of Advisory Circular 150/5070-6, Airport Master Plans, defines an airport layout plan set as a set of drawings that provides a graphic representation of the sponsor's long-term development plan for an airport. This plan must show both existing and proposed airport facilities and all proposed and existing access points used to taxi aircraft across the airport's property boundary; the approval of which is evidenced by the signature of the FAA Administrator or his duly designated representative.
Airport Master Plan. As of the publication date of this Handbook-Advisory Circular 150/5070-6, Airport Master Plans, defines airport master plan as a comprehensive study of the airport and typically describes short-, medium-, and long-term plans for airport development. Master planning studies that address major revisions are commonly referred to as master plans, while those that change only parts of the existing document and require a relatively low level of effort tend to be known as master plan updates.

Table A-1 Definition of Terms Used in This Handbook

Definitions
Airport Planning. Per 49 USC § 47102(5), airport planning means planning as defined by regulations the Secretary prescribes and includes: Integrated airport system planning. Developing an environmental management system. Developing a plan for recycling and minimizing the generation of airport solid waste, consistent with applicable state and local recycling laws, including the cost of a waste audit.
Airport Property Map. An airport property map is a drawing depicting the airport property boundary, land or property interests (including method of acquisition and type of interest), and future proposed land acquisition. The Airport Property Map is required as part of the Airport Layout Plan drawing set if any of the airport land was acquired with Federal funds or through an FAA administered land transfer program. An airport property map is not a substitute for an Exhibit A (property inventory map), unless it is prepared in accordance with the Exhibit A requirements in the current version of Advisory Circular 150/5100-17, Land Acquisition and Relocation Assistance for Airport Improvement Program Assisted Projects.
Airport Purposes. All aviation activities normally found on an airport.
Airport Revenue. The current version of FAA Order 5190.6, Airport Compliance Manual, defines airport revenue. As of the publication date of this Handbook, that definition is as follows: Airport revenue generally includes those revenues paid to or due to the airport sponsor for use of airport property by the aeronautical and nonaeronautical users of the airport. It also includes revenue from the sale of airport property and resources and revenue from state and local taxes on aviation fuel. If this definition is modified in any succeeding version of FAA Order 5190.6, the new definition must be used.
Airside Needs/Development. All development within the areas accessible to aircraft including runways, taxiways, aprons, and aircraft gates and the land adjacent to these facilities required by current FAA standards. This may include airside facilities that are not justified for AIP grant funding.
Allocation. An allocation is the FAA notification to the sponsor of the intent to obligate funds (by issuing a grant). It does not involve a transfer of funds. It is an internal administrative re-delegation of the authority to incur obligations and make expenditures.
Allotments. After the FAA receives an Office of Management and Budget (OMB) apportionment, APP-520 requests the FAA Office of Budget and Performance – Operations and Capital Execution Branch (ABP-410) to make an allotment of funds to regional offices to support previously issued planning figures. Allotments and adjustments to allotments are made throughout the year.
Allowable Cost. The cost of an item or activity that can be funded with AIP per 49 USC § 47110.
Amendments. A formal change to the terms or scope of a grant agreement.

Table A-1 Definition of Terms Used in This Handbook

Definitions
Apportionments. There are two actions referred to as apportionments in AIP. The Act requires an apportionment of funds to be made each fiscal year to sponsors and states based on formulas in the Act. This notifies sponsors and states that these funds are available for eligible work but does not involve any transfer of funds. These funds are referred to interchangeably as state or sponsor *apportionments*, *entitlements*, or *formula* funds. The second type of apportionment is made by the Office of Management and Budget (OMB) to allow the FAA to use congressionally approved AIP funds. The OMB apportionment is formally requested by the FAA, which provides a financial plan for orderly use of the funds. The OMB apportionment may contain restrictions on the use of funds, such as the amount that may be used quarterly.
Appropriation. The appropriation is the annual budget established by Congress each year. Generally speaking, the appropriation allows Federal agencies to incur obligations and make payments for specific purposes. AIP gains the ability to incur its obligations through the Contract Authority set in the Authorization. This Contract Authority, however, is subject to the terms set forth in the annual appropriation each year. This means that Congress may use the appropriation to adjust the annual AIP funding level to exceed or reduce the amount of Contract Authority designated for any year.
Authorization. The authorization is commonly referred to as the FAA *Bill* or *Reauthorization* and may be passed by Congress for one or more years. The authorization sets yearly limits on the AIP funding levels and gives the FAA *contract authority* to issue grants.
Automated AIP System. This database integrates the project planning data necessary for the NPIAS Report, the project planning data necessary for the ADOs to create a three year ACIP, and the grant data for all grants issued into one system. This is an internal FAA system. As of the publication of this Handbook, this system is the System of Airport Reporting (SOAR).
B
Based Aircraft. Per the FAA report titled General Aviation Airports: A National Asset, dated May 2012, based aircraft are aircraft that are operational and airworthy, and are based at the airport for the majority of the year. Based aircraft are single-engine, multi-engine, jets, and helicopters derived from the FAA Form 5010-1, Airport Master Record (Existing Public Use Airports), Items 90 – 93.
Bathroom or Bathing Facility. A dedicated room for toilet facilities, washing basins, and bathing facilities such as a shower or tub. Restrooms do not provide bathing facilities.
Brooks Act. A Federal law (Public Law 92-582, codified at 40 USC § 1101) passed in 1972 that requires the Federal government to use qualifications based selection (a special form of competitive negotiations) for obtaining professional services.
C
Carryover Entitlements. Entitlements that were provided in a prior fiscal year were not used and remain available for obligation for the original recipient.

Table A-1 Definition of Terms Used in This Handbook

Definitions
Capacity Project. The current version of FAA Order 5100.39, Airports Capital Improvement Plan, defines capacity projects. As of the publication date of this Handbook, that definition is as follows: Development items that improve an airport or system of airports for the primary purpose of accommodating more passengers, cargo, aircraft operations or based aircraft. If this definition is modified in the next version of FAA Order 5100.39, the new definition must be used. In cases where it is unclear if a project is capacity or standards, the ADO must obtain a joint APP-400 and APP-510 concurrence on whether the project is considered capacity.
Certified Airfield Lighting Equipment. Airfield lighting equipment that has received a third party certification that it meets the requirements in the current version of Advisory Circular 150/5345-53, Airport Lighting Equipment Certification Program, and is in the latest published addendum to Appendix 3 of this advisory circular.
Channeling Act State. Based on individual state law, typically all funds from AIP would be deposited in a state account. State legislative action may be required to release funds to individual airports.
Cognizant Agency. Per 2 CFR §§ 200.18 and 200.19 (OMB Circular A-87, Attachment A, paragraph B.6.), the Federal agency responsible for reviewing, negotiating, and approving cost allocation plans or indirect cost proposals developed under 2 CFR part 200 Subpart E (OMB Circular A-87) on behalf of all Federal agencies.
Commercial Service Airport. Per 49 USC § 47102(7), a commercial service airport means a public airport in a state that the Secretary determines has at least 2,500 passenger boardings each year and is receiving scheduled passenger aircraft service.
Compatible Land Use. Per 14 CFR § 150.7, the use of land that is normally compatible with the outdoor noise environment (or an adequately attenuated noise level reduction for any indoor activities involved) at the location because the yearly day-night average sound level is at or below that identified for that or similar use under appendix A (Table 1) of 14 CFR part 150.
Condemnation. The governmental authority to take private property for public use is known as the power of eminent domain, commonly referred as condemnation. Most airport owners have this power which is an inherent power of the local government derived from its sovereignty, as well as a power implied from Article 1, Section 8, and the Tenth Amendment of the Constitution. The property owner's right to just compensation (fair market value payment) for property taken by condemnation is reserved in the Fifth Amendment to the Constitution.
Congressional Notification. Senate and House members are notified of proposed grants in their states or districts before others are notified. The Talking Points are used to inform Senate and House members about the proposed grant. An allocation is not made until this *congressional release* process is completed by DOT Office of the Secretary (OST) and FAA headquarters offices. In some cases, certain Senate and House committees are also given advance notification.
Continuing Resolution. This is legislation that allows an agency to continue funding programs, usually at levels equal to the previous year, while Congress continues work towards annual appropriations legislation and is generally of a shorter duration than a fiscal year. Due to the nature of the AIP formulas, the FAA needs to compute the different entitlements and discretionary funding (including set-asides) to match the funding available for each continuing resolution.

Table A-1 Definition of Terms Used in This Handbook

Definitions
Cost Allocation Plan. Sponsors that want to include a portion of their indirect costs in a project must have an approved Cost Allocation Plan. The Cost Allocation Plan must be prepared according to the requirements of 2 CFR part 200 Subpart E (OMB Circular A-87, Cost Principles for State, Local, and Indian Tribal Governments). It is the formal means by which a sponsor identifies indirect costs (i.e., overhead) and assigns them to the benefiting departments/funds on a reasonable and consistent basis. The Cost Allocation Plan must be approved by the cognizant agency of the Federal government. The approved indirect costs can only be applied to the sponsor's employee's salaries and wages, and cannot be applied to pass-through costs in the grant such as construction costs, consultant contracts, and equipment costs; or to other non-salary and wages costs.
Cost Analysis. A cost analysis is the evaluation of individual elements of a project, such as labor or materials that make up the total price, to determine if the elements are allowable, directly related to the project, and reasonable.
Critical Aircraft. The critical aircraft is the most demanding airplane which is currently, or is planned to use a runway, taxiway, apron or other aeronautical facility on a regular basis. The weight, wingspan, performance characteristics of the airplane impact the design of the facility. The ADO must use the current version of Advisory Circular 150/5000-17, Critical Aircraft and Regular Use Determination to determine the critical aircraft for specific projects and airport types.
D
DELPHI. The Department of Transportation's official accounting system of record. Each sponsor with a grant must have a designated user of the system in order to receive reimbursements on their grants. A grant cannot be issued until the sponsor has an account in the DELPHI system.
Design Standards. The engineering, design, and construction standards for various airport-related equipment, facilities, and structures defined by the FAA via the advisory circulars.
Design-Build Contracting. Per 49 USC § 47142, design-build contracting is defined as an agreement that provides for both design and construction of a project by a contractor.
Direct Cost. A direct cost is a cost that is only attributable to the work being performed. The payments for construction contract work for the project, contract design services of a design firm and contract planning services under a planning project are examples of direct costs. Project administrative costs are also considered direct costs (such as legal review, contract administration and oversight activities being performed specifically for the project) if the basis for the cost is easily identifiable through methods such as time cards used in cost accounting or other methods of capturing actual direct costs. Further information on direct cost can be found in 2 CFR § 200.413 (Attachment A, Section E of OMB Circular A-87, Cost Principles for State, Local, and Indian Tribal Governments).
Discretionary Funds. Discretionary funds are funds remaining within the obligation limitation after the entitlements are calculated. These funds, subject to certain restrictions in legislation, are available for distribution at the discretion of the FAA. The discretionary funds are not required to be distributed to specific states and sponsors. 49 USC § 47115 and 49 USC § 47117 provide statutory set-asides and minimum funding for noise, military, capacity, safety and security.

Table A-1 Definition of Terms Used in This Handbook

Definitions
Drawdown. A series of payments made during a project reflecting the progress that is being made on the project.
E
Earmark. A legislative provision that directs funds to be spent on specific projects. Note that these projects must still be eligible and justified before the ADO can approve funding.
Easement. Per Black's Law Dictionary (9th ed. 2009), an interest in land owned by another person, consisting in the right to use or control the land, or an area above or below it, for a specific limited purpose (such as to cross it for access to a public road). See Paragraph 2-15 in the current version of Advisory Circular 150/5100-17, Land Acquisition and Relocation Assistance for Airport Improvement (AIP) Assisted Projects, for description of typical *avigation* easement rights.
Enplanement. Revenue passenger boardings at airports (including heliport or seaplane base) that receive scheduled or nonscheduled passenger service. The definition also includes passengers who continue on an aircraft in international flight that stops at an airport in any of the 50 states for a non-traffic purpose, such as refueling or aircraft maintenance rather than passenger activity.
Exclusionary Practices. Exclusionary practices are designed to eliminate rivals, enabling the surviving firm to reap the benefit of less competition. Exclusionary practices are prohibited on AIP projects and the costs associated with exclusionary practices are not allowable.
Exclusive Use (of an area such as a taxiway, apron, or hangar). Per the current version of Advisory Circular 150/5190-6, Exclusive Rights at Federally Obligated Airports, [an area] that by express agreement, from the imposition of unreasonable standards or requirements, or by any other means excludes others from using the area. A taxiway that leads only to a single hangar is an exclusive use taxiway. If this definition is modified in a succeeding version of the advisory circular, the new definition must be used.
Exclusive Right. Per the current version of Advisory Circular 150/5190-6, Exclusive Rights at Federally Obligated Airports, a power, privilege, or other right excluding or debarring another from enjoying or exercising a like power, privilege, or right. An exclusive right can be conferred either by express agreement, by the imposition of unreasonable standards or requirements, or by any other means. Such a right conferred on one or more parties, but excluding others from enjoying or exercising a similar right or rights, would be an exclusive right. If this definition is modified in a succeeding version of the advisory circular, the new definition must be used.
Exhibit A. A detailed airport property inventory map that is prepared in accordance with the current version of Advisory Circular 150/5100-17, Land Acquisition and Relocation Assistance for Airport Improvement Program Assisted Projects. Note that this is a more detailed drawing than the airport property map that is sometimes required in the airport layout plan drawing set, and an Exhibit A can be substituted for an airport property inventory map.

Table A-1 Definition of Terms Used in This Handbook

Definitions
F
Fair Market Value. Per 44 CFR § 79.2, the amount in cash, or on terms reasonably equivalent to cash, for which in all probability the property would have sold on the effective date of the appraisal, after a reasonable exposure time on the open competitive market, from a willing and reasonably knowledgeable seller to a willing and reasonably knowledgeable buyer, with neither acting under any compulsion to buy or sell, giving due consideration to all available economic uses of the property at the time of the appraisal. Different variations may apply when purchasing personal property.
Fee Simple. Per Black's Law Dictionary (9th ed. 2009), an interest in land that, being the broadest property interest allowed by law, endures until the current holder dies without heirs.
Future Development. Development of a facility more than five years from the date of the approval of the ALP or the land acquisition. For the ALP, future development is shown in 5, 10, and 15 year time frames.
G
General Aviation Airport. Per 49 USC § 47102(8) a public airport that is located in a state that, as determined by the Secretary: Does not have scheduled service; or Has scheduled service with less than 2,500 passenger boardings each year.
Grant Agreement. Under 31 USC § 6304 and § 6305 (Federal Grant and Cooperative Agreement Act of 1977), a grant is a legal instrument used by a Federal agency to provide aid to carry out a public purpose as authorized by a United States law.
Grant Assurances. The obligations airport owners, planning agencies, or other organizations undertake when they accept funds from FAA-administered airport financial assistance programs. These obligations require the recipients to maintain and operate their facilities safely and efficiently and in accordance with specified conditions. The assurances appear either in the application for Federal assistance and become part of the final grant offer or in restrictive covenants to property deeds. The duration of these obligations depends on the type of recipient, the useful life of the facility being developed, and other conditions stipulated in the assurances.
Grantee. Many of the Federal documents referenced in the Handbook use the term *grantee*. For purposes of this Handbook, it is the same as sponsor.
H
Handbook. The current version of FAA Order 5100.38, Airport Improvement Program.
Hangar. A hangar is a facility for the storage of aircraft (self-maintenance is allowed as defined in the current version of FAA Order 5190-6, FAA Airport Compliance Manual). Throughout this document, the term *hangar* applies only to aircraft storage facilities. This differs from a fixed based operator building or aircraft maintenance facility, both of which have revenue generating maintenance activities.

Table A-1 Definition of Terms Used in This Handbook

Definitions
Hub Airport. 49 USC § 47102 defines hub airports as commercial service airports meeting the following criteria. *Large hub* airports enplane at least 1% of the national annual passenger boardings per 49 USC § 47102(11). *Medium hub* airports enplane at least 0.25% but less than 1% of the national annual passenger boardings per 49 USC § 47102(13). *Small hub* airports enplane at least 0.05% but less than 0.25% of the national annual passenger boardings per 49 USC § 47102(25). *Non hub* airports enplane less than 0.05% of the national annual passenger boardings per 49 USC § 47102(14).
I
Incurred Cost. An expense that has been incurred during the course of business, and is a liability until it is paid.
Indian Tribe. Per 25 USC § 5130, the term "Indian tribe" means any Indian or Alaska Native tribe, band, nation, pueblo, village, or community that the Secretary of the Interior acknowledges to exist as an Indian tribe. Pursuant to the Federally Recognized Indian Tribe List Act of 1994, the Secretary of the Interior publishes a list of federally acknowledged tribes.
Indirect Cost. Indirect costs are those that have been incurred for common or joint objectives and cannot be readily identified with a particular final cost objective. For a public agency, indirect costs may include the costs of utilities or rent that are allocated to different departments of the agency.
Indirect Cost Allocation Plan. See *Cost Allocation Plan*.
Insular Areas. The Insular Areas of the United States includes American Samoa, Guam, the Northern Mariana Islands, Puerto Rico, and the United States Virgin Islands.
J
Joint Use Airport. Per 49 USC § 47175(7), an airport owned by the Department of Defense, at which both military and civilian aircraft make shared use of the airfield.
L
Landside Needs/Development. All development on airport property that does not meet the definition of airside needs/development.
Large Hub Airport. Per 49 USC § 47102(11), a commercial service airport that enplanes at least 1% of the national annual passenger boardings.
Letter of Intent. A formal document issued by the FAA that states an intention to provide future funding.
M

Table A-1 Definition of Terms Used in This Handbook

Definitions
Maintenance. A comprehensive definition, including the differentiation between maintenance, rehabilitation, reconstruction, and replacement and examples are provided in Paragraph 3-6.
Medium Hub Airport. Per 49 USC § 47102(13), a commercial service airport that enplanes at least 0.25% but less than 1% of the national annual passenger boardings.
Metropolitan Area. Per OMB Bulletin 06-01 Corrected, Update of Statistical Area Definitions and Guidance on Their Uses, the Office of Management and Budget (OMB) defines metropolitan areas . The OMB published the Standards for Defining Metropolitan and Micropolitan Statistical Areas in a 65 Federal Register 82228 (December 27, 2000). Metropolitan areas comprise metropolitan statistical areas (MSAs), consolidated metropolitan statistical areas (CMSAs), and primary metropolitan statistical areas (PMSAs). These areas are defined in terms of entire counties, except in the six New England States where they are defined in terms of cities and towns. New England county metropolitan areas (NECMAs) are an alternative set of county-based areas defined for New England States.
Metropolitan Planning Agency. An organization whose is purpose is to ensure that government funding for transportation projects within a metropolitan area is based on continuing, cooperative, and comprehensive planning. Typical metropolitan planning agencies include metropolitan planning organizations (MPOs), councils of government, and regional planning commissions.
Modification to Standards. Any FAA approved change to FAA standards (other than dimensional standards for runway safety areas) applicable to an airport design, construction, or equipment procurement project.
N
NAVAID. An acronym for navigation aid. From the FAA Pilot/Controller Glossary, a navigational aid is any visual or electronic device airborne or on the surface which provides point-to-point guidance information or position data to aircraft in flight.
Near-Term Development. Per the current version of Advisory Circular 150/5070-6, Airport Master Plans, within the next five years.
Noncompatible Land Use. Per 14 CFR § 150.7, the use of land that normally not compatible with the outdoor noise environment (or an adequately attenuated noise level reduction for any indoor activities involved) at the location because the yearly day-night average sound level is at or below that identified for that or similar use under appendix A (Table 1) of 14 CFR part 150.
Nonhub Airport. Per 49 USC § 47102(14), a commercial service airport that enplanes less than 0.05% of the national annual passenger boardings.
Non-Federal Entity. Per 2 CFR § 200.69, a state, local government, Indian tribe, institution of higher education (IHE), or nonprofit organization that carries out a Federal award as a recipient or subrecipient. These were previously referred to as grantees and subgrantees.
Non-Primary Airport. An airport that is not a primary airport as defined under 49 USC § 47102(16). In other words, an airport that has 10,000 or less passenger enplanements each year.

Table A-1 Definition of Terms Used in This Handbook

Definitions
O
Obligations. The execution (signing) of a grant agreement with a sponsor constitutes an obligation of the Federal government to eventually pay the amount specified in the grant. Obligations of funds are processed through the FAA Office of Finance and Management, FAA Accounts Payable Section B (AMK-314) in two steps: a *reservation of funds* is made before the grant is signed, and an *obligation* is reported when the grant is signed. Total obligations for a year may never exceed the total of funds allotted to a regional office. There are *gross* and *net* obligations. Gross obligations are the total obligations of all types of funds (including recovered funds) without deducting funds recovered from old obligations. Net obligations are total obligations (including obligations of recovered funds) minus total funds recovered during the year.
Office of Management and Budget (OMB). The Federal agency responsible for providing fiscal accounting and budgeting services for the Federal government.
Order. Per the current version of FAA Order 1320.1, FAA Directives Management, directives are the primary means within the FAA to issue, establish, and describe agency policies, organization, responsibilities, methods, and procedures. Orders are permanent directives and stay in effect until canceled. *Note: Although the AIP Handbook is published as an FAA order, it provides program requirements to airports, consultants and all involved with AIP.*
OST Release Date. The DOT Office of the Secretary (OST) release date is the date that the congressional notification process is completed.
Overall Development Objective (ODO). The ODO is found in the current version of FAA Order 5100.39, Airport Capital Improvement Plan. The intent of the ODO is to recognize that many airport projects require several different projects in order to complete the overall objective. For example, a new runway project may require land acquisition, obstruction clearing and runway construction. Through the use of the ODO, the costs and effort involved with the land acquisition and obstruction clearing is captured as part of the new runway project.
P
Passenger Boardings. Per 49 USC § 47102(15), unless the context indicates otherwise, revenue passenger boardings in the United States in the prior calendar year on an aircraft in service in air commerce, as the Secretary determines under regulations the Secretary prescribes. This includes passengers who continue on an aircraft in international flight that stops at an airport in the 48 contiguous states, Alaska, or Hawaii for a nontraffic purpose. Note that *revenue passenger* is further defined in Section 3 of 14 CFR part 241, Uniform System of Accounts and Reports of Large Certificated Air Carriers.
Passenger Facility Charge. A charge approved by the FAA which is imposed by a public agency on eligible revenue passengers enplaned at a commercial service airport it controls. Public agencies may use PFC revenue to finance FAA-approved projects that meet the requirements of 49 USC § 40117. Note that *revenue passenger* is further defined in Section 3 of 14 CFR part 241, Uniform System of Accounts and Reports of Large Certificated Air Carriers.

Table A-1 Definition of Terms Used in This Handbook

Definitions
Permissive Statute. Per Black's Law Dictionary (9th edition 2009), a statute that allows certain acts but does not command them.
Precision Approach Procedure. From the FAA Pilot/Controller Glossary, a Precision Approach Procedures is a standard instrument approach procedure in which an electronic glide slope/glide path is provided, e.g., ILS (Instrument Landing System), MLS (Microwave Landing System), and PAR (Precision Approach Radar)
Price Analysis. A price analysis is a process analyzing a proposed total price without evaluating separate cost elements (including profit). The purpose is solely to ensure that a total price is fair and reasonable.
Primary Airport. Per 49 USC § 47102(16), primary airport means a commercial service airport the Secretary determines to have more than 10,000 passenger boardings each year.
Program Income or Program Revenue. Per 2 CFR § 200.80, gross income received by the recipient or subrecipient directly generated by a grant supported activity, or earned only as a result of the grant agreement during the grant period. "During the grant period" is the time between the effective date of the award and the ending date of the award reflected in the final financial report. To be considered program income, the sponsor must receive the income.
Programming. The FAA process of moving a proposed grant through all of the appropriate levels of review required prior to reserving funds for that grant.
Project. For the purposes of this Handbook, an item of work such as a runway extension or apron rehabilitation. Separate projects can be included in one grant application.
Project Cost. A cost involved in carrying out a project.
Public Agency. Per 49 USC § 47102(20), any one of the following: A state or political subdivision of a state (this includes state agencies, cities, and other municipalities). A tax-supported organization. An Indian tribe or pueblo. Except an Indian tribe or pueblo, a public agency requires specific state-enabling legislation that authorizes the agency and defines the responsibilities of the agency.
Public Airport. Per 49 USC § 47102(21), an airport used or intended to be used for public purposes that meet the following two criteria: The airport is under the control of a public agency. The area used or intended to be used for the landing, taking off, or surface maneuvering of aircraft is publicly owned.

Table A-1 Definition of Terms Used in This Handbook

Definitions
Public-Use Airport. Per 49 USC § 47102(22), a public-use airport is: A public airport; or A privately-owned airport used or intended to be used for public purposes that is: A reliever airport; or Determined by the Secretary to have at least 2,500 passenger boardings each year and to receive scheduled passenger aircraft service.
R
Reconstruction. A comprehensive definition, including the differentiation between maintenance, rehabilitation, reconstruction, and replacement and examples are provided in Paragraph 3-6.
Recoveries. As adjustments are made to grant amounts based on actual payments, funds may be recovered (deobligated) from existing obligations and reobligated for upward adjustments to existing projects and under certain circumstances may be reobligated for new projects. The amount of recoveries that may be reobligated is controlled by the Office of Management and Budget (OMB) and is communicated to regional offices in the allotment process as a *recovery ceiling*.
Rehabilitation. A comprehensive definition, including the differentiation between maintenance, rehabilitation, reconstruction, and replacement and examples are provided in Paragraph 3-6.
Regularly Scheduled Commercial Service. A 14 CFR part 121, 14 CFR part 129, or 14 CFR part 135 certificated air carrier operating on a published schedule and reporting scheduled commercial activity.
Reliever Airport. Per 49 USC § 47102(23), a reliever airport is an airport the Secretary designates to relieve congestion at a commercial service airport and to provide more general aviation access to the overall community.
Replacement. A comprehensive definition, including the differentiation between maintenance, rehabilitation, reconstruction, and replacement and examples are provided in Paragraph 3-6.
Restrooms. A dedicated room for toilet and wash basin facilities. Restrooms do not include bathing facilities such as a shower or tub (these are considered a bathroom or bathing facility).
Retainage. The money earned by a contractor but not paid to the contractor until the completion of construction or another predetermined date. The retainage is held back as assurance for the quality of the contractor's work. Per 2 CFR § 200.305(b), the ADO must not make payments to sponsors for amounts that the sponsor has retained or withheld from the contractor. 49 CFR § 26.29 requires that the retainage that is held for subcontracts must match or must not exceed the level of retainage held back from the contractor by the sponsor. (Although 49 CFR § 26.29 is the regulation for Disadvantaged Business Enterprises (DBE) in Department of Transportation Federal assistance programs, the requirements for prompt payment apply to payment to all contractors and subcontractors, and are not limited to DBE only.)

Table A-1 Definition of Terms Used in This Handbook

Definitions
Revenue Producing Aeronautical Support Facilities. Per 49 USC § 47102(24), fuel farms, hangar buildings, self-service credit card aeronautical fueling systems, air plane wash racks, major rehabilitation of a hangar owned by a sponsor, or other aeronautical support facilities that the Secretary determines will increase the revenue producing ability of the airport.
Runway Protection Zone (RPZ). Per the current version of Advisory Circular 150/5300-13, Airport Design, area at ground level prior to the threshold or beyond the runway end to enhance the safety and protection of people and property on the ground. This advisory circular defines RPZ requirements.
S
Safety/Security Equipment. Per 49 USC § 47102(3)(B)(ii), equipment, including explosive detection devices, universal access systems, and emergency call boxes, the Secretary requires by regulation for, or approves as contributing significantly to, the safety or security of individuals and property at the airport and integrated in-pavement lighting systems for runways and taxiways and other runway and taxiway incursion prevention devices.
Secretary. For the purposes of this Handbook, Secretary refers to the Secretary of the Department of Transportation. For some limited instances, Secretary may mean the Secretary of Homeland Security.
Sensitivity Analysis. For the purposes of Letter of Intent reviews, and as originally published in PGL 07-03, a sensitivity analysis is an analysis of the net impact of potential changes in key independent variables. For example, sensitivity analyses typically conducted on capital cost estimates may involve calculating the overall cost impact of an additional half-percentage point of annual cost escalation—e.g., the difference between 3.0% versus 3.5%—or the effect of a one-year delay in the overall construction schedule.
Set-Aside Funding. The AIP funding structure contains certain funding percentages or amounts that represent a minimum requirement for dedicated AIP funding. These *set-asides* include money for noise compatibility planning and projects, Military Airport Program participants, certain reliever airports and projects for capacity, safety, and security and noise projects at primary and reliever airports. Since these *set-asides* represent a minimum annual amount, the FAA calculates these categories after the apportionment of entitlement funding (which represent specific amounts). Funding remaining after entitlement funding and set-asides is referred to as remaining or *pure* discretionary.
Simplified Acquisition Threshold. Per 2 CFR 200.88, the dollar amount below which a non-Federal entity may purchase property or services using small purchase methods. The simplified acquisition threshold is set by the Federal Acquisition Regulation at 48 CFR Subpart 2.1 (Definitions) and in accordance with 41 USC § 1908. This threshold is periodically adjusted for inflation. The current threshold amount can be found in Table U-7.
Small Hub Airport. Per 49 USC § 47102(25), a commercial service airport that enplanes at least 0.05% but less than 0.25% of the national annual passenger boardings.

Table A-1 Definition of Terms Used in This Handbook

Definitions
Sponsor. A sponsor is defined in 49 USC § 47102(26) as: A *public agency* that submits to the Secretary under this subchapter an application for financial assistance; and A *private owner of a public-use airport* that submits to the Secretary under this subchapter an application for financial assistance for the airport.
Standards Projects. The current version of FAA Order 5100.39, Airports Capital Improvement Plan defines standards projects. As of the publication date of this Handbook, that definition is as follows: Projects to bring an airport up to standards recommended by the FAA based on the current design category of the airport. If this definition is modified in the next version of FAA Order 5100.39, the new definition must be used. In cases where it is unclear if a project is capacity or standards, the ADO must obtain a joint APP-400 and APP-510 concurrence on whether the project is considered capacity.
State. Per 49 USC § 47102(27), a state, for the purposes of this Handbook, is defined as a state of the United States, the District of Columbia, Puerto Rico, the Virgin Islands, American Samoa, Guam, and the Trust Territory of the Pacific Islands (Republic of the Marshall Islands, the Federated States of Micronesia, the Commonwealth of the Northern Mariana Islands, the Republic of Palau).
State Planning Agency. A state organization whose purpose is to ensure that government funding for transportation projects within a state is based on continuing, cooperative, and comprehensive planning. Typical state planning agencies include, but are not limited to, planning offices, aeronautics commissions, and departments of transportation.
Subgrant. Typically under AIP, the subgrant is the award of Federal funds to a subrecipient.
Subrecipient. Per 2 CFR § 200.93 (OMB Circular A-133, Subpart A), a non-Federal entity that expends Federal awards received from a pass-through entity to carry out a Federal program, but does not include an individual that is a beneficiary of such a program. A subrecipient may also be a recipient of other Federal awards directly from a Federal awarding agency. Typically under AIP grants, the subrecipient is the airport receiving a grant from a state in a block grant state.
Substantial Completion. Substantial completion is generally a defined term in a contract and is the stage of the project when work is sufficiently complete in accordance with the contract documents so that the sponsor can occupy or use the project for its intended purpose. The substantial completion date typically triggers: retainage release; the warranty period; determination of any actual or liquidated damages; the start of the statute of limitations; and related actions.
T

Table A-1 Definition of Terms Used in This Handbook

Definitions
Terminal Development. Per 49 USC § 47102(28), terminal development includes: An airport passenger terminal building, including terminal gates. Access roads servicing exclusively airport traffic that leads directly to or from an airport passenger terminal building. (Note that per FAA policy, the boundaries of this road are the first road or driveway in either direction from the terminal.) Note that an on-airport road (or the portion of a road) that does not go directly to or from a passenger terminal building is considered *access road* rather than *terminal development*. Walkways that lead directly to or from an airport passenger terminal building. Vehicles to move passengers between terminal facilities and between terminal facilities and aircraft per 49 USC § 47119(a)(1)(B).
Through-The-Fence Operation. A through-the-fence operation consists of an individual or company who owns property with aircraft storage facilities near an airport accessing the airfield of the airport with aircraft from off-airport property.
Turbojet Aircraft. For purposes of this Handbook, includes aircraft that have jet engines.
U
Unallowable Cost. The cost of an item or activity that is not allowed to be funded with AIP, either by FAA policy, published cost standards, or legal prohibition.
Uneconomic Remnant. A parcel of real property in which the owner is left with an interest after the partial acquisition of the owner's property, and which the sponsor has determined has little or no value or utility to the owner. This is a parcel in addition to the property needed. Uneconomic remnants may be incorporated into airport property as feasible, or disposed.
Usable Unit of Work. A completed project that will result in an increase in safety, usefulness, or usability at the airport. For the purposes of AIP grants, a usable unit of work can be obtained over one or more grants, provided the end result is a usable unit of work. This also requires a special condition in the grant requiring the sponsor to complete the work regardless of whether the associated future grants are issued. The automated AIP system contains the current available special conditions.
Used or Intended to be Used. Used means currently in use. Per FAA policy, *intended to be used* means that the use will be realized within the next three to five years.
Useful Life. Useful life is the period during which an asset or property is expected to be usable for the purpose it was acquired. It may or may not correspond with the item's actual physical life or economic life.

Table A-1 Definition of Terms Used in This Handbook

Definitions
W
Wide Area Augmentation System (WAAS). WAAS provides improved navigation accuracy, availability, integrity, and continuity for aircraft navigation during departure, en route, arrival, and approach operations including no precision approaches and approach procedures with vertical guidance. Without WAAS, aircraft using GPS navigation equipment under instrument flight rules (IFR) must be equipped with an approved and operational alternate means of navigation appropriate for the flight. WAAS corrects for GPS signal errors caused by ionospheric disturbances, timing, and satellite orbit errors, and it provides vital integrity information regarding the health of each GPS satellite.

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Appendix B. References and Web Links

B-1. References and Web Links.

Table B-1 contains a list of the references included in this Handbook. Web links are provided in this list (they are not given again in the Handbook) and were current on the Handbook publication date. The versions for specific documents are not given – the current version must be used. Also, where possible, website links do not link directly to documents because these types of links tend to break often. Instead, they link to source web pages to ensure links stay current (and for some documents this is required by FAA Web policy).

Table B-1 References and Web Links

Web links to references in this Handbook include…
AIP Forms This website provides all available forms for AIP as well as other FAA Office of Airports functions. http://www.faa.gov/airports/resources/forms/
AIP Grant Assurances The grant assurances are the obligations associated with a grant that require the sponsors to maintain and operate their facilities safely and efficiently and in accordance with specified conditions. Many of the assurances are based on 49 USC §§ 47105, 47106 and 47107. http://www.faa.gov/airports/aip/grant_assurances/
AIP Grant Histories This website provides AIP grant histories for all airports included in the National Plan of Integrated Airport Systems (NPIAS). http://www.faa.gov/airports/aip/grant_histories/
AIP Grant Payments This website provides information on how to use the current DOT electronic payment system. http://www.faa.gov/airports/aip/grant_payments/
AIP Letter of Intent History This document contains the annual payments for all open and closed Letter of Intents (LOIs). http://www.faa.gov/airports/aip/loi/
AIP Program Guidance Letters (PGLs) Program guidance letters are interim guidance issued about AIP. A PGL is a change to the Handbook. http://www.faa.gov/airports/aip/guidance_letters

Table B-1 References and Web Links

Web links to references in this Handbook include…
AIP Program Information Memorandums (PIMs) Program Information Memorandums are interim guidance that does not change the content of the AIP Handbook, but provides additional clarifying information. http://www.faa.gov/airports/aip/guidance_letters
Airport Business Practices and Their Impact on Airline Competition This document discusses the reduction and/or elimination of airline entry barriers to an airport. http://www.faa.gov/airports/aip/
Airport Improvement Program (AIP) Grant Oversight Risk Model Policy This policy outlines the FAA Office of Airports risk-based approach to grant oversight. http://www.faa.gov/airports/aip/
Airport Improvement Program Handbook This order provides guidance to FAA staff about the administration of the Airport Improvement Program. http://www.faa.gov/airports/aip/aip_handbook/
AJW-144 Weather Processors and Sensors – Non-Federal AWOS This FAA Technical Operations website describes the requirements for design, installation, commissioning and maintenance of a non-Federal AWOS. http://www.faa.gov/about/office_org/headquarters_offices/ato/service_units/techops/safety_ops_support/nonfedawos/
ASMB C-10 **Cost Principles and Procedures for Establishing Cost Allocation Plans and Indirect Cost Rates for Agreements with the Federal Government** The United States Department of Health and Human Services issued this guidance on cost allocation plans and indirect cost rate agreements. http://www.nhtsa.gov/nhtsa/whatsup/tea21/grantman/html/00_manl_contents1_01.html
Bulletin 05-02, Update of Statistical Area Definitions and Guidance on Their Uses This Office of Management and Budget (OMB) publication defines the term *metropolitan area*. https://obamawhitehouse.archives.gov/omb/bulletins_fy05_b05-02
Buy American Product Content Percentage Worksheet Worksheet to calculate Buy American percentages for AIP funded projects. https://www.faa.gov/airports/aip/buy_american/

Table B-1 References and Web Links

Web links to references in this Handbook include…
Buy American Product Final Assembly Questionnaire Questionnaire to provide information to determine if the Buy American product final assembly requirements have been met. https://www.faa.gov/airports/aip/buy_american/
Code of Federal Regulations (CFR) https://www.gpo.gov/fdsys/browse/collectionCfr.action?collectionCode=CFR
Contract Provision Guidelines for Obligated Sponsors and Airport Improvement Program Projects This document provides a consolidated listing of required clauses and provision for AIP projects and obligated sponsors. http://www.faa.gov/airports/aip/procurement/federal_contract_provisions/
Crosswalk between 2 CFR part 200 and Previous OMB Circulars This site contains crosswalks between OMB Circulars A-102 (administrative); OMB Circulars A-87 (cost principles); and OMB Circulars A-89 and A-133 (audit requirements) and 2 CFR part 200. https://cfo.gov/cofar/cofar-resources/
Current FAA Advisory Circulars Required for Use in AIP Funded and PFC Approved Projects This is a checklist of advisory circulars that must be used on AIP and PFC funded projects. Other advisory circulars that are specific to the project may also be needed. The list is kept up-to-date by AAS-100. http://www.faa.gov/airports/aip/
Department of Defense Contract Pricing Reference Guides This document provides guidance to sponsor's preparing cost or price analyses. https://www.dau.mil/tools/p/cprg
Department of Transportation (DOT) Office of Inspector General (OIG) Hotline This website allows OIG to receive allegations of fraud, waste, abuse, or mismanagement of AIP funds. https://www.oig.dot.gov/hotline
Department of Transportation (DOT) Order 4200.5 **Suspension and Debarment, and Ineligibility Procedures** This order outlines the requirements for suspending and debarring persons and companies from federally funded projects (including those funded by AIP). http://www.transportation.gov/assistant-secretary-administration/procurement/suspension-and-debarment

Table B-1 References and Web Links

Web links to references in this Handbook include…
Establishment and Discontinuance Criteria for Automated Weather Observing Systems FAA Report APO-83-6 This report provides benefit-cost analysis requirements for automated weather observing systems (AWOS) for publication in the current version of FAA Order 7031.2, Airway Planning Standard Number One. http://trid.trb.org/view.aspx?id=933426
FAA Advisory Circulars (ACs) – Series 150 for Airport Projects http://www.faa.gov/airports/resources/advisory_circulars/
FAA Airport Benefit-Cost Analysis Guidance This document provides guidance to sponsors on benefit-cost analysis (BCA) for capacity projects. http://www.faa.gov/airports/aip/bc_analysis/
FAA CertAlerts http://www.faa.gov/airports/airport_safety/certalerts/
FAA Office of Airports Website This website contains many references, forms, guidance, and other information needed for AIP projects. http://www.faa.gov/airports/
FAA Office of Airports Standard Operating Procedures This website contains standard operating procedures for various FAA Office of Airports functions. http://www.faa.gov/airports/resources/sops/
FAA Orders http://www.faa.gov/regulations_policies/orders_notices/
Federal Accounting Standard Advisory Board (FASAB) Standards Statement of Accounting Standards No. 27, Identifying and Reporting Earmarked Funds, explains how earmarked funds are financed by specifically identified revenues. This document details the reporting requirements for these projects. http://www.fasab.gov/accounting-standards/2004-pronouncements-as-amended/
Federal Contract Tower Minimum Equipment List The list is included in FAA Order JO 7210.54, FAA Contract Tower (FCT) Operation and Administration and lists the eligible equipment at contract towers. http://www.faa.gov/regulations_policies/orders_notices/

Table B-1 References and Web Links

Web links to references in this Handbook include…
Federal Emergency Management Agency (FEMA) Flood Maps This website provides flood maps for Federal agencies to determine if a sponsor requires flood insurance for certain projects prior to receiving a grant. http://www.fema.gov/national-flood-insurance-program-flood-hazard-mapping
Federal Funding Accountability and Transparency Act of 2006 (FFATA) This act (Public Law 109-282) outlines the subgrant reporting requirements for block grant states. https://www.fsrs.gov
Federal Register Notices http://www.archives.gov/federal-register/
FHWA Construction Program Guide (Suspension/Debarment) This website provides links to references on suspension and debarment. http://www.fhwa.dot.gov/construction/cqit/suspensi.cfm
Final Report – Life Cycle Cost Analysis for Airfield Pavements (AAPTP 06-06) This Federal Highway Administration document provides a good primer for sponsors who would like to learn about life-cycle cost analysis. http://www.eng.auburn.edu/research/centers/ncat/info-pubs/aaptp/index.html
Financial Assistance Guidance Manual This guidance manual replaces DOT Order 4600.17A, Financial Assistance Management Requirements, and outlines the requirements for administering AIP and prescribes the procedures for implementing laws, regulations, Executive orders, and Office of Management and Budget (OMB) circulars, providing guidance for the administration of DOT financial assistance programs. https://www.transportation.gov/mission/administrations/administration/senior-procurement-executive/financial-assistance-policy
Government Accountability Office's (GAO) Principles of Federal Appropriations Law (Red Book) This publication is a multi-volume publication that discusses Federal fiscal law requirements and legal decisions. http://www.gao.gov/legal/redbook/redbook.html
Guidance on Airport Recycling, Reuse, and Waste Reduction Plans Technical guidance on preparing airport recycling plans and enhancing airport recycling programs. http://www.faa.gov/airports/environmental/airport_recycling/

Table B-1 References and Web Links

Web links to references in this Handbook include…
GSAXcess This is the website for the Federal Excess Personal Property Utilization Program. Sponsors can go to this site to find free used equipment for their airport. http://gsaxcess.gov
Highlights of Reported Actions to Reduce Barriers to Entry and Enhance Competitive Access This document summarizes reported actions taken by covered airports to reduce barriers to entry and enhance competitive access. Not currently available on the FAA Office of Airports website (contact APP-510 for a copy).
Life-Cycle Cost Analysis Primer This Federal Highway Administration document provides a good primer for sponsors who would like to learn about life-cycle cost analysis. http://www.fhwa.dot.gov/infrastructure/asstmgmt/lcca.cfm
National Fire Protection Association (NFPA) 1971 Standard on Protective Ensembles for Structural Fire Fighting and Proximity Fire Fighting This document provides minimum levels of protection during structural and proximity firefighting operations. http://www.nfpa.org/codes-and-standards/all-codes-and-standards/list-of-codes-and-standards/detail?code=1971
Noise Land Management and Requirements for Disposal of Noise Land or Development Land Funded with AIP This document provides guidance on FAA and sponsor requirements regarding the management of noise and AIP funded land. http://www.faa.gov/airports/environmental/policy_guidance/
Office of Management and Budget (OMB) **OMB Circulars** https://www.whitehouse.gov/omb/information-for-agencies/circulars
Office of Management and Budget (OMB) **State Point of Contact Information for Intergovernmental Review** This website provides the contact information that the sponsor must use when a project is required to go through the intergovernmental review process. https://obamawhitehouse.archives.gov/omb/grants_spoc

Table B-1 References and Web Links

Web links to references in this Handbook include…
Pilot Program for Redevelopment of Airport Properties (Acquired Noise Land) Guidance for the FAA pilot program to fund activities related to the compatible redevelopment of airport properties purchased for airport noise compatibility with AIP and PFC funds. https://www.faa.gov/airports/aip/guidance_letters/historical_guidance_letters/ (See PGL 13-04)
Public Laws http://www.gpo.gov/fdsys/
Quick Guide to Cost and Price Analysis for HUD Grantees and Funding Recipients **United States Department of Housing and Urban Development** This document provides guidance to sponsor's preparing cost or price analyses. http://portal.hud.gov/hudportal/HUD?src=/program_offices/cpo/grantees/cstprice
Suggestions for the Detection and Prevention of Construction Contract Bid Rigging This paper discusses bid improprieties and how to detect them. http://www.fhwa.dot.gov/programadmin/contracts/dotjbid.cfm
System for Award Management (SAM) This website contains a list of suspended and debarred persons and companies that have been excluded from doing business with the Federal government. https://sam.gov
Uniform Appraisal Standards for Federal Land Acquisition This document is for use by appraisers to promote uniformity in appraising federally funded land acquisition. http://www.justice.gov/enrd/appraisal-unit
United States Code (USC) http://fdsys.gov
US Army Corps of Engineers Engineer Pamphlet (EP) 1110-1-8 **Construction Equipment Ownership and Operating Expense Schedule** This document provides the method for a sponsor to determine the hourly rate they can claim for construction equipment used in force account work. http://www.publications.usace.army.mil/USACEPublications/EngineerPamphlets

Table B-1 References and Web Links

Web links to references in this Handbook include…
Voluntary Airport Low Emission Program (VALE) Technical Report This report presents information on the application process, project eligibility, vehicle low emission standards, and how to calculate project emission reductions, cost-effectiveness, and credits. http://www.faa.gov/airports/environmental/vale
Zero Emissions Vehicle and Infrastructure Pilot Program Technical Guidance This guidance provides details on eligibility for zero emissions vehicles and associated infrastructure, allowable vehicle use, eligible airports, grant limitations, and the application process. http://www.faa.gov/airports/environmental/zero_emissions_vehicles/

Appendix C. Prohibited Projects and Unallowable Costs

C-1. Examples of General Prohibited Projects/Costs (for All Types of Projects).

The list in Table C-1 is not comprehensive. Instead, it contains examples of projects or costs specifically prohibited in the Act or whose eligibility is frequently questioned. Unless a specific reference to the Act is cited, these prohibitions are FAA policy.

Table C-1 Examples of General Prohibited Projects/Costs for All Project Types

Examples include, but are not limited to…	
(1)	**ACIP Update as Project Formulation.** Updates to an airport's capital improvement plan as part of the project formulation costs. Updates to an airport's capital improvement plan are only eligible if warranted as part of a master plan study or update grant.
(2)	**Administrative Costs as a Percent of the Grant Amount.** Administrative costs must be based on work that is necessary for carrying out the project.
(3)	**Administrative Costs for AIP Program Management.** Because AIP funds can only be used for costs to carry out a specific AIP project, program administrative costs incurred by the sponsor for managing the grant program are not allowable.
(4)	**Airfield Operations and Maintenance Costs**.
(5)	**Approach Procedures – Design and Establishment Costs.** In general, AIP cannot be used to design new approach procedures or to fund the costs associated with establishing a new procedure except in very limited circumstances that are allowed under the Act.
(6)	**Budget Augmentation.** Combining funds between different Federal programs if not specifically allowed as discussed in Paragraph 4-13.
(7)	**Catering.** Including at public meetings or other events for an AIP project.
(8)	**Computer Software (Including Common Use Gate Software).** Software that does not meet the requirements in Paragraph 3-66.
(9)	**Conferences, Seminars, and Courses.** Tuition, travel, or subsistence for a sponsor's personnel to attend conferences, seminars, or courses.
(10)	**Construction on Land Leased from a Private Entity.** Projects must be on airport property with good title per Paragraph 3-16. As discussed in Table 2-9, leasing from a private entity does not meet the requirements for good title.
(11)	**Contingencies or Allowances**.

Table C-1 Examples of General Prohibited Projects/Costs for All Project Types

Examples include, but are not limited to…
(12) Correcting or Doing Something More than Once – Construction/Equipment/Land. Cost to correct or do something more than once. This is based on the general AIP premise that AIP is intended for something to be done correctly one time. Therefore, costs not required to complete the project are not allowable. This includes restocking charges if a contractor orders too much or an incorrect material and wants to return the materials to the supplier. While the supplier may charge the contractor to restock the materials, the costs of restocking are not required to complete the projects. It also includes costs for replacing defective materials, or items that are warranty issues, and all costs associated with the removal and replacement of pavement or materials that do not meet the FAA specifications.
(13) Correcting or Doing Something More than Once – Design/Planning. Cost for design more than once except as allowed in Paragraph 3-22 for advisory circular changes. Following the premise above, AIP grant funds cannot be used to redesign. The exception is for design omissions that were not negligent and the additional work was necessary and would have been done anyway under a correct set of plans. For example, if a sponsor is given a design-only grant and is delayed in starting the construction, the plans may need to be reviewed and some parts of it redesigned. The costs to redesign or to bring the plans up to date are not allowable costs since AIP paid the first time to correctly design the project.
(14) Costs to Recover Improper Payments. By FAA policy, the costs incurred by a sponsor to recover improper payments are not an allowable cost of an AIP grant project. Although 2 CFR § 200.428 considers costs to recover an improper payment an allowable cost, these costs are not allowable under AIP. This is because AIP grants are project specific and limited by 49 USC § 47110 to only those costs that are reasonable and necessary to carry out the project. The costs to recover improper payments do not meet that statutory requirement.
(15) Decorative Landscaping. This is per 49 USC § 47110(f). Planting can only be funded to the extent that it is a cost associated with an AIP project and required for erosion control, state and/or local construction practices or for noise mitigation. As with any ineligible work, where the sponsor desires to include landscaping for aesthetic effect with a project, the costs must be broken-out from the grant funded part of the project.
(16) DBE Plan Updates as a Stand-Alone Plan. DBE updates are required when the anticipated amount of Federal funding is $250,000 or greater in a fiscal year, and the cost of the plan update may be included as an allowable cost of the project that is triggering the need for the plan update.

Table C-1 Examples of General Prohibited Projects/Costs for All Project Types

Examples include, but are not limited to…
(17) Equipment – Turned Over at End of Project. Acquisition of non-expendable equipment as part of an AIP development project. Some examples include: **(a)** Hand held radios **(b)** Vehicle beacons **(c)** Pavement marking machines **(d)** Joint sealing machines **(e)** Ohm meters **(f)** Sweeper brooms **(g)** Commercial barricades **(h)** Construction vehicles/trucks **(i)** Inspection vehicles/trucks **(j)** Construction office trailer/building **(k)** Hand held cameras **(l)** Lighted X's While the cost associated with the temporary use of non-expendable equipment is eligible under AIP, the acquisition of such equipment under a development grant is not. The practice of requiring a project contractor to transfer ownership of temporary non-expendable equipment to the owner at the end of the project is an impermissible procurement action. For example, it is reasonable to require the contractor to furnish hand-held radios during the duration of the project. It is not allowable under AIP to require the contractor to transfer ownership of these radios to the airport owner at the conclusion of the project. AIP may not participate in costs associated with acquiring equipment for day-to-day airport operations. This includes direct and indirect acquisitions.
(18) Extended Warrantees. Not allowable because not required under 2 CFR § 200.325.
(19) Flight Checks – Certain Cost. Flight check costs for establishing procedures or anything other than the initial flight check for an AIP funded NAVAID or weather aid.
(20) Fundraising. Any costs incurred in connection with raising funds by the sponsor, including interest and premium charges and administrative expenses involved in conducting bond elections and in selling bonds. Such costs are ineligible unless specifically allowed by statute, regulation, or a similar provision.
(21) Indirect Cost Applied to Costs Other Than Direct Salary and Wages. The rate approved under the cost allocation plan (also referred to as the indirect cost allocation plan rate, or ICAP rate) for a sponsor is applied only to the costs associated with sponsor's employee's hourly rate. The rate is not a multiplier on anything but the employee's hourly rate. This means that the ICAP cannot be applied to contract costs, construction costs, consultant costs, or any other type of cost that is not a sponsor's employees' salaries and wages for hours worked on an AIP project.

Table C-1 Examples of General Prohibited Projects/Costs for All Project Types

Examples include, but are not limited to…
(22) Interest Charges. Interest charges, except payment of interest directed by a court in a condemnation proceeding, which then becomes part of the condemnation award and allowable. However, where the amount deposited in court as fair market value was adequate and could have been withdrawn by the property owner without prejudice to his/her rights in the condemnation proceeding, such interest payment is not allowable.
(23) Legal Fees Defending a Specification or Federal Contract Requirement. These costs are not required to complete the project.
(24) Liability Insurance – Excessive for Contractor/Consultant. Liability insurance well beyond that normally carried by the contractor or consultant for his own protection. This includes liability for damages beyond the scope of the consultant or contractor contract (such as making a consultant liable for acts of third party contractors not under the control of the consultant).
(25) Liability Insurance – For the Airport Sponsor. The requirement that the sponsor be indemnified by the contractor against potential damages is not an FAA or AIP requirement, nor is it an essential element in completing the project. Rather, this third party coverage would simply protect the airport and its insurer against the presumed added risk of airport operations during periods of construction and add the cost of that protection to the construction costs.
(26) Lobbying. Cost of activities associated with the lobbying for a project or influencing Federal employees. The regulations on lobbying or influencing Federal employees do not restrict technical negotiations involving AIP projects.
(27) Maintenance Bonds. Not allowable because not required under 2 CFR § 200.325.
(28) On the Job Training Programs. Agencies such as the Federal Highway Administration have specific statutory authorization to establish apprenticeship and training programs targeted to move women, minorities, and disadvantaged individuals into journey-level positions. The FAA does not have similar statutory authorization for AIP and therefore cannot participate in such programs.
(29) Procurements with Improper Bid Alternates. Using the procurement process as a cost estimating tool is not allowed. The sponsor is not allowed to bid alternates that it has no intention of putting under contract. An example would be where a sponsor is permitted by its 14 CFR part 139 index to acquire a 1,500 gallon ARFF vehicle, but wants a 3,000 gallon vehicle and intends to pay the additional cost using local funds. This is to avoid having contractors and suppliers incur significant costs to bid hypothetical projects.
(30) Projects That Have Not Been Determined to be Eligible. Any project that has not been determined to be eligible by the FAA. If this Handbook does not list a project as eligible, the ADO must receive an eligibility determination from APP-500.
(31) Repair, Replacement or Upgrading of AIP funded Computer Hardware and Software used in AIP Projects. Repair, replacement, or upgrading computer hardware or software before the useful life of the system has been met. Computer hardware and software are considered supplies and the ADO cannot fund interim replacement of components prior to the end of the useful life of the AIP project (such as electrical vaults and access control systems).

Table C-1 Examples of General Prohibited Projects/Costs for All Project Types

Examples include, but are not limited to…
(32) Replacement or Repair of Damaged Facilities or Equipment. **(a) Non-Emergency Repair or Replacement of Eligible Infrastructure.** Replacement or repair of facilities or equipment that has been damaged are not eligible unless the sponsor can prove that there is no other avenue of funding, such as insurance, legal recourse, an airport emergency reserved fund, or funding through another Federal agency responsible for such disasters. **(b) Emergency Repair or Replacement of Eligible Infrastructure.** From a disaster recovery aspect, AIP grant funding efforts are focused on the capital improvements that have been damaged**.** AIP funding is limited to eligible projects as long as there is no other avenue of funding, such as insurance, legal recourse, an airport emergency reserved fund, or funding through another Federal agency responsible for such disasters. In addition, the normal grant rules apply. **(c) Emergency Repair or Replacement of Ineligible Infrastructure.** AIP funding of emergency disaster repairs that are not normally eligible for AIP are not allowed without express congressional authorization.
(33) Replacement, Repair, or Renovation of Ineligible Facilities/Equipment. Unless allowed under Paragraph 3-74, if AIP cannot be used to construct or acquire something, then AIP cannot be used to repair, replace, or renovate it.
(34) Sculptures or Works of Art. Per 49 USC § 47110(f).
(35) Training. Only acquisition of certain training systems and equipment is eligible, not the actual training.
(36) Unclassified Airport Projects – Unjustified. Nonprimary airports that are not classified as National, Regional, Local, or Basic airports in the latest edition of the FAA Asset report have very low levels of activity. As a result, only projects that meet the requirements in Paragraph 3-10 may be funded by the ADO**.**

C-2. Examples of Construction Prohibited Projects/Costs.

The list in Table C-2 is not comprehensive. Instead, it contains projects or costs specifically prohibited in the Act or whose eligibility is frequently questioned. Unless a specific reference to the Act is cited, these prohibitions are FAA policy.

Table C-2 Examples of Prohibited Projects/Costs for Construction

Examples include, but are not limited to…
(1) All of the Examples in Table C-1.
(2) Access Road – Ineligible Segments. A portion of an access road that meets any of the following criteria: **(a)** Does not exclusively serve airport traffic to/from an aeronautical use on the airport (aeronautical use includes terminals, cargo facilities, hangars, air national guard, etc.). **(b)** Is exclusively for the purpose of connecting parking facilities (or other non-aeronautical facilities such as rental car facilities and on-airport hotels) to an eligible portion of the access road. **(c)** Solely serves industrial or non-aeronautical areas or facilities. **(d)** Is necessary only to maintain FAA facilities installed under the F&E program. **(e)** Is not on airport property or an airport-owned easement. **(f)** Is not needed for the circulation of airport passengers or air cargo.
(3) Air Compressors. Air compressors beyond the single fixed system in an ARFF building that is intended to support the maintenance bay and self-contained breathing apparatus (SCBA). Portable air compressors are also ineligible.
(4) Aircraft Deicing Equipment and Fluid Storage Facilities. Per 49 USC 47102(3)(G), the acquisition of *aircraft* deicing fluids or constructing or reconstructing storage facilities for *aircraft* deicing equipment or fluids. Note that this is not the same as drainage collection, treatment, and discharge systems for treating aircraft deicing fluids, which are considered AIP eligible.
(5) Airline Operations and Maintenance Facilities. This includes catering facilities and airline related waste disposal facilities such as triturators and food waste incinerators.

Table C-2 Examples of Prohibited Projects/Costs for Construction

Examples include, but are not limited to…
(6) Aircraft Rescue and Firefighting (ARFF) Buildings – Certain Areas/Equipment. **(a) Buildings Bays for Non-Airport ARFF Vehicles or Non-ARFF Vehicles.** ARFF building bays for fire trucks or vehicles that are stationed on the airport, but primarily provide services outside the airport boundaries, or for any vehicle that is not required by regulation except for a single structural fire truck that is used to provide backup support to ARFF vehicles and protection to airport buildings. **(b) Dedicated Office Space.** Office space beyond an open area to accommodate a desk for the shift commander and one administrative staff (when applicable). Dedicated space for other administrative purposes that are not allowable include office space for the Fire Chief, Deputy Chief, and other officers **(c) Conference Rooms**. **(d) Private Dormitories and Lavatories**. **(e) Exercise Facilities.** **(f) Extra Generators or Air Compressors.** Only one fixed emergency generator and one fixed air compressor of sufficient size to operate the ARFF bay system and to maintain the readiness of self-contained breathing apparatus (SCBA) are allowable. **(g) Non-fixed Furniture or Equipment.** Non-fixed items such as tables, chairs, couches, portable generators, and portable air compressors are not allowable. **(h) Station Store.** **(i) Public Restrooms and/or Bathrooms.** Restrooms and bathrooms beyond what is need for the ARFF staff. **(j) Separate TV Room.** Only a day room of proper size is eligible. **(k) Separate Telephone Room.** **(l) Washers/Dryers.** **(m) Separate Computer Training Room.** Only one training room for computer and non-computer training is allowable.
(7) Aircraft Self-Docking Systems. System to automatically guide pilots to the gate and allow the pilots to self–park aircraft without ramp personnel (advantageous during presence of lightning) through the use of laser range finders and light-emitting diode (LED) displays. This equipment is not required by rule or regulation and is typically airline owned.
(8) Bathrooms/Restrooms. Bathrooms differ from restrooms in that they include a shower or a tub, which is not required by the Americans with Disabilities Act (ADA). **(a) Bathrooms.** Not allowed except in ARFF buildings if required by 14 CFR part 139 staffing requirements. **(b) Restrooms.** Not allowed in any building other than ARFF buildings and public areas of a terminal building.

Table C-2 Examples of Prohibited Projects/Costs for Construction

Examples include, but are not limited to…
(9) Bid Alternates that are Not Possible. Sponsors must not use the procurement process, such as including bid alternates, as a means of determining project costs. Bidding a 1,500 gallon ARFF vehicle and a 3,000 gallon vehicle simply to determine the difference in costs of the two vehicles when the sponsor has no intent of actually acquiring the smaller vehicle.
(10) Buildings – Not in Act. Any building that is not an eligible facility at that airport for storing *airfield* deicing materials, terminal, ARFF building, snow removal equipment building, hangar, or contract tower (unless specifically allowed under a special AIP funding program in Chapter 6).
(11) Cell Phone Waiting Lots – Unnecessary Costs. Areas for unattended car parking and amenities such as flight information display boards are not considered necessary.
(12) Command and Control Centers Area/Cost Beyond Maximum. Any area or cost beyond what is allowed in Table O-3.
(13) Early Completion Bonuses.
(14) Explosive Detection System (EDS) or Associated Terminal Modification. Beginning in FY 2004, and in every year since then, the FAA appropriations bill has prohibited using AIP grant funds on EDS systems or any building modifications that are necessary to support or install an EDS system. Because PFC eligibility hinges on AIP eligibility, leaving the project eligible but prohibiting funding is a work-around that allows these projects to be funded with PFCs.
(15) Environmental Remediation. Environmental remediation and removal of fuel farms, underground fuel tanks, hazardous waste, or contaminated soil. This is because sponsors are required by the grant assurances to maintain facilities to environmental standards. In addition, the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), commonly known as Superfund, provides that the responsible party causing the contamination can be accountable for recovery of clean-up costs, regardless of the level of negligence.
(16) Fueling Facilities – Non-Aircraft. Fueling facilities are not eligible for non-aircraft vehicles, regardless of the location on the airport or the non-aircraft vehicles that will use the facility. This includes fueling facilities for AIP eligible vehicles such as aircraft rescue and firefighting trucks and snow removal equipment. Fuel *storage* for non-aircraft vehicles within a fuel farm is also ineligible.
(17) Fueling Facilities – Rehabilitating or Replacing. Unless otherwise eligible and approved under the Voluntary Airport Low Emission Program (VALE) or the Zero Emission Vehicle and Infrastructure Pilot Program (ZEV), the following is not eligible: **(a)** Constructing a new fuel farm if the airport already has a fuel farm, even if the existing fuel farm has reached the end of its useful life (AIP can only fund initial construction, then the facility is expected to be self-supporting). **(b)** Projects to address environmental deficiencies. **(c)** Replacing individual components like fuel tanks, even if the purpose is to provide more capacity. Only adding supplemental tanks are allowed if justified.

Table C-2 Examples of Prohibited Projects/Costs for Construction

Examples include, but are not limited to…
(18) Furniture. All furniture except fixed furniture for passenger seating (including fixed tables and counters) in holding areas of a terminal that is installed as an allowable cost of a terminal building project.
(19) Furniture – Replacement of Fixed. Replacement of fixed terminal furniture after the initial installation, unless the replacement is necessitated by an eligible terminal project.
(20) Hangar Acquisition (on Land Leased from the Airport). Acquisition of an existing hangar on land leased from the airport because there should have been a reverter clause for the hangar in the land lease agreement. APP-500, with support from and ACO-100, may approve exceptions with extraordinary justification on a case by case basis.
(21) Law Enforcement Facilities. Law enforcement facilities that are not airfield facilities to provide for a law enforcement presence required for air transportation security. The FAA has determined that the only facilities that are eligible are guard shacks at airfield access points. Co-located Command and Control Centers or Emergency Operations Centers also have limited eligibility.
(22) Light Emitting Diode (LED) Lighting. It is FAA policy that: **(a)** LED obstruction lights, LED approach lights (does not include touch down zone or centerline lights) and LED high intensity runway edge lights are not currently AIP eligible. This is because LED fixtures may not provide the infrared signature necessary for aircraft using Enhanced Flight Vision Systems or Night Vision Imagery technology. This FAA prohibition was reviewed and upheld in December 2014. **(b)** AIP funds cannot be used to replace AIP funded lighting fixtures with LED fixtures (either allowed or prohibited) if the existing AIP funded fixtures have not met the end of their useful life. **(c)** The installation of nonstandard electrical system components as part of an eligible LED lighting project is not allowed. **(d)** Costs for associated cable, conduit, etc., for prohibited LED lights is also restricted as discussed in Table 3-57.
(23) Maintenance/Service Facilities. Construction of maintenance/service facilities, except that allowed to store snow removal equipment, and to store the aircraft rescue and firefighting equipment that is required under 14 CFR part 139.
(24) Multimodal Terminals. Areas not directly related to air commerce. Only the areas directly related to air commerce are eligible.
(25) NAVAID Relocation. The relocation of NAVAIDs and other facilities except as allowed under Paragraph 3-74. Relocation strictly for the convenience of the owner (be it the sponsor, the FAA, or other type of owner) is not allowable.

Table C-2 Examples of Prohibited Projects/Costs for Construction

Examples include, but are not limited to…
(26) NAVAID Relocation – Refurbishing/Enhancing/Upgrading. AIP participation to move FAA-owned NAVAIDS that impede an AIP funded project must not include refurbishing, enhancing, or upgrading the impacted facility.
(27) Noise Barriers – Exclusive Use.
(28) Obstruction Removal – Beyond the Aircraft Category on the Approved ALP for that Runway.
(29) Obstruction Removal – Creation of Parks or Play Fields. Any redevelopment, such as the creation of parks or play fields, unless required as part of court ordered mitigation. This is because the redevelopment is not an essential element in completing the project.
(30) Obstruction Removal – More than Once. Topping trees, or any other obstruction removal, more than once using AIP funding. This includes re-topping a tree that cannot be removed because of environmental reasons (more than one topping is considered maintenance).
(31) Painting and Carpeting – Stand-Alone. Carpet replacement and painting as stand-alone projects. Carpet replacement or repainting impacted by an eligible project (and only within the boundaries of the eligible project) would be eligible as an incidental part of that project.
(32) Parking Lots/Garages for Passenger Vehicles – Except as Specifically Allowed. The following parking facilities are ineligible: **(a)** All parking lots at large, medium, and small hub airports. **(b)** All parking lots that are not for the movement of passengers per FAA policy (such as employee parking lots and restaurant parking lots) except as specifically allowed in this Handbook for limited passenger vehicle parking associated with an eligible building. **(c)** All parking garages. These are not considered parking lots (as specified in 49 USC 47119(a)(2)) and are not eligible at any size airport. **(d)** Revenue producing parking lots at nonhub airports (unless specifically allowed under a special AIP funding program in Chapter 6).
(33) Pavement – Adjacent to Terminal. The areas immediately adjacent to the terminal building that cannot be used by aircraft. This pavement may be eligible as terminal work provided it is associated with eligible terminal facilities.
(34) Pavement – Associated with a Snow Removal Equipment (SRE) or Aircraft Rescue and Firefighting (ARFF) Building. Pavement beyond what is necessary to move eligible SRE and ARFF vehicles in and out of AIP eligible SRE and ARFF buildings is ineligible. The exception is limited automobile parking for employee as allowed in this Handbook.

Table C-2 Examples of Prohibited Projects/Costs for Construction

Examples include, but are not limited to…
(35) Pavement – Exclusive Use. This includes exclusive use and near exclusive use aprons, taxiways, and taxilanes. Near exclusive use means that the airport has no procedures for the management and operation of the apron, hangar, or taxiway to ensure prompt access by each potential user. Appendix A contains a more complete definition and references on exclusive use.
(36) Pavement – In Front of an Ineligible Building. **(a)** For apron pavement in front of an ineligible building, the 50 feet of pavement immediately in front of the building is ineligible **(b)** A taxiway or taxilane that exclusively serves an ineligible building is ineligible.
(37) Pavement – Maintenance. Routine runway, taxiway, or apron maintenance except at nonhub primary airports and nonprimary airports under 49 USC § 47102(3)(H). Examples of eligible and ineligible maintenance are provided in Paragraph 3-6.
(38) Pavement – Unavailable for Aircraft Parking/Taxiing. Pavement for vehicle/aircraft maintenance, automobile parking, ground service equipment storage, areas to *square off* pavement if it is not needed or used for aircraft parking, or apron areas on the apron side of a hangar that cannot be used for public aircraft parking.
(39) Planning as Project Formulation. Including costs incurred preparing a metropolitan area or statewide airport planning as project formulation costs, even if the plan was not AIP funded. For example, photo slope or other obstruction analysis that was prepared in a non-AIP funded obstruction plan that is used as a basis for removing the obstructions at an airport.
(40) Price Escalation Increases.
(41) Restrooms. See Bathrooms/Restrooms in this table.
(42) Revenue Producing Aeronautical Support Facilities – Construction. Revenue producing aeronautical support facilities at other than nonprimary and Military Airport Program airports.
(43) Revenue Producing Aeronautical Support Facilities – Maintenance/Repair/Minor Rehabilitation. The maintenance, repair, and minor rehabilitation of revenue producing facilities is only allowed as part of the MAP program under 49 USC § 47118((f). The major rehabilitation of a hangar at a nonprimary airport or a Military Airport Program airport is allowed per 49 USC § 47102(24).
(44) Roads – To Federally Owned NAVAIDS.
(45) Roads – To Non-Aviation Areas/Facilities. This includes driveways and other access points that connect the access road to off airport property.
(46) Roads – To Parking. Roads, whatever length, exclusively for the purpose of connecting public parking facilities to an access road except where the public parking facility is constructed with AIP grant funds.

Table C-2 Examples of Prohibited Projects/Costs for Construction

Examples include, but are not limited to…
(47) Seismic Retrofit. For any building completed after July 14, 1993. This is because the DOT regulation requiring seismic measures was issued on this date.
(48) Service Road – For Airport Operations and Maintenance. Except as specifically allowed in Appendix P.
(49) Snow Removal Equipment (SRE) Buildings – Certain Areas. **(a)** Personnel Quarters. **(b)** Training Space. **(c)** Non-equipment Storage. **(d)** Restrooms and Bathrooms. **(e)** Maintenance Areas (beyond that eligible on an airport wide basis per Appendix N). **(f)** Offices. **(g)** Day Rooms or Lounges. **(h)** Kitchens or Break Rooms.
(50) Terminal – Certain Areas: **(a) Airline Frequent Flyer Lounge.** This is because these areas are not public use and are not necessary for the movement of passengers and baggage. **(b) Areas Behind Counters.** The areas behind airline, rental car, and concession counters are not eligible because they are not public use areas. **(c) Chamber of Commerce.** This is because these areas are not necessary for the movement of passengers and baggage. **(d) Conference Rooms.** Even if these areas are occasionally accessed by the public, they are not considered public-use. **(e) Customs and Border Patrol –Non-Public Areas.** Areas that are restricted from the public, including offices for screeners and supervisors, break rooms, training rooms, secure rooms where a passenger must be escorted (such as hold or search rooms), and similar uses are not eligible areas. **(f) Garbage Rooms.** Including equipment such as aircraft lavatory dump equipment, triturators, and incinerators. This is because these areas are not public use, are considered operations/maintenance, and are not necessary for the movement of passengers and baggage. **(g) Hallways (or Portions of Hallways) Not Serving Public Use Areas.** The portion of a hallway that is necessary to access a public use area (even if it also serves non-public use areas along the way), is eligible. The portion of the hallway that only serves non-public use area (including mechanical and electrical rooms) is not eligible. **(h) Janitor's Room.** This is because these areas are not public use, are considered operations/maintenance and are not necessary for the movement of passengers and baggage.

Table C-2 Examples of Prohibited Projects/Costs for Construction

Examples include, but are not limited to…
(i) Loading Docks. This is because these areas are not public use, are considered operations/maintenance, and are not necessary for the movement of passengers and baggage. **(j) Lost and Found Rooms.** Even if these areas are occasionally accessed by the public, they are not considered public-use. **(k) Offices.** All offices (airline, airport, tenant, security, etc.) are ineligible. Even if these areas are occasionally accessed by the public, they are not considered public-use and are not necessary for the movement of passengers and baggage. **(l) Passenger Screening Area Build Out and Equipment.** All build out costs and equipment (as with other terminal tenants) are ineligible. This includes exit doors or walls not needed for eligible purposes. Unlike access control and perimeter fencing, passenger screening is not 49 CFR part 1542 requirement. **(m) Police and Law Enforcement Facilities.** The only facilities that are eligible are guard shacks at airfield access points. In addition, co-located Command and Control Centers or Emergency Operations Centers also have limited eligibility. **(n) Staff Break Rooms.** **(o) Training Rooms.** Even if these areas are occasionally accessed by the public, they are not considered public-use. **(p) Transportation Security Administration (TSA) Security Checkpoint Consolidation – For TSA Staff Purposes Only.** In order for a checkpoint consolidation project to be eligible, there must be a current to five-year problem with the capacity of the existing lanes and the consolidation must be a reasonable cost solution to this problem. Security checkpoint consolidation for the sole purpose of reducing TSA staff costs is not eligible. **(q) TSA Checkpoint Rooms.** The room required by TSA staff to observe the checkpoint through a one way mirror is not eligible because it is not public use. **(r) TSA Storage Room for Confiscated Items.** Even if these areas are occasionally accessed by the public, they are not considered public-use. **(s) United Service Organizations (USO) Facilities.** This is because these areas are not public use and are not necessary for the movement of passengers and baggage.
(51) Terminal People Mover or Access Rail – Operations/Maintenance. Costs to operate or maintain the terminal people mover or access rail. This includes all associated maintenance facilities and equipment (including storage facilities, spare parts, spare equipment, tracks to a maintenance facility, maintenance equipment, and administrative offices).
(52) Terminal People Mover or Access Rail – To Certain Areas. Terminal people mover or access rail cost associated with access to commercial areas, maintenance areas, employee parking lots, or ticketing or fare collection areas.
(53) Through-the-Fence. Any development project to serve a through-the-fence operation per 49 USC § 47107(t)(2)(B)(ii). This is because through-the-fence operations are considered exclusive use and are not the responsibility of the sponsor.

Table C-2 Examples of Prohibited Projects/Costs for Construction

Examples include, but are not limited to…
(54) Utility Work – Stand-Alone Project. This is an allowable cost to an AIP eligible project, not a stand-alone project.

C-3. Examples of Equipment Prohibited Projects/Costs.

The list in Table C-3 is not comprehensive. Instead, it contains projects or costs specifically prohibited in the Act or whose eligibility is frequently questioned. Unless a specific reference to the Act is cited, these prohibitions are FAA policy.

Table C-3 Examples of Prohibited Projects/Costs for Equipment

Examples include, but are not limited to…
(1) All of the Examples in Table C-1.
(2) Air Compressors. Other than fixed air compressors built into an ARFF building to fill self-contained breathing apparatuses (SCBA).
(3) Aircraft Deicing Fluids. Per 49 USC § 47102(3)(B)(v).
(4) Aircraft Removal Equipment.
(5) Airport Surface Detection Systems. This must not be confused with equipment that TSA determines to be required to meet 49 CFR part 1542 for securing the airport perimeter, which may be eligible as security equipment.
(6) Airport Rescue and Firefighting (ARFF) Vehicles – Support Vehicles. ARFF support vehicles, such as fire marshal vehicles, unless AAS-1 has determined that this will significantly contribute to safety of individuals and property at the airport per 49 USC § 47102(3)(B)(ii).
(7) ARFF Vehicles – Back-Up or Reserve.
(8) ARFF Vehicles – Beyond Index. More than the minimum number, type, and size required by the ARFF index.
(9) ARFF Vehicles – No 14 CFR part 139 Certificate. ARFF vehicles for airports that do not hold 14 CFR part 139 certificates unless AAS-1 has determined that this will significantly contribute to safety of individuals and property at the airport per 49 USC § 47102(3)(B)(ii).
(10) ARFF Vehicles – Requiring a Delivery Period that is Less than 360 Days. Specifying a shorter period of time limits competition to those manufacturers that have ARFF vehicles that are already built.

Table C-3 Examples of Prohibited Projects/Costs for Equipment

Examples include, but are not limited to…
(11) AWOS– Bid as Upgradable. Sponsors must not bid an AIP funded AWOS-A, AWOS-A/V, AWOS-I and AWOS-II with a requirement for the system to be upgradable to an AWOS III or better. This is because not all AWOS manufacturers offer systems that can be upgraded, and therefore a bid requirement that establishes upgrade capabilities would limit competition. If the sponsor correctly bids the AWOS-A, AWOS-A/V, AWOS-I and AWOS-II (without an upgrade requirement), and the low bidder happens to be an AWOS that can be upgraded, the sponsor may use non-AIP funding to upgrade the system. However, it would then be the sponsor's responsibility to coordinate with their FAA Air Traffic Organization (ATO) Service Center Non-Federal Program Implementation Manager on all AWOS-III requirements.
(12) Certain Vehicles. The following vehicles are not eligible, even if the intent is to use the vehicle to pull an AIP eligible attachment. The exception is where AAS-1 has made a written determination that the vehicle or truck fills a unique safety or security need at that specific airport per Paragraph L-3. **(a)** Passenger cars (as defined by DOT). **(b)** Passenger trucks (as defined by DOT). **(c)** Snow removal vehicles below class 5. **(d)** Motor graders. **(e)** Skid steer loaders. **(f)** All-terrain vehicles (ATVs). **(g)** Lawn mowers. **(h)** Agricultural Tractors that do not have at least 100 horse power (HP) power take off (PTO) and 110 gross engine horse power (HP).
(13) Emergency Power Equipment. Equipment to provide emergency power to an airport for emergency housing, marshaling of equipment or supplies for catastrophe relief or other purposes. In addition to not being allowed, this could be an augmentation of another Federal agency's budgets since other agencies have the specific responsibility to provide those services.
(14) Expendable Items. Expendable items, such as extinguishing agents (except for one test charge and one refill at time of initial purchase of an ARFF vehicle), deicing materials (sand, chemicals, fluids, etc.), shotgun shells, chemicals, pyrotechnic devices (other than pyrotechnic pistols) and ammunition.
(15) Extended Warranty Costs or Requirements for Extended Servicing. The cost of extended warranties beyond that which is common in business because this is a maintenance and operational expense. This includes requirements in the bidding documents for ability to be onsite within a specified number of hours or for having service personnel within a certain geographic proximity of the project site which have been determined to be anti-competitive.
(16) Fencing – Beyond What is Reasonable. Fencing beyond what is minimally required for wildlife or people/vehicle deterrent purposes per the minimum requirements of the current version of Advisory Circular 150/5370-10, Standards for Specifying Construction of Airports.

Table C-3 Examples of Prohibited Projects/Costs for Equipment

Examples include, but are not limited to…
(17) Fencing – Non-Aeronautical. Fencing to benefit non-aeronautical use areas of the airport that is not primarily for protection of the airfield or terminal building.
(18) Flight Checks – More than One. The cost for the FAA Air Traffic Organization (ATO) to conduct more than one flight check (also called flight inspections) during the commissioning of a NAVAID or weather aid.
(19) Foreign Object Debris (FOD) Detection Systems – Optional Features. Optional features that exceed FAA design standards for system output requirements are not eligible for AIP and may not be used as a basis for selection of the system.
(20) Ground Communications Outlet (GCO). A GCO is a variant of a remote communications outlet (RCO), and like an RCO, is ineligible. Communications equipment of this type is normally funded through the FAA Air Traffic Organization (ATO).
(21) Ineligible Equipment – Any Associated Costs. AIP cannot be used to reimburse any costs associated with ineligible equipment. The single exception is for the installation of a sponsor's preferred airfield lighting equipment as discussed in Paragraph 3-36.
(22) Interactive Training Systems – Rental.
(23) Land and Hold Short Equipment. Trucks, follow-me signs, and other associated Land and Hold Short Operations (LAHSO) equipment.
(24) Maintenance Equipment/Tools. The acquisition of equipment or tools that are used to maintain, repair, reconstruct, or rehabilitate an item or facility, including equipment or tools used for pavement maintenance at nonhub primary or nonprimary airports. (If pavement maintenance is done by the sponsor's own forces using force account methods, a portion of the cost of the use of the equipment may be allowable.)
(25) Mobile Command Vehicles. The FAA has determined that mobile command vehicles cannot be considered as eligible firefighting and rescue equipment. This is because mobile command vehicles do not deliver firefighting personnel, equipment and fire suppression agents to the site of an accident, nor are they used in physically extinguishing fire or physically assisting in rescue efforts.
(26) Mobile Gate Power for Aircraft. Mobile air conditioning, heating or electric power facilities or equipment for the benefit of aircraft. This includes mobile preconditioned air units (PCA) and auxiliary power units (APU). This equipment is not considered terminal-based and are not eligible (unless otherwise eligible and approved under VALE). This is because the eligibility conferred in 49 USC 47102(O) limits this to only terminal-based systems. Therefore, systems that are mobile, non-terminal based, are not eligible.
(27) NAVAIDS at Airports without an FAA Air Traffic Organization (ATO) designated Instrument Runway. Only airport rotating beacons, runway end identification lights, and visual glide-slope indicator systems are eligible at airports without a designated instrument runway.
(28) Paint Machines. Paint machines for any purpose.

Table C-3 Examples of Prohibited Projects/Costs for Equipment

Examples include, but are not limited to…
(29) Pest Control Equipment for Rodent Extermination. This is considered a maintenance tool.
(30) Police Vehicles – More Than Allowed. Police vehicles are not eligible at airports without a 14 CFR part 139 certificate. Airports with a 14 CFR part 139 certificate are allowed a maximum of *one* police vehicle.
(31) Portable Emergency Generators. Portable emergency generators or light plants that function essentially as portable emergency generators.
(32) Radios and Communication Equipment – Stand-Alone and Portable (or Hand Held) Equipment. Radios and communication equipment are allowable costs only if they are part of the acquisition of an eligible ARFF vehicle, police vehicle, or a piece of snow removal equipment.
(33) Remote Communications Outlet (RCO). Communications equipment of this type is normally funded through the FAA Air Traffic Organization (ATO).
(34) Runway Surface Condition Sensors – Certain Features/Services. Service agreements, spare parts, and on-site service by the sensor system manufacturer required by the SAE document included in the current version of Advisory Circular 150/5200-30, Airport Field Condition Assessments and Winter Operations Safety. In addition, wind sensors, air sensor, relative humidity sensor, precipitation sensor, present weather/visibility sensor, sub-surfaces sensors; requirements for field processing units that exceed the minimum needed to support the eligible system, and central processing systems to receive, accept and display weather forecasts. These features and services are not allowable costs for runway surface condition sensors.
(35) Safety Equipment – Not Specifically Required by 14 CFR part 139. Except as allowed under Paragraph L-3.
(36) Security and Access Control Equipment – Landside. Security and access control equipment (such as closed circuit cameras) for protection of the unsecured landside areas of the airport (such as parking garages, rental car facilities, and terminal areas prior to security screening checkpoints).

Table C-3 Examples of Prohibited Projects/Costs for Equipment

Examples include, but are not limited to…
(37) Security Equipment. Projects exceeding the minimum requirements of 49 CFR part 1542 or are necessary to support local law enforcement. Examples include: **(a)** Video cameras that are not in the secured terminal area or airfield operations area. **(b)** Handheld cameras. **(c)** Badging supplies. **(d)** Tow trucks to tow vehicles. **(e)** Canines (dogs) and kennels (live animals). With the transfer of responsibility to DHS, airports are no longer responsible for canines for airport security. **(f)** Police radios (other than in an eligible police vehicle at time of acquisition). **(g)** Firearms for law enforcement or security purposes. **(h)** Law enforcement facilities except guard shacks at airfield access points.
(38) Sign Panel Replacement. See Paragraph J-3 for further discussion.
(39) Snow Removal Equipment (SRE) – Oversized or Increased Functionality. The size and/or functionality of snow equipment cannot be based on clearing snow from areas that are not priority 1 areas, such as parking lots, landside pavement, or between hangars.
(40) Snow Removal Equipment (SRE) - Specialized for Snow and Ice Removal on EMAS. There currently is no FAA requirement for the EMAS to be cleared of snow or ice.
(41) Squitters – Maintenance Contracts. This is an operational cost that is the responsibility of the sponsor.
(42) Tow Vehicles for Eligible Equipment.
(43) Towed FOD Sweepers. These are not considered eligible power sweepers.
(44) Visual Approach Slope Indicators (VASI). These have been replaced by the installation of Precision Approach Path Indicators (PAPI).
(45) Wildlife Reduction Equipment and Supplies. Shotgun shells, chemicals, pyrotechnic devices (other than pistols), and airport operations vehicles.

C-4. Examples of Land Prohibited Projects/Costs.

The list in Table C-4 is not comprehensive. Instead, it contains projects or costs specifically prohibited in the Act or whose eligibility is frequently questioned. Unless a specific reference to the Act is cited, these prohibitions are FAA policy.

Table C-4 Examples of Prohibited Projects/Costs for Land

Examples include, but are not limited to…
(1) All of the Examples in Table C-1.
(2) Compensation for Frustration of Development Plans.
(3) Compensation for Goodwill.
(4) Compensation for Loss of Business.
(5) Costs Exceeding Requirements. Any costs that exceed what is required by 49 CFR part 24 or do not conform to the Uniform Appraisal Standards for Federal Land Acquisitions.
(6) Costs to Lease Privately Owned Land. A lease of privately owned land is normally not considered adequate title and acquisition of the needed interest in the land is required.
(7) Land for Other than Airport Purposes. See Appendix A for definition of airport purposes.
(8) Real Estate Commissions.
(9) Stand-Alone Grants for Appraisals.

C-5. Examples of Noise Mitigation Prohibited Projects/Costs.

The list in Table C-5 is not comprehensive. Instead, it contains projects or costs specifically prohibited in the Act or whose eligibility is frequently questioned. Unless a specific reference to the Act is cited, these prohibitions are FAA policy.

Table C-5 Examples of Prohibited Projects/Costs for Noise Mitigation

Examples include, but are not limited to…
(1) All of the Examples in Table C-1.
(2) Block Rounding for Anything Other than a Residence. This includes buildings such as schools and places of worship.
(3) Block Rounding with Lower Local Standards. For example, if a local standard has been adopted to include residences that lie within the DNL 60 dB noise contour, residences that lie outside the DNL 60 dB are not eligible for block rounding. This is because by accepting a lower local standard, the FAA has already accepted exterior noise that is below the land use compatibility with yearly day-night average sound levels that FAA has accepted in 14 CFR part 150.

Table C-5 Examples of Prohibited Projects/Costs for Noise Mitigation

Examples include, but are not limited to…
(4) Building Code Corrections. If it is determined in the course of designing a sound insulation project that a building needs improvements in order to conform to local building codes, only the costs of the sound insulation are allowable. This includes making changes to meet current ventilation requirements where the existing central ventilation or air conditioning units do not meet current building code ventilation requirements.
(5) Cannot Be Implemented by an Eligible Sponsor. A 14 CFR part 150 approved NCP measure for a project that cannot be implemented by an eligible sponsor.
(6) Comfort or Attractiveness Improvements.
(7) Demonstration Programs. This may include installation of unproven methods of reducing sounds such as installing white noise generators in classrooms. This includes any 14 CFR part 150 approved NCP measure for a demonstration program intended to test the effectiveness of new noise mitigation technology.
(8) Follow-on Replacement. Follow-on replacement of windows, doors, equipment, or any items installed for noise reduction that appear to have met their useful life. Installation of noise reduction equipment is limited to the initial installation only.
(9) Inadequate Maintenance Corrections. Improvements to address inadequate maintenance.
(10) Inside DNL 75 dB or greater. Noise insulation projects for residences, schools, hospitals, places of worship, auditoriums, and concert halls within a DNL 75 dB or greater noise contour since these uses are never compatible in these noise contours, per Table 1 of Appendix A in 14 CFR part 150 —Land Use Compatibility With Yearly Day-Night Average Sound Levels. If a sponsor requests sound insulation in the DNL 75 dB contour, the ADO may consider consulting with APP-400 for guidance.
(11) Interior Noise Less than 45 dB. Noise mitigation inside the DNL 65 dB contour where the interior noise level is less than 45 dB unless the ADO has concurred that the limited costs are due to neighborhood equity.
(12) Mitigation of a Noise Sensitive Use in a Commercially Zoned Structure.
(13) Mitigation Outside DNL 65 dB. Noise mitigation outside the DNL 65 dB contour unless the interior noise level is greater than 45 dB and the ADO has concurred that the limited costs are due to block rounding, or the community has adopted a significant noise standard less than DNL 65 dB.
(14) Mobile Homes or Mobile Classrooms. Mobile homes and Mobile Classrooms are not viable noise compatibility projects since their design and construction do not lend themselves to effective noise reduction measures. (Note that this is not the same thing as permanent modular buildings.)
(15) Noise Buffer Land – Not Airport Owned. Noise buffer land must be owned by the airport.

Table C-5 Examples of Prohibited Projects/Costs for Noise Mitigation

Examples include, but are not limited to…
(16) Noise Monitoring Equipment - Fixed in Certain Situations. Fixed noise monitoring equipment where the 14 CFR part 150 noise exposure maps (existing and forecast) show no noncompatible land uses or the sponsor is unable to clearly show that portable monitors would be inadequate.
(17) Noise Monitoring Systems – Unnecessary Capability. Flight tracking capabilities beyond that needed for noise monitoring, such as the ability to track 100% of flights and/or real time display of flight tracks.
(18) Noise Monitoring Systems – Vendor Data Retention. Systems where the data ownership remains with the vendor, not the sponsor as required.
(19) Noise Compatibility Program (NCP) Measures Approved in Fiscal Years 2004-2007 Outside the DNL 65 dB Noise Contour. Per 49 USC § 47504(b)(4), a 14 CFR part 150 approved NCP measure for a project to mitigate aircraft noise less than DNL 65 dB if the FAA approved the NCP in fiscal years 2004-2007. This fiscal year requirement does not apply to soundproofing schools and hospitals since they are not required to be in an approved NCP.
(20) Non-Aircraft Noise Mitigation. The mitigation must be based on aircraft noise associated with the airport.
(21) Operational or Administrative Costs for an Ongoing Program. A 14 CFR part 150 approved NCP measure for operational or administrative costs of a sponsor's ongoing noise mitigation program.
(22) Parts of Schools. Sound insulation of school facilities such as gymnasiums, cafeterias, and hallways unless approved by APP-400. These areas are not considered to be adversely affected by a given level of noise as areas such as classrooms that are eligible for funding.
(23) Projects/Costs Based on Noise Exposure Maps that Are Not Current. The requirements and exceptions are provided in Paragraph R-7.
(24) Terminal Based Air Conditioning, Heating, or Electric Power. Acquiring or installing terminal-based air or power systems is allowable as a terminal project, but is not fundable as a noise mitigation measure.
(25) Undefined Noise Benefit. A 14 CFR part 150 approved NCP measure for a project that is not described in sufficient detail to determine its noise mitigation benefits.
(26) Ventilation or Central Air Conditioning System Replacement. Ventilation systems or central air conditioning systems are allowable only in buildings that do not currently have a ventilation or central air conditioning system.

C-6. Examples of Planning or Environmental Prohibited Projects/Costs.

The list in Table C-6 is not comprehensive. Instead, it contains projects or costs specifically prohibited in the Act or whose eligibility is frequently questioned. Unless a specific reference to the Act is cited, these prohibitions are FAA policy.

Table C-6 Examples of Prohibited Projects/Costs for Planning or Environmental

Examples include, but are not limited to…
(1) All of the Examples in Table C-1.
(2) Airport Capital Improvement Plan – Stand-Alone. A stand-alone grant to update an airport's capital improvement plan. Capital plan development costs are only eligible if warranted as part of a master plan study or update grant.
(3) Airport Certification Manual Updates. Only the initial airport certification manual developed for a new 14 CFR part 139 airport with scheduled air carrier service greater than 9 seats and/or unscheduled air carrier service greater than 30 passenger seats is eligible. Per APP-500 policy, this is considered planning because it is necessary for the airport to begin operations. Updates are considered operational, not planning.
(4) Airport Emergency Plan – Stand-Alone. Preparation or update of an airport emergency plan as a stand-alone project. An Airport Emergency Plan is operational by nature and therefore ineligible. The cost of preparing an Airport Emergency Plan may be an allowable cost if it is included in an AIP funded airport master plan, is required by 14 CFR part 139, and will result in AIP eligible development.
(5) Airport Geographic Information System (GIS) - Certain Costs. Any GIS costs not specifically allowable under Paragraph 3-77, including: **(a) Under Pilot Program or Transition Policy.** Both the pilot program and the transition policy are complete, so stand-alone GIS grants under either of these are no longer eligible. **(b) Under State or Metropolitan System Planning.** State or metropolitan system planning studies are used to study the performance and interaction of an entire aviation system in a specific geographic area. As such, AIP-funded system planning grants may not include whole-airport surveys unless approved by APP-400 and APP-500.
(6) Airport Zoning Ordinance. The cost of preparation and adoption of an airport zoning ordinance unless the work is done as part of an airport master plan, noise compatibility program, or land use compatibility planning program for states and units of local government for compatible land use planning and projects around large and medium hub airports that have either never submitted a noise compatibility program or have not updated such program within the preceding ten years.
(7) ALP Update to Only Document What Has Already Been Constructed. A drafting effort to update an ALP to only document what has already been constructed is not eligible as stand-alone project. An ALP update is considered an *allowable cost* within an eligible planning study grant (see Appendix E) that address a future airport need or with a construction or land grant.
(8) Airport Master Planning Study – Certain Planning Elements. The following are not allowable elements in an airport master plan or as stand-alone planning projects.

Table C-6 Examples of Prohibited Projects/Costs for Planning or Environmental

Examples include, but are not limited to…
(a) Asset management planning **(b)** Aviation business park analysis **(c)** Business plans **(d)** Economic benefit studies **(e)** Information technology (IT) master plan or analysis **(f)** Marketing studies **(g)** Minimum standards development **(h)** Rates and charges analysis **(i)** Rules and regulations development **(j)** Snow removal plans **(k)** Strategic business plans **(l)** Surface movement guidance and control system (SMGCS) plans **(m)** Tower siting studies beyond what general areas will work unless AIP is paying for the tower
(9) Benefit-Cost Analysis – Stand-Alone Grant. A benefit-cost analysis in a stand-alone grant. A benefit-cost analysis for a project can only be reimbursed as project formulation costs once the benefit-cost analyses has shown that the associated project is economically viable.
(10) Competition Plans – Stand-Alone Grant. Development or update of a competition plan as a stand-alone grant.
(11) Computer Hardware – Planning Projects. Computer hardware in planning projects. This includes Geographic Information System planning and Safety Management System manual and implementation plan development.
(12) Environmental Management System Updates. Only the initial development is eligible.
(13) GIS Platform. If a sponsor wishes to integrate the FAA-required data with other GIS datasets, then the sponsor must secure the necessary platform to do so at their own expense, as with any other airport operating expense.
(14) Ineligible Project Environmental Analysis. Preparing an EA or other environmental analysis for an ineligible project.
(15) Mitigation Site Management and Protection. Sponsors are responsible for funding long – term management and protection of mitigation sites past the period of establishment.
(16) Monitoring Mitigation Sites beyond the Period Specified in an Environmental Determination. By FAA policy, funding for monitoring is limited to the period specified in an environmental determination, up to five years maximum.
(17) Planning Project Equipment. Equipment for planning purposes, such as aircraft counters.

Table C-6 Examples of Prohibited Projects/Costs for Planning or Environmental

Examples include, but are not limited to…
(18) Stand-Alone Planning Studies. Portions of system, metropolitan, or master planning projects as stand-alone planning studies unless they are listed as eligible stand-alone studies in Paragraph E-4.
(19) Surface Transportation Origin-Destination Surveys. If not required as part of Metropolitan Planning Organization coordination or as part of an eligible multimodal project, surveys to determine the modes of surface transportation airport users are using to get to and from the airport as well as where they are coming from or going to (hotel, home, etc.).

Appendix D. Miscellaneous Projects

D-1. How to Use This Appendix.

This appendix is not a valid stand-alone document for making eligibility and justification determinations. The information in this appendix must be used in conjunction with the Handbook, especially the project cost requirements in Chapter 3.

D-2. Airfield Needs Requirement for Revenue Producing Aeronautical Support Facilities.

Per 49 USC § 47110(h), the sponsor must certify that all airfield needs have been accommodated before the ADO can fund a revenue producing aeronautical support facilities. Per FAA policy, the sponsor must adequately demonstrate to the ADO that airside needs within the next three years (current fiscal year and next two future fiscal years) will be accommodated through local funds or nonprimary entitlement funds. It is APP-500 policy that the sponsor requests for AIP would be limited to non-primary entitlement funds during that time unless there is a specific safety issue that must be addressed and was not foreseeable under normal planning efforts of the sponsor.

D-3. Project Requirements.

In addition to the information provided in the above paragraphs and the following table, Appendix C contains examples of prohibited projects and costs and is very useful to use alongside this appendix.

Table D-1 Miscellaneous Project Requirements

What Can Be Done If Justified	Factors to Consider For Justification and Eligibility	Required Usable Unit of Work and Required Outcome	Work Code*
a. Stand-Alone Design Only Projects	**(1)** The ADO has every expectation that the associated development project will begin within two years after the design is completed. **(2)** The development work has not been started. If the work has been started, the ADO must include the design work in the development grant.	A set of plans and specifications that is ready to be bid.	Same as development project
b. Construct Wash Rack	**(1)** A wash rack is a pavement area with proper drainage and water runoff collection available for washing aircraft. **(2)** A wash rack is not technically considered apron construction, but a revenue-producing aeronautical support facility project, and	A fully functional wash rack that charges for services and is not exclusive use.	OT OT WR

Table D-1 Miscellaneous Project Requirements

What Can Be Done If Justified	Factors to Consider For Justification and Eligibility	Required Usable Unit of Work and Required Outcome	Work Code*
	maintenance and repair is not eligible. **(3)** The airport must be a nonprimary airport and only nonprimary entitlements may be used for the project. **(4)** All airfield needs have been accommodated per Paragraph D-2 **(5)** The ADO must ensure that the proper environmental permits have been obtained.		
c. Fuel Farms (Construct or Improve)	**(1)** For MAP funded projects, see Appendix T, as many of the following requirements do not apply. **(2)** The fuel farm must be owned by the sponsor. The current version of FAA Order 5190.6, FAA Airport Compliance Manual, contains detailed guidance on whether the sponsor may allow a fixed based operator to operate the fuel farm. **(3)** A fuel farm includes the bulk fuel storage tanks, the containment area, the pavement area needed for the fuel farm operations, and pumps and equipment needed to operate the fuel farm. In addition, since fuel trucks must be parked in a containment area when not in use, additional area in the containment area may also be included. It also may include self-service fuel pumps for the public (also referred to as credit card pumps). **(4)** Eligible fuel farm *construction* projects are limited to: **(a)** Initial construction of a fuel farm if the airport does not currently have a fuel farm. **(5)** Eligible fuel farm *improvement* projects are limited to:	A fully functional fuel farm that charges for services and is not exclusive use.	OT OT FF

Table D-1 Miscellaneous Project Requirements

What Can Be Done If Justified	Factors to Consider For Justification and Eligibility	Required Usable Unit of Work and Required Outcome	Work Code*
	(a) Initial installation of self-service fuel pumps. This can be done as a stand-alone project. **(b)** Installing facilities necessary to provide a fuel type not currently available at the airport (such as jet fuel). **(c)** Adding supplemental tanks if the sponsor is able to document to the ADO that the additional tanks are necessary based on increased demand and will therefore increase the revenue production at the airport. **(6)** A fuel farm is not technically considered apron construction, but a revenue-producing aeronautical support facility project, and maintenance and repair is not eligible. **(7)** The airport must be a nonprimary airport and only nonprimary entitlements may be used for the project. **(8)** All airfield needs have been accommodated per Paragraph D-2 **(9)** The facility must meet the requirements of 40 CFR § 112.8, Spill Prevention, Control, and Countermeasure Plan Requirements for On-Shore Facilities (excluding production facilities). **(10)** The ADO must ensure that the proper environmental permits have been obtained.		
d. Construct Deicing Pad *(Includes Associated Facilities)*	**(1)** An exclusive paved area for aircraft deicing or anti-icing activities is eligible if the improvements are to be owned by the airport and will become available on a non-exclusive use basis per 49 USC § 47102.	A fully functional aircraft deicing pad that meets FAA standards including aircraft and vehicle access.	ST AP DI

Table D-1 Miscellaneous Project Requirements

What Can Be Done If Justified	Factors to Consider For Justification and Eligibility	Required Usable Unit of Work and Required Outcome	Work Code*
	(2) A ground deicing pad includes the paved areas, drainage collection structures, treatment and discharge systems, lighting, paved access for deicing vehicles and aircraft. **(3)** The airport must be a commercial service airport. **(4)** This is not the same as a separate deicing containment facility required to serve the aircraft gate area at a terminal. See Appendix S for these projects.		
e. Parking Lot (Construct or Rehabilitate)	**(1)** For MAP funded projects, see Appendix T, as many of the following requirements do not apply. **(2)** The airport is a nonprimary commercial service, a nonhub primary airport, a reliever airport, or a general aviation airport. **(3)** The parking lot is non-revenue producing. **(4)** The parking lot is public-use. **(5)** Per 49 USC § 47119(c), this is considered an allowable cost of a terminal development project and must follow the terminal building funding rules in Table N-7. Stand-alone grants can be issued for eligible parking lots. **(6)** Per 49 USC § 47119(a)(1)(A), the airport has all safety equipment required for the airport per 49 USC § 44706 (Airport Operating Certificate), has all security equipment required by rule or regulation, and has provided for access by passenger to the area of the airport for boarding or exiting aircraft that are not air carrier aircraft.	A fully functional parking lot.	OT OT PA

Table D-1 Miscellaneous Project Requirements

What Can Be Done If Justified	Factors to Consider For Justification and Eligibility	Required Usable Unit of Work and Required Outcome	Work Code*
f. Remove obstructions to support Area Navigation (RNAV) Approach	**(1)** The project must be supported by a RNAV obstruction removal survey based on the airport category on the approved ALP. **(2)** Per 49 USC § 47102(3)(A)(i) and § 47102(4), the removal, lowering, relocating, lighting, and marking obstructions is eligible. **(3)** Per FAA policy, this obstruction removal for RNAV approach purposes may include: **(a) Airport Design Advisory Circular.** Obstruction removal necessary to meet the object clearing criteria in the current version of Advisory Circular 150/5300-13, Airport Design. There are many surfaces and areas contained in the object clearing criteria. They include, but are not limited to, object free areas, runway and taxiway safety areas, obstacle free zones, threshold obstacle clearance surfaces, NAVAID critical areas, 14 CFR part 77 surfaces, approach and departure surfaces, runway protection zones, runway visibility zones, and inside the building restriction line. The ADO must consult the current version of the advisory circular to determine the current requirements. **(b) 14 CFR part 77 Surfaces.** Per FAA policy, obstructions to the 14 CFR part 77 primary approach and 7:1 transitional surfaces. **(c) TERPS.** Any of the United States Standard for Terminal Instrument Procedures (TERPS) requirements. **(4)** Obstruction removal is limited to obtain 100 feet vertical clearance above the elevation of the runway	An RNAV approach that is clear of obstructions.	SP OT VI

Table D-1 Miscellaneous Project Requirements

What Can Be Done If Justified	Factors to Consider For Justification and Eligibility	Required Usable Unit of Work and Required Outcome	Work Code*
	ends but no more than 5000 feet beyond the end of the runway. **(5)** Obstruction removal is limited to the airport category shown on the approved ALP. **(6)** Rebuilding a facility in a new location is only eligible if the facility meets the requirements in Paragraph 3-74**.** **(7)** Obstruction removal within runway safety areas must meet the requirements and use the work codes in Appendix G.		
g. Obstructions (Light, Mark, or Remove) *(For Hazards)*	**(1)** Per 49 USC § 47102(3)(A)(i) and § 47102(4), the removal, lowering, relocating, lighting, and marking of airport hazards is eligible. **(2)** Per FAA policy, the object must be determined by the FAA Air Traffic Organization (ATO) to be a hazard (per the current version of FAA Order JO 7400.2, Procedures for Handling Airspace Matters), or would be a significant adverse operational impact if no action were taken (such as cancelling an approach, raising an approach minimum, or relocating the runway threshold). **(3)** This code is limited to obstructions that have a written ATO hazard determination. **(4)** Obstruction removal is limited to obtain 100 feet vertical clearance above the elevation of the runway ends but no more than 5000 feet beyond the end of the runway.	The elimination or mitigation of an airport hazard.	SA OT OB
h. Obstructions (Light, Mark, or Remove) *(For Standards)*	**(1)** Per 49 USC § 47102(3)(A)(i) and § 47102(4), the removal, lowering, relocating, lighting, and marking obstructions is eligible.	The elimination or mitigation of an airport obstruction.	ST OT OB

Table D-1 Miscellaneous Project Requirements

What Can Be Done If Justified	Factors to Consider For Justification and Eligibility	Required Usable Unit of Work and Required Outcome	Work Code*
	(2) Per FAA policy, obstructions are eligible standards projects based on the aircraft category on the approved ALP for that runway and may include: **(a) Airport Design Advisory Circular.** Obstruction removal necessary to meet the object clearing criteria in the current version of Advisory Circular 150/5300-13, Airport Design. There are many surfaces and areas contained in the object clearing criteria. They include, but are not limited to, object free areas, runway and taxiway safety areas, obstacle free zones, threshold obstacle clearance surfaces, NAVAID critical areas, 14 CFR part 77 surfaces, approach and departure surfaces, runway protection zones, runway visibility zones, and inside the building restriction line. The ADO must consult the current version of the advisory circular to determine the current requirements. **(b) 14 CFR part 77 Surfaces.** Per FAA policy, obstructions to the 14 CFR part 77 primary approach and 7:1 transitional surfaces. **(c) TERPS.** Any of the United States Standard for Terminal Instrument Procedures (TERPS) requirements. **(3)** Obstruction removal, lowering, lighting or marking is limited to obtain 100 feet vertical clearance above the elevation of the runway ends but no more than 5000 feet beyond the end of the runway. **(4)** Rebuilding a facility in a new location is only eligible if the facility		

Table D-1 Miscellaneous Project Requirements

What Can Be Done If Justified	Factors to Consider For Justification and Eligibility	Required Usable Unit of Work and Required Outcome	Work Code*
	meets the requirements in Paragraph 3-74. **(5)** Obstruction removal within runway safety areas must meet the requirements and use the work codes in Appendix G. **(6)** Obstruction removal, lowering, lighting or marking is limited to the airport category shown on the approved ALP. **(7)** Obstruction removal, lowering, lighting or marking to support Area Navigation (RNAV) approaches is covered elsewhere in this table and has a different work code. **(8)** If the obstruction removal, lowering, lighting or marking is part of a larger AIP project, it can be included in the code for that project.		
i. Heliport/Helipad (Construct, Expand, Improve, Modify, Rehabilitate)	**(1)** The ADO must contact AAS-100 for guidance. **(2)** If the project meets the definition of a capacity project CA HE CO must be used. If the project meets the definition of a standards project, ST HE CO must be used. Appendix A contains these definitions.	A fully functional heliport or helipad that meets FAA design standards.	CA HE CO ST HE CO
j. Seaplane Base (Rehabilitate)	**(1)** The ADO must contact AAS-100 for guidance.	A fully functional seaplane base that meets FAA design standards.	RE SB IM
k. Seaplane Base (Construct or Improve)	**(1)** The ADO must contact AAS-100 for guidance.	A fully functional seaplane base that meets FAA design standards.	ST SB CO
l. Improve Airport Drainage	**(1)** Stand-alone projects for drainage improvements are eligible to the extent that they are needed to serve areas eligible for AIP assistance.	Improved airport drainage that meets FAA design standards.	ST OT IM

Table D-1 Miscellaneous Project Requirements

What Can Be Done If Justified	Factors to Consider For Justification and Eligibility	Required Usable Unit of Work and Required Outcome	Work Code*
	(2) The ADO will determine the method of proration. Paragraph 3-97 contains proration examples.		
m. Improve Airport Erosion Control	**(1)** Stand-alone projects for erosion control (blast pads, installation of sod, etc.) are eligible to the extent that they are needed to protect AIP eligible facilities. **(2)** The ADO will determine the method of proration. Paragraph 3-97 contains proration examples.	A reduction in erosion.	ST OT IM
n. Improve Airport Miscellaneous Improvements	**(1)** The ADO must not use this work code without first consulting with APP-520 or APP-400 and obtaining their approval.	N/A	ST OT IM

*The official list of work codes can be obtained from the automated AIP system.

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Appendix E. Planning Projects

E-1. How to Use This Appendix.

This appendix is not a valid stand-alone document for making eligibility and justification determinations. The information in this appendix must be used in conjunction with the Handbook, especially the project cost requirements in Chapter 3.

E-2. Conditions for Posting Planning Documents on the Internet.

If the sponsor, or a sponsor's consultant, posts an AIP funded planning document on the internet, it is FAA policy that the public must not be required to register to view or download the document (even if the document is posted elsewhere without registration requirements). This is because the collection of personal data may be construed by the public as a surveillance tool for the airport, which may intimidate members of the public, dissuading them from reviewing the document. In addition 5 USC § 552a, The Privacy Act of 1974, prohibits the unnecessary collection of private data by Federal agencies.

E-3. Disclaimer for AIP Funded Planning Studies.

The sponsor must include the following disclaimer and the AIP grant number on the inside front cover of each final narrative report of all AIP funded planning studies.

"The preparation of this document was supported in part with financial assistance through the Airport Improvement Program from the Federal Aviation Administration (AIP Grant Number _____) as provided under Title 49 USC § 47104. The contents do not necessarily reflect the official views or policy of the FAA. Acceptance of this report by the FAA does not in any way constitute a commitment on the part of the United States to participate in any development depicted therein, nor does it indicate that the proposed development is environmentally acceptable in accordance with appropriate public laws."

E-4. Stand-Alone Master Plan and System Plan (Metropolitan and State) Projects.

Table E-1 contains a list of studies that can be funded as stand-alone planning projects if the ADO determines that they are both necessary and reasonable in scope

Table E-1 Eligible Stand-Alone Planning Projects

Eligible stand-alone projects (coded PL PL MS unless otherwise noted) are limited to…
a. Airport Certification Manuals. Only the initial airport certification manual developed for a newly certificated 14 CFR part 139 airport with scheduled air carrier service greater than 9 seats and/or unscheduled air carrier service greater than 30 passenger seats is eligible. Per APP-500 policy, this is considered planning because it is necessary for the airport to begin operations. Updates are considered operational, not planning.
b. Airport Energy Efficiency Assessment. See Appendix S.

Table E-1 Eligible Stand-Alone Planning Projects

Eligible stand-alone projects (coded PL PL MS unless otherwise noted) are limited to…
c. Airport Sustainability Plans. If done as a separate stand-alone study outside of a master plan, see Appendix S.
d. Develop Environmental Management System (EMS). See Appendix S
e. Drainage Studies. See Appendix S.
f. Disparity Studies. The purpose of a disparity study is to determine whether there is evidence of discrimination or its effects showing a compelling need for an airport sponsor's DBE program. A disparity study will show whether there is evidence of discrimination supporting the need for race-based measures. The ADO must contact the FAA Office of Civil Rights (ACR) as soon as this type of study is proposed**.** This can only be done as a state or metropolitan system planning project.
g. Environmental Studies. See Appendix S**.**
h. Feasibility Studies. These are eligible for establishing a new airport or replacing an existing airport.
i. Noise Compatibility Plan. See Appendix R.
j. Obstruction Surveys. This normally involves a survey for all of the runways on an airport and is performed to identify existing obstructions to the existing runway approaches. Aeronautical surveys for Area Navigation (RNAV) approaches have a separate work code as listed in Table E-2. This can be done as a state or metropolitan system planning project.
k. Pavement Management Programs. This is a two part planning process. First, a pavement condition index (PCI) survey is conducted on eligible public use airfield pavements to establish the current condition of the airfield pavement. Second, a pavement maintenance program is developed to address how the airfield pavement will be maintained or upgraded to acceptable PCI levels. The current version of Advisory Circular 150/5380-7, Airport Pavement Management Program, provides detailed guidance on the preparation of pavement management programs. These two parts can be completed together, or under separate grants, however, the end result must be a pavement management program. Calculation of the pavement classification numbers (PCN) of the AIP eligible pavement at the airport per the current version of Advisory Circular 150/5335-5, Standardized Method of Reporting Airport Pavement Strength (PCN).is an allowable cost of a pavement management program. The cost to incorporate this information into the airport layout plan is also allowable. This can be done as a state or metropolitan system planning project.
l. Initial Pavement Classification Number Study. A study for the initial determination of pavement classification numbers (PCN) of the AIP eligible pavement at the airport per the current version of Advisory Circular 150/5335-5, Standardized Method of Reporting Airport Pavement Strength (PCN) is eligible. The cost to incorporate this information into the airport layout plan is also allowable. After this study is complete, the sponsor must complete PCN updates as part of their pavement management program or as part of the applicable pavement construction project, and must update the ALP accordingly. This can be done as a state or metropolitan system planning project.

Table E-1 Eligible Stand-Alone Planning Projects

Eligible stand-alone projects (coded PL PL MS unless otherwise noted) are limited to…
m. Recycling Plans. These types of plans are eligible under 49 USC § 47102(5)(C) and include developing a plan for recycling and minimizing the generation of airport solid waste, consistent with applicable state and local recycling laws. The cost of a waste audit is an allowable cost under these plans. The scope of these plans must be consistent with the current version of Guidance on Airport Recycling, Reuse, and Waste Reduction Plans (see Appendix B for link).
n. Site Selection Studies. A site selection study requires a completed ADO approved feasibility study.
o. State or Metropolitan System Plan Economic Impact Study. This can only be done as a state or metropolitan system planning project.
p. State or Metropolitan System Plan Multi-Airport Acoustical Counting Study. This can only be done as a state or metropolitan system planning project.
q. Terminal Area Narrative Reports. This may be appropriate if a terminal lacks capacity, has specific security needs, or if the aircraft fleet mix has changed at the airport impacting the terminal building space and use. This is limited to the passenger terminal building and associated facilities (a Triggering Event Narrative Report is appropriate for all other facilities). In addition, only planning, not preliminary design, is eligible under this project. The deliverable for a Terminal Area Narrative Report may result in an information revision to an ALP that identifies the airport's *future needs* (as opposed to simply reflecting previous changes and/or existing conditions) rather than a formal revision reissuing a new ALP.
r. Triggering Event Narrative Reports and Airport Layout Plan. Not all airports need to do all of the elements identified in the current version of Advisory Circular 150/5070-6, Airport Master Plans. In some cases, an ALP Narrative Report and an ALP update may suffice. In addition, if a specific area of an airport has changed functionality due to a triggering event, and a complete master plan is not necessary, a Triggering Event Narrative Report (and associated update to the airport layout plan) may be appropriate. Examples of triggering activities that may drive a Triggering Event Narrative Report are the introduction of new carriers, increased or decreased cargo activity, increased or decreased general aviation activity, a proposed residential through-the-fence operation, new availability of building areas or property, or changes to a nearby airport. The deliverable for a Triggering Event Narrative Report may result in an information revision to an ALP that identifies the airport's *future needs* (as opposed to simply reflecting previous changes and/or existing conditions) rather than a formal revision reissuing a new ALP.
s. Other Specifically Approved Stand-Alone Projects. Stand-alone projects that APP-500 and APP-400 have approved in writing prior to the ADO approving the scope of the project, such as a state system plan general aviation security study, or a state or metropolitan system plan surface access study.

E-5. Project Requirements Table.

In addition to the information provided in the above paragraphs and the following table, Appendix C contains examples of prohibited projects and costs and is very useful to use alongside this appendix.

Table E-2 Planning Project Requirements

What Can Be Done If Justified	Factors to Consider For Justification and Eligibility	Required Usable Unit of Work and Required Outcome	Work Code*
a. State System Plan Study (Conduct or Update)	**(1)** The ADO must have determined that the plan is necessary and justified and approved the scope of work. The needs of airports differ in as many ways as there are airports. Although similar airports with similar roles may share common characteristics, system planning looks at specific needs and assets at the airports in question. Not all of the elements identified in the current version of Advisory Circular 150/5070-7, The Airport System Planning Process will be required for all airports in the system plan. **(2)** APP-400 is available to answer questions regarding which elements in these plans are justified and how often the plans must be updated. **(3)** Table E-1 contains a list of stand-alone planning projects. The specific stand-alone projects that can be conducted on a state system planning level are noted. **(4)** The sponsor is a planning agency sponsor as defined in Table 2-4.	A completed state system plan that meets FAA advisory circular requirements and the ADO has officially accepted.	PL PL ST (full state system plan study) *Note: The ADO must use Conduct/ Update Miscellaneous Study (PL PL MS) for eligible stand-alone projects in Paragraph E-3.*

Table E-2 Planning Project Requirements

What Can Be Done If Justified	Factors to Consider For Justification and Eligibility	Required Usable Unit of Work and Required Outcome	Work Code*
b. Metropolitan System Plan Study (Conduct or Update)	**(1)** The ADO must have determined that the plan is necessary and justified and approved the scope of work. The needs of airports differ in as many ways as there are airports. Although similar airports with similar roles may share common characteristics, metropolitan planning looks at specific needs and assets at the airports in question. Not all of the elements identified in the current version of Advisory Circular 150/5070-7, The Airport System Planning Process will be required for all airports in the system plan. **(2)** APP-400 is available to answer questions regarding which elements in these plans are justified and how often the plans must be updated. **(3)** Table E-1 contains a list of stand-alone planning projects. The specific stand-alone projects that can be conducted on a metropolitan system planning level are noted. **(4)** The sponsor is a planning agency sponsor as defined in Table 2-4.	A completed metropolitan system plan that meets FAA advisory circular requirements and the ADO has officially accepted.	PL PL ME (full metropolitan system plan study) *Note: The ADO must use Conduct/ Update Miscellaneous Study (PL PL MS) for eligible stand-alone projects in Paragraph E-3.*
c. Airport Master Plan Study (Conduct or Update)	**(1)** The ADO must have determined that the plan is necessary and justified and approved the scope of work. The needs of airports differ in as many ways as there are airports. Although similar airports with similar roles may share common characteristics, master planning looks at the specific needs and assets at the airport in question. Not all airports need to do all of the elements identified in the current	An FAA accepted master plan and FAA approved airport layout plan that meet FAA advisory circular requirements and identifies the airport's future needs (as opposed to simply reflecting previous changes and/or	PL PL MA (full master plan study) *Note: The ADO must use Conduct/ Update Miscellaneous Study (PL PL MS) for eligible stand-alone*

Table E-2 Planning Project Requirements

What Can Be Done If Justified	Factors to Consider For Justification and Eligibility	Required Usable Unit of Work and Required Outcome	Work Code*
	version of Advisory Circular 150/5070-6, Airport Master Plans. In some cases, an ALP Narrative Report and an ALP update may suffice. **(2)** APP-400 is available to answer questions regarding which elements in these plans are justified and how often the plans must be updated. **(3)** Table E-1 contains a list stand-alone planning projects. **(4)** The ADO must contact APP-520 for sponsors that own multiple airports to issue a single grant to conduct master plans for the sponsor's airports. This is not considered a state or metropolitan system plan, but is similar to a state's Various Locations grants. APP-520 will advise the ADO whether or not the automated AIP system will allow tracking projects at different sponsor airports under one grant. **(5)** Per 49 USC § 47102(5)(C), the master plan must address issues related to solid waste recycling at the airport. The scope of these plans must be consistent with the current version of Guidance on Airport Recycling, Reuse, and Waste Reduction Plans maintained by APP-400. **(6)** Per 49 USC § 47102(5)(C), the FAA Modernization and Reform Act of 2012 (Public Law 112-95) also made the cost of a waste audit an allowable master planning element. **(7)** Airport sustainability planning is also an allowable master	existing conditions).	*projects in Paragraph E-3.*

Table E-2 Planning Project Requirements

What Can Be Done If Justified	Factors to Consider For Justification and Eligibility	Required Usable Unit of Work and Required Outcome	Work Code*
	planning element (or can be funded as a separate planning study as detailed in Appendix S.		
d. Conduct an Aeronautical Survey for Area Navigation (RNAV) Approach	**(1)** APP-400 must have concurred with the survey (to avoid duplication of effort with the RNAV office) before the ADO can program the grant. **(2)** The project may include the allowable cost to upload the data in the FAA Airports GIS program. **(3)** The project must meet the minimum requirements of the current versions of FAA advisory circulars addressing airport surveys.	A set of electronic airport data that meets FAA standards.	PL PL VI
e. Prepare SMS Manual	**(1)** The project must meet the minimum requirements of the current version of FAA Order 5200.11, FAA Airports (ARP) Safety Management System. **(2)** This is an eligible project for all airports, however, the ADO must determine that the project costs for airports that are not 14 CFR part 139 certificated are reasonable and reflect the scale and complexity of the airports infrastructure and operating environment. **(3)** The sponsor must receive ADO approval of the scope of work, deliverables, and cost estimates in order for the costs to be considered allowable. **(4)** Development of an SMS manual remains eligible even if an airport chooses to include the SMS manual in its Airport Certification Manual.	An SMS manual and implementation plan that meets the requirements of AAS-300.	SA PL MS

Table E-2 Planning Project Requirements

What Can Be Done If Justified	Factors to Consider For Justification and Eligibility	Required Usable Unit of Work and Required Outcome	Work Code*
	(5) Only the portions of the Implementation Plan and SMS Manual that outline the sponsor's initiatives to enforce airport policies and procedures, such as rules and regulations, minimum standards, or other existing controls are allowable. The plan can help establish safety protocols that affect users of the airport, but the costs associated with helping users of the airport manage their own operations are not allowable costs. **(6)** If a sponsor chooses to include aspects in the SMS manual and implementation plan that are outside the control of the sponsor, the sponsor must provide proration calculations for the ADO to exclude these costs from the grant. If the ADO does not agree with the prorated costs, the sponsor must revise the proration to address the concerns. The ADO also has the option to disallow the inclusion of these aspects from the SMS manual and implementation plan. In addition, the requirements for including ineligible or non-AIP funded work in the contract in Paragraph 3-39 must be met. **(7)** One time (initial) acquisition of airport-owned software applications that are specifically designed to support airport SMS implementation will be considered an allowable cost providing all of the following requirements are met: **(a)** The sponsor has demonstrated to the ADO that the software is necessary for		

Table E-2 Planning Project Requirements

What Can Be Done If Justified	Factors to Consider For Justification and Eligibility	Required Usable Unit of Work and Required Outcome	Work Code*
	successful SMS implementation consistent with the size and complexity of the airport; **(b)** The sponsor has completed the SMS manual for FAA review and acceptance before selecting or specifying computer software; **(c)** The sponsor agrees to share sanitized data with the FAA; **(d)** The software is a deliverable as part of the SMS planning study; and **(e)** The allowable cost of the software is limited to $50,000 per airport sponsor, based on demonstrated justification. **(8)** Other SMS activities and costs associated with a project must be included as project formulation costs or preliminary project costs for the grant for that project (see Paragraph 3-86 for additional details).		
f. Wildlife Hazard Assessments *(Or Wildlife Hazard Site Visits)*	**(1)** AAS-300 has made a determination that wildlife hazard assessments are justified at the following types of airports: **(a)** General aviation (and reliever) airports that have 100 or more based jets. **(b)** General aviation (and reliever) airports that have 75,000 or more annual operations. **(c)** 14 CFR part 139 airports. **(2)** AAS-300 has determined that general aviation (and reliever) airports with fewer than 100 based jets or less than 75,000 annual operations may only need a wildlife hazard site visit.	For a wildlife hazard site visit, an FAA accepted wildlife hazard site visit report with an associated written sponsor adoption of the report recommendations. For a wildlife hazard assessment, an FAA accepted wildlife hazard assessment mitigation plan with an associated	PL PL WH

Table E-2 Planning Project Requirements

What Can Be Done If Justified	Factors to Consider For Justification and Eligibility	Required Usable Unit of Work and Required Outcome	Work Code*
	The regional office (or if delegated to the ADO, the ADO) will determine if a wildlife hazard assessment is needed (and therefore eligible) based on the results of the site visit. **(3)** A wildlife hazard management plan must be based on a wildlife hazard assessment. This wildlife hazard management plan is eligible as part of the wildlife hazard assessment project. Normally the wildlife hazard management plan is done within the same grant. However, the wildlife hazard management plan is eligible as a stand-alone grant as long as it is based on an FAA-approved wildlife hazard assessment. **(4)** For a wildlife hazard site visit, the sponsor must submit the following information (referred to as an Adoption of Wildlife Hazard Site Visit Recommendations) to the ADO: **(a)** The airport name, LOCID, city and state. **(b)** The airport manager name and airport sponsor name. **(c)** The biologist name, company/agency, and date of wildlife hazard site visit. **(d)** A table that contains the list of accepted recommendation from the wildlife hazard site visit, who is responsible for carrying out the recommendation, and the frequency the recommendation will be performed. **(e)** A table that contains the list of remaining recommendations	wildlife hazard management plan.	

Table E-2 Planning Project Requirements

What Can Be Done If Justified	Factors to Consider For Justification and Eligibility	Required Usable Unit of Work and Required Outcome	Work Code*
	not accepted from the wildlife hazard site visit and the reason each recommendation is not being accepted. **(f)** A statement as follows: *"I hereby certify that this is a complete and accurate listing of responses to the foregoing items and have prepared documentation attached hereto for any item marked "no"."* **(g)** The signature of the sponsor's designated official representative, the typed name and title of this representative, and the date of the signature. **(5)** The sponsor must first solicit qualifications from private sector firms under either the competitive proposal process or the small procurement process (see 2 CFR § 200.319 and 2 CFR § 200.320 in Appendix U for these requirements). Since the U.S. Department of Agriculture (USDA) Wildlife Services (WS) is a governmental entity, the sponsor cannot include USDA WS as a qualified source under these procurement processes. However, the sponsor can separately obtain price and schedule information from USDA WS. If the sponsor determines that the qualified sources cannot reasonably or expeditiously provide the services, the sponsor may opt to use USDA WS as long as the sponsor provides a written statement to the ADO to this affect prior to the grant application. The ADO must		

Table E-2 Planning Project Requirements

What Can Be Done If Justified	Factors to Consider For Justification and Eligibility	Required Usable Unit of Work and Required Outcome	Work Code*
	include this written statement in the grant file. **(6)** AAS-300 is available for specific guidance on the scope of wildlife hazard assessments and wildlife hazard sight visits.		

*The official list of work codes can be obtained from the automated AIP system.

Appendix F. New Airport Projects

F-1. How to Use This Appendix.

This appendix is not a valid stand-alone document for making eligibility and justification determinations. The information in this appendix must be used in conjunction with the Handbook, especially the project cost requirements in Chapter 3.

F-2. Project Requirements Tables.

In addition to the information provided in the above paragraphs and the following tables, Appendix C contains examples of prohibited projects and costs and is very useful to use alongside this appendix.

Table F-1 New Airport Work Codes

If the project is justified as follows…	Use the following work codes…
a. The project meets the definition of a capacity project (see Appendix A).	CA NA CO
b. The project meets the definition of a standards project (see Appendix A).	ST NA CO

Table F-2 New Airport Project Requirements

What Can Be Done If Justified	Factors to Consider For Justification and Eligibility	Required Usable Unit of Work and Required Outcome	Work Code*
a. Construct New Airport *(Replacement)*	**(1)** The airport is needed to replace an existing airport that is unable to meet long-term aviation demand in the community because the existing airport is constrained. **(2)** The ADO must notify APP-400 as soon the ADO becomes aware that a new airport is being considered and the ADO must keep APP-400 involved during the entire process. **(3)** APP-400 concurrence and APP-1 approval are required prior to issuing a grant for the feasibility study. A feasibility study to replace a NPIAS airport can be	A new airport constructed to FAA design standards.	ST NA CO CA NA CO See Table F-1 for the correct work code.

Table F-2 New Airport Project Requirements

What Can Be Done If Justified	Factors to Consider For Justification and Eligibility	Required Usable Unit of Work and Required Outcome	Work Code*
	undertaken without adding the new airport to the NPIAS. **(4)** The ADO must not issue a grant for any work beyond the feasibility study unless all of the following criteria have been met: **(a)** The sponsor has completed the feasibility study. **(b)** The ADO has concurred that the feasibility study supports the replacement airport. **(c)** ADO has obtained APP-400 concurrence and APP-1 approval prior to APP-400 adding the airport to the NPIAS. **(d)** The sponsor has submitted a signed request for release of the existing airport that includes a plan on how the airport revenue will be reinvested in the new airport per the current version of FAA Order 5190.6, FAA Airport Compliance Manual. **(e)** The FAA has approved the release of the old airport and the reinvestment plan. Generally, the existing airport will not be closed until the new airport is opened. **(f)** The sponsor has agreed to permanently close the existing airport when the new airport opens. **(g)** If the airport is a capacity project (historically, the majority have been standards projects), the benefit-cost analysis (BCA) requirements in Paragraph 3-14 have been met. **(5)** Value Engineering must be used for new primary airports as outlined in Paragraph 3-54.		

Table F-2 New Airport Project Requirements

What Can Be Done If Justified	Factors to Consider For Justification and Eligibility	Required Usable Unit of Work and Required Outcome	Work Code*
	(6) Per 49 USC § 47106(c)(1)(A)(i), the sponsor must provide an opportunity for a public hearing as part of meeting the environmental requirements. **(7)** The justifications for AIP funded airport facilities (runways, terminals, etc.) must follow the guidelines in the specific tables for those items.		
b. Construct New Airport *(Supplemental)*	**(1)** The airport is needed to supplement an existing NPIAS airport and the existing NPIAS airport stays open. It would be unusual to have a new general aviation airport supplement an existing general aviation airport. Typically, a supplemental airport would be considered to provide additional capacity for a large, medium, or small hub airport. **(2)** The ADO must notify APP-400 as soon the ADO becomes aware that a new airport is being considered and the ADO must keep APP-400 involved during the entire process. **(3)** The ADO has obtained APP-400 concurrence and APP-1 approval prior to issuing a grant for the feasibility study. A feasibility study to supplement a NPIAS airport can be undertaken without adding the new airport to the NPIAS. **(4)** The ADO must not issue a grant for any work beyond the feasibility study unless all of the following criteria have been met: **(a)** The sponsor has completed the feasibility study. **(b)** The ADO has concurred that the feasibility study supports the replacement airport.	A new airport constructed to FAA design standards.	CA NA CO

Table F-2 New Airport Project Requirements

What Can Be Done If Justified	Factors to Consider For Justification and Eligibility	Required Usable Unit of Work and Required Outcome	Work Code*
	(c) ADO has obtained APP-400 concurrence and APP-1 approval prior to APP-400 adding the airport to the NPIAS. **(d)** The benefit-cost analysis (BCA) requirements in Paragraph 3-14 have been met. **(5)** Value Engineering must be used for new primary airports as outlined in Paragraph 3-54. **(6)** Per 49 USC § 47106(c)(1)(A)(i), the sponsor must provide an opportunity for a public hearing as part of meeting the environmental requirements. **(7)** The justifications for AIP funded airport facilities (runways, terminals, etc.) must follow the guidelines in the specific tables for those items.		
c. Construct New Airport *(Additional)*	**(1)** The community must not have an existing NPIAS airport. **(2)** The ADO must notify APP-400 as soon the ADO becomes aware that a new airport is being considered and the ADO must keep APP-400 involved during the entire process. **(3)** The ADO has obtained APP-400 concurrence and APP-1 approval that an additional NPIAS location is feasible and would meet entry criteria. APP-400 must identify the additional airport in the NPIAS before the ADO can program any grants for the additional airport. A feasibility study can be undertaken once the new location is added to the NPIAS. **(4)** The ADO must not program a grant for any work other than a feasibility study until all of the following criteria have been met:	A new airport constructed to FAA design standards.	CA NA CO

Table F-2 New Airport Project Requirements

What Can Be Done If Justified	Factors to Consider For Justification and Eligibility	Required Usable Unit of Work and Required Outcome	Work Code*
	(a) The sponsor has completed the feasibility study. **(b)** The ADO has concurred that the feasibility study supports the replacement airport. **(c)** ADO has obtained APP-400 concurrence and APP-1 approval prior to APP-400 adding the airport to the NPIAS. **(d)** The benefit-cost analysis (BCA) requirements in Paragraph 3-14 are met. **(5)** Value Engineering must be used for new primary airports as outlined in Paragraph 3-54. **(6)** Per 49 USC § 47106(c)(1)(A)(i), the sponsor must provide an opportunity for a public hearing as part of meeting the environmental requirements. **(7)** The justifications for AIP funded airport facilities (runways, terminals, etc.) must follow the guidelines in the specific tables for those items.		
d. Acquire Existing Airport	**(1)** These requirements are typically for a public sponsor acquiring a privately-owned airport or possibly another public-owned airport. **(2)** These requirements do not apply to airports under the Military Airport Program (those requirements are contained in Section 3 of Chapter 6). **(3)** The ADO must notify APP-400 as soon the ADO becomes aware that acquisition is being considered and the ADO must keep APP-400 involved during the entire process. **(4)** If the airport is not in the NPIAS (including non-NPIAS former	Acquisition of an airport that meets, or can be upgraded to meet FAA standards.	ST NA AQ

Table F-2 New Airport Project Requirements

What Can Be Done If Justified	Factors to Consider For Justification and Eligibility	Required Usable Unit of Work and Required Outcome	Work Code*
	military or joint use airports not in the Military Airport Program), the ADO must obtain APP-400 concurrence and APP-1 approval prior to issuing a grant for the feasibility study. A feasibility study to replace a NPIAS airport can be undertaken without adding the new airport to the NPIAS. If the airport is in the NPIAS, a feasibility study is not required. **(5)** The ADO must not issue a grant for any work beyond the feasibility study unless all of the following criteria have been met: **(a)** The sponsor has completed the feasibility study. **(b)** The ADO has concurred that the feasibility study supports the replacement airport. **(c)** If the airport is not in the NPIAS, the ADO has obtained APP-400 concurrence and APP-1 approval prior to APP-400 adding the airport to the NPIAS. **(d)** If the existing airport is in the NPIAS, the ADO has obtained ACO-100 and APP-500 approval prior to programming the grant. **(6)** The justifications for AIP funded acquisition of the airport facilities (runways, terminals, etc.) must follow the guidelines in the specific tables for those items. **(7)** If the airport is a former military or joint use airport (not in the Military Airport Program), the AIP eligible work is limited to buying out the non-Federal tenants for eligible facilities. This is because the federally owned portions of the airport must be transferred, not purchased. The ADO must contact APP-400 and obtain		

Table F-2 New Airport Project Requirements

What Can Be Done If Justified	Factors to Consider For Justification and Eligibility	Required Usable Unit of Work and Required Outcome	Work Code*
	additional guidance on this process.		

*The current list of work codes can be obtained from the automated AIP system.

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Appendix G. Runway Projects

G-1. How to Use This Appendix.

This appendix is not a valid stand-alone document for making eligibility and justification determinations. The information in this appendix must be used in conjunction with the Handbook, especially the project cost requirements in Chapter 3.

G-2. Secondary, Crosswind and Additional Runways.

Per FAA policy, the ADO can only fund a single runway at an airport unless the ADO has made a specific determination that one or more crosswind or secondary runways are justified. The requirements, justification and eligibility for runways are listed in Table G-1.

Before planning a project on a runway, the ADO must determine the type of runway (primary, secondary, crosswind, or additional).

A runway that is not a primary runway, a secondary runway, or a crosswind runway is considered to be an *additional* runway. It is not unusual for a two-runway airport to have a primary runway and an additional runway, and no secondary or crosswind runway. This is because the ADO can only designate a runway as a secondary runway or crosswind runway if it meets the specific operating and justification parameters in Table G-1. Note that at busy airports, there may be more than one secondary and/or crosswind runways.

Additional runways are not eligible. Any development such as marking, lighting, or maintenance projects on an additional runway is also ineligible. There may be specific situations where additional runways may be considered a secondary or crosswind runway, however, APP-400 and APP-500 must concur with this reclassification.

Table G-1 Runway Types and Eligibility

For the following runway type…	Must meet all of the following criteria…	And is…
a. Primary Runway	**(1)** A single runway at an airport is eligible for development consistent with FAA design and engineering standards.	Eligible
b. Crosswind Runway	**(1)** One of the following two criteria are met: **(a)** For the first crosswind, the wind coverage on the primary runway less than 95% **(b)** For more than one crosswind runway, the wind coverage on the primary runway less than 95% and the existing crosswind runway(s) are operating at 60% or more of their annual capacity, which is based on guidance developed by APP-400 as the threshold for considering when to plan a new runway.	Eligible if justified

Table G-1 Runway Types and Eligibility

For the following runway type…	Must meet all of the following criteria…	And is…
c. Secondary Runway	**(1)** There is more than one runway at the airport. **(2)** This is not a crosswind runway. **(3)** Either of the following: **(a)** The primary runway (or primary runway AND all secondary runways) is operating at 60% or more of its annual capacity, which is based on guidance developed by APP-400 as the threshold for considering when to plan a new runway. **(a)** APP-400 has made a specific determination that the runway is required for operation of the airfield.	Eligible if justified.
d. Additional Runway	**(1)** There is more than one runway on the airport. **(2)** The ADO has determined that this runway does not meet the requirements to be designated a crosswind runway. **(3)** The ADO has determined that this runway does not meet the requirements to be designated a secondary runway.	Ineligible.

G-3. Pavement Condition Index Requirements for Airfield Pavement Projects.

For an airfield pavement project, the ADO may justify pavement work based on the thresholds listed in Table G-2. The ADO has the option to fund pavement work outside of these thresholds if the ADO determines that the work is justified based on engineering analysis and the ADO obtains concurrence from AAS-100. The definitions (and eligibility restrictions by airport type) for reconstruction, rehabilitation, and maintenance are defined in Paragraph 3-6.

Table G-2 Pavement Condition Index Requirements for Airfield Pavement Projects

For the following type of airfield pavement project…	The pavement condition index (PCI) must be less than…
a. Reconstruction	55 (Poor)
b. Rehabilitation	70 (Fair)
c. Maintenance	N/A

G-4. Project Requirements Tables.

In addition to the information provided in the above paragraph and the following tables, Appendix C contains examples of prohibited projects and costs and is very useful to use alongside this appendix.

Table G-3 Distinctions between Construct, Extend, Widen, Strengthen, Rehabilitate, Shift, and Remove

Use the following description…	If the project will…
a. Construct	Build a brand new runway.
b. Extend	Add additional length to a runway.
c. Widen	Increase the pavement width.
d. Strengthen	Will allow the pavement to accommodate a heavier class of aircraft.
e. Rehabilitate	Improves the pavement for the same class of aircraft.
f. Shift	Keep the same length, but move both ends of the runway.
g. Remove	Only remove pavement.

Table G-4 Runway Work Codes

If the project is justified as follows…	Use the following work codes…
a. The project meets the definition of a capacity project (see Appendix A).	CA RW CO (construct) CA RW EX (extend)
b. The project meets the definition of a standards project (see Appendix A).	ST RW CO (construct) ST RW CO (shift) ST RW CO (remove) ST RW IM (extend) ST RW IM (widen) ST RW IM (strengthen)
c. The project is justified in an environmental finding or 14 CFR part 150 program for environmental reasons. The project must be a condition of the environmental finding or 14 CFR part 150 program.	EN RW CO (construct)

Table G-5 Runway Project Requirements

What Can Be Done If Justified	Factors to Consider For Justification and Eligibility	Required Usable Unit of Work and Required Outcome	Work Code*
a. Runway (Construct, Extend, Widen, Strengthen, Shift)	**(1)** Where a study is required to demonstrate need, the FAA must have accepted the study and concurred with the need. **(2)** For a runway capacity project intended to relieve scheduled commercial air service congestion or add capacity for scheduled commercial air service in metropolitan areas with a large or medium hub airport, the ADO must confirm consistency with a regional or state system plan document (if available) prior to programming the grant. **(3)** The length, width, and strength of the pavement work must be based on critical aircraft justification per Paragraph 3-10. The exception is if the project meets the requirements in Paragraph 3-24 to exceed FAA design standards. **(4)** Runways must be planned, designed and constructed in accordance with current FAA standards, including clearing the approach slopes that will be used upon completion of the project. For runway projects, object clearing and approach surfaces must be appropriate to the instrument approach procedures for that runway. If the approaches to a new runway or extended runway end will not be clear, the project does not meet FAA standards. **(5)** If the runway has a non-standard runway protection zone (RPZ), the RPZ requirements per the current version of Advisory Circular 150/5300-13, Airport Design must be followed.	An operational runway constructed to FAA design standards, including required proper access, clear approaches, shoulders, turf along edge of shoulders, signs, marking, and lighting.	CA RW CO CA RW EX ST RW CO ST RW IM EN RW CO See Table G-4 for the correct work code.

Table G-5 Runway Project Requirements

What Can Be Done If Justified	Factors to Consider For Justification and Eligibility	Required Usable Unit of Work and Required Outcome	Work Code*
	(6) Crosswind runways may be justified if the crosswind criteria of 95% wind coverage are not met on the primary runway. In addition, the justification must be based upon the number and type of aircraft that would use the crosswind in accordance with current APP-400 policy. **(7)** The approval criteria and coding for turf and aggregate runways is the same as for paved runways. If this project is required because the FAA Office of Aviation Safety (AVS) has issued a finding that ultralight aircraft must be relocated from the paved runway, the ADO must contact AAS-100 for further guidance. **(8)** Per 49 USC § 47106(c)(1)(A)(i), the sponsor must provide an opportunity for a public hearing for a new runway or major runway extension as part of meeting the environmental requirements. **(9)** The project may include runway safety area improvements (stand-alone projects are also covered in this table) or other runway approach obstruction removal (stand-alone projects are covered in Appendix D). **(10)** Runway lighting may be included for the new runway pavement as long as it meets the runway lighting requirements in Appendix J. Per APP-520 policy, runway lighting for existing pavement must be coded as a lighting project unless the lighting is in pavement lighting (then it can coded under the runway project). **(11)** The difference between construct, expand, modify, improve,		

Table G-5 Runway Project Requirements

What Can Be Done If Justified	Factors to Consider For Justification and Eligibility	Required Usable Unit of Work and Required Outcome	Work Code*
	rehabilitate, shift, and remove is listed in Table G-3. **(12)** The runway must be eligible and justified as a primary, crosswind, or secondary runway per the requirements in Paragraph G-2.		
b. Groove Runway	**(1)** Grooving is eligible as a stand-alone project at a commercial service airport as either part of a project on the runway (code under that runway project) or as a stand-alone project. **(2)** Grooving of a non-commercial service airport is justified for the following two situations: **(a)** Runways over 5,000 feet. **(i)** The runway must serve turbojet aircraft. **(ii)** The grooving may either be included as part of the runway project (code under that runway project) or as a stand-alone project. **(b)** Runways between 4,000 feet to 5,000 feet. **(i)** There is either one or more based turbo jet aircraft or there is documented history of turbojet aircraft operations on that runway. **(ii)** The grooving is only eligible as part of runway rehabilitation, reconstruction, or construction project (code under that runway project). Grooving is not eligible as a stand-alone project. **(3)** The runway must be eligible and justified as a primary, crosswind, or secondary runway per the requirements in Paragraph G-2.	An operational runway with surface treatment.	SP RW FR

Table G-5 Runway Project Requirements

What Can Be Done If Justified	Factors to Consider For Justification and Eligibility	Required Usable Unit of Work and Required Outcome	Work Code*
c. Rehabilitate Runway *(Maintenance)*	**(1)** Maintenance is generally ineligible. However, per 49 USC § 47102(3)(H), the exception is routine runway, taxiway, or apron maintenance at nonhub primary airports and nonprimary airports. Paragraph 3-6 contains additional guidance and examples. **(2)** It is FAA policy that the sponsor must be unable to fund maintenance with its own resources. One way to satisfy this requirement is for the sponsor to submit a written certification to the ADO to this affect prior to the sponsor executing the grant. **(3)** The runway must be eligible and justified as a primary, crosswind, or secondary runway per the requirements in Paragraph G-2.	An operational runway.	RE RW IM
d. Rehabilitate Runway (*Seal Coat or Resealing of Joints in Concrete Pavement*)	**(1)** A major portion of the pavement is being addressed. **(2)** The ADO concurs with the need for the project. **(3)** The sponsor has satisfactorily complied with grant assurances on pavement maintenance. **(4)** The length and width of the pavement work must be based on critical aircraft justification per Paragraph 3-10. The exception is if the project meets the requirements in Paragraph 3-24 to exceed FAA design standards. **(5)** Paragraph 3-6 contains additional guidance (including useful life requirements) and examples that the ADO must use to differentiate between maintenance, rehabilitation, and reconstruction.	A fully functional runway with extended useful life.	RE RW IM

Table G-5 Runway Project Requirements

What Can Be Done If Justified	Factors to Consider For Justification and Eligibility	Required Usable Unit of Work and Required Outcome	Work Code*
	(6) The runway must be eligible and justified as a primary, crosswind, or secondary runway per the requirements in Paragraph G-2.		
e. Rehabilitate Runway *(Rehabilitate, Reconstruct)*	**(1)** The work must be supported a Pavement Condition Index (PCI) or planning study. The ADO has the option to consult AAS-100 for assistance with justifying pavement rehabilitation or reconstruction. **(2)** The length and width of the pavement work must be based on critical aircraft justification per Paragraph 3-10. The exception is if the project meets the requirements in Paragraph 3-24 to exceed FAA design standards. **(3)** Paragraph 3-6 contains additional guidance (including useful life requirements and that turf and aggregate runway rehabilitation is eligible) and examples that the ADO must use to differentiate between maintenance, rehabilitation, and reconstruction. **(4)** The pavement must not have been reconstructed within the last 20 years, rehabilitated within the last 10 years or resealed within the last 3 years except as allowed in Paragraph 3-12. **(5)** The project may include runway safety area improvements (stand-alone projects are also covered in this table) or other runway approach obstruction removal (stand-alone projects are covered in Appendix D). **(6)** Only in pavement runway lighting can be included in the rehabilitation project (as long as it meets the runway lighting requirements in Appendix J). Per APP-520 policy, all other runway	A fully functional runway with extended useful life.	RE RW IM

Table G-5 Runway Project Requirements

What Can Be Done If Justified	Factors to Consider For Justification and Eligibility	Required Usable Unit of Work and Required Outcome	Work Code*
	lighting must be separated into a stand-alone project. **(7)** The runway must be eligible and justified as a primary, crosswind, or secondary runway per the requirements in Paragraph G-2.		
f. Construct, Extend or Improve a Runway Safety Area *(For 14 CFR part 139 certificated runways only)*	**(1)** The project must be supported by a regional determination under the current version of FAA Order 5200.8, Runway Safety Area Program, to establish a safety area. **(2)** Engineered Material Arresting Systems (EMAS) must be supported by a runway safety area determination. **(3)** The only EMAS rehabilitation that is eligible is lid rehabilitation for EMAS installed with AIP funds prior to fiscal year 2007. This is because the EMAS installed before 2007 did not have the plastic lids. After fiscal year 2007, the manufacturer began fully encasing the blocks, which eliminated the need for lid replacement. **(4)** EMAS panels that were destroyed by an aircraft are eligible only if the sponsor can prove that there is no other avenue, such as insurance, for funding the replacement. **(5)** Where an airport is improving its RSA and existing FAA-owned equipment will be impacted by the airport's RSA project, it is FAA policy that the ADO may be able to include the relocation of the FAA-owned equipment as part of the AIP project. However, where the airport's RSA meets the RSA standards except for FAA-owned equipment, it is FAA policy that the Air Traffic Organization is responsible for relocating	A runway safety area that incorporates all of the improvements outlined in the regional determination.	SA RW SF

Table G-5 Runway Project Requirements

What Can Be Done If Justified	Factors to Consider For Justification and Eligibility	Required Usable Unit of Work and Required Outcome	Work Code*
	and/modifying the FAA-owned equipment in the RSAs. This policy is contained in the Relocation of FAA-owned Equipment from Runway Safety Areas jointly signed on July 31, 2012 by ARP-1 and AJO-0. **(6)** The runway must be eligible and justified as a primary, crosswind, or secondary runway per the requirements in Paragraph G-2.		
g. Construct, Extend or Improve a Runway Safety Area *(For runways that are not 14 CFR part 139 certificated)*	**(1)** The project must be supported by a regional determination under the current version of FAA Order 5200.8, Runway Safety Area Program, to establish a safety area. **(2)** Engineered Material Arresting Systems (EMAS) must be supported by a runway safety area determination. **(3)** The only EMAS rehabilitation that is eligible is lid rehabilitation (encasing the top of the blocks) for EMAS installed with AIP funds prior to fiscal year 2007. This is because the EMAS installed before 2007 did not have the plastic lids. After fiscal year 2007, the manufacturer began fully encasing the blocks, which eliminated the need for lid replacement. **(4)** EMAS panel replacement for panels that were destroyed by an aircraft is eligible if the sponsor has determined that there is no other avenue, such as insurance, for funding the replacement. **(5)** Where an airport is improving its RSA and existing FAA-owned equipment will be impacted by the airport's RSA project, it is FAA policy that the ADO may be able to include the relocation of the	A runway safety area that incorporates all of the improvements outlined in the regional determination.	ST RW SF

Table G-5 Runway Project Requirements

What Can Be Done If Justified	Factors to Consider For Justification and Eligibility	Required Usable Unit of Work and Required Outcome	Work Code*
	FAA-owned equipment as part of the AIP project. However, where the airport's RSA meets the RSA standards except for FAA-owned equipment, it is FAA policy that the Air Traffic Organization is responsible for relocating and/modifying the FAA-owned equipment in the RSAs. This policy is contained in the Relocation of FAA-owned Equipment from Runway Safety Areas jointly signed on July 31, 2012 by ARP-1 and AJO-0. **(6)** The runway must be eligible and justified as a primary, crosswind, or secondary runway per the requirements in Paragraph G-2.		
h. Runway Surface Condition Sensors	**(1)** The runway sensors must transit airfield conditions so that the timing of chemical applications may be determined. **(2)** The ADO must have concurred that the local weather conditions justify the need for the equipment. **(3)** The purpose is to ensure that aircraft can land and take off safely. Therefore, only runways are eligible for sensors. **(4)** Based on the current version of Advisory Circular 150/5200-30, Airport Field Condition Assessments and Winter Operations Safety, three or four sensors are normally sufficient for a runway. The ADO has the option to fund additional sensors if the ADO determines additional sensors are justified. **(5)** The runway surface condition sensor system is limited to a system that reports:	An operational system that successfully transmits runway conditions, indicates when chemical treatment must be applied, and meets FAA standards.	ST RW SR

Table G-5 Runway Project Requirements

What Can Be Done If Justified	Factors to Consider For Justification and Eligibility	Required Usable Unit of Work and Required Outcome	Work Code*
	(a) Runway surface temperature (actual temperature of pavement at the sampling site); **(b)** Presence or absence of moisture (dry pavement – no perceptible moisture, or wet pavement – perceptible moisture on surface); **(c)** Pre-ice conditions – advance alert of incipient ice formation prior to actual formation on the pavement; **(d)** Actual ice – visible or otherwise detectable ice on pavement; and **(e)** Ambient air temperature – at ground level in the vicinity of the runway. **(6)** The runway must be eligible and justified as a primary, crosswind, or secondary runway per the requirements in Paragraph G-2.		

*The current list of work codes can be obtained from the automated AIP system.

Appendix H. Taxiway Projects

H-1. How to Use This Appendix.

This appendix is not a valid stand-alone document for making eligibility and justification determinations. The information in this appendix must be used in conjunction with the Handbook, especially the project cost requirements in Chapter 3.

H-2. Taxiway Types (and Associated AIP Funding Rules).

AIP participation in a taxiway is limited to the requirements of the current version of Advisory Circular 150/5320-6, Airport Pavement Design and Evaluation, and the current version of Advisory Circular 150/5300-13, Airport Design. The common forms of taxiway pavements projects are listed below. For the purposes of this Handbook, the term *taxiway* refers to any of these types of projects so long as they are public-use.

a. Parallel and Partial Parallel Taxiway. A full length parallel taxiway connected to each end of a runway. If the runway is eligible and justified, then a parallel taxiway is eligible. A partial parallel taxiway is also eligible if the runway is eligible and justified and is normally considered at low activity airports where cost to construct the full length is excessive and the benefits do not warrant a full parallel taxiway.

b. Turnarounds. Turnarounds (also referred to as teacups) are small taxiways constructed at the end of a runway so that aircraft can change direction on the runway. A turnaround is eligible if the runway is eligible and justified. They are normally constructed at low activity airports when it is not economically feasible to construct a parallel or partial taxiway.

c. Holding Bays. Holding bays (also referred to as run-up pad and holding pads) are a paved area off the taxiway near the end of the runway where aircraft can conduct their final preflight activities or can wait for departure clearance or tower instruction. A holding bay is eligible if the runway is eligible and justified and the holding bay meets the justification requirements in the current version of Advisory Circular 150/5300-13, Airport Design.

d. Other Taxiways. A taxiway is a defined path for taxing of aircraft from one point to another. Taxiways on, or connecting to, aprons available for use by the general public are eligible.

e. Taxilanes. Taxilanes are used for access between taxiways and aircraft parking positions or buildings/hangars. They are outside the aircraft movement area controlled by the tower (if a towered airport). Public use taxilanes which serve multiple buildings are eligible using the same funding rules that apply to taxiways. A taxiway or taxilane that exclusively serves a hangar or building is considered part of the hangar or building (and the associated hangar or building eligibility and funding rules apply).

f. Converting Runways to Taxiways. A project to convert an ineligible runway to a taxiway will be eligible only if the ADO has determined that the taxiway is justified based on an operational need and the costs are reasonable to convert the pavement. Such projects must be identified on the airport layout plan and the pavement markings must be modified to meet FAA design standards.

H-3. Pavement Condition Index Requirements for Airfield Pavement Projects.

For an airfield pavement project, the ADO may justify pavement work based on the thresholds listed in Table H-1. The ADO has the option to fund pavement work outside of these thresholds if the ADO determines that the work is justified based on engineering analysis and the ADO obtains concurrence from AAS-100. The definitions (and eligibility restrictions by airport type) for reconstruction, rehabilitation, and maintenance are defined in Paragraph 3-6.

Table H-1. Pavement Condition Index Requirements for Airfield Pavement Projects

For the following type of airfield pavement project…	The pavement condition index (PCI) must be less than…
a. Reconstruction	55 (Poor)
b. Rehabilitation	70 (Fair)
c. Maintenance	N/A

H-4. Project Requirements Tables.

In addition to the information provided in the above paragraphs and the following tables, Appendix C contains examples of prohibited projects and costs and is very useful to use alongside this appendix.

Table H-2 Distinctions between Construct, Extend, Widen, Strengthen, Rehabilitate, Shift, and Remove

Use the following description…	If the project will…
a. Construct	Build a brand new taxiway.
b. Extend	Add additional length to a taxiway.
c. Widen	Increase the pavement width.
d. Strengthen	Will allow the pavement to accommodate a heavier class of aircraft.
e. Rehabilitate	Improves the pavement for the same class of aircraft.
f. Shift	Keep the same length, but move both ends of the taxiway.
g. Remove	Only remove pavement.

Table H-3 Taxiway Work Codes

If the project is justified as follows…	Use the following work codes…
a. The project meets the definition of a capacity project (see Appendix A).	CA TW CO (construct) CA TW EX (extend)
b. The project meets the definition of a standards project (see Appendix A).	ST TW CO (construct) ST TW CO (shift) ST TW CO (remove) ST TW IM (extend) ST TW IM (widen) ST TW IM (strengthen) RE TW IM (rehabilitate)
c. The project is justified in an environmental finding or 14 CFR part 150 program for environmental reasons. The project must be a condition of the environmental finding or 14 CFR part 150 program.	EN TW CO (construct)

Table H-4 Taxiway Project Requirements

What Can Be Done If Justified	Factors to Consider For Justification and Eligibility	Required Usable Unit of Work and Required Outcome	Work Code*
a. Taxiway (Construct, Extend, Widen, Strengthen, Shift)	**(1)** The taxiway must connect runways, taxiways, public-use aprons, or buildings eligible at that airport. **(2)** The length, width, and strength of the pavement work must be based on critical aircraft justification per Paragraph 3-11. The exception is if the project meets the requirements in Paragraph 3-24 to exceed FAA design standards. **(3)** Taxiway lighting may be included for the new taxiway pavement as long as it meets the taxiway lighting requirements in Appendix J. Per APP-520 policy, taxiway lighting for existing pavement must be separated into a stand-alone project. **(4)** The difference between construct, expand, modify, improve, rehabilitate, shift, and remove is listed in Table H-2. **(5)** Construction of parallel taxiways to support an approved Area Navigation (RNAV) approach is covered elsewhere in this table and has a different work code. **(6)** A taxiway or taxilane that exclusively serves a building is considered part of the building (and the associated building funding rules apply).	An operational taxiway constructed to FAA design standards, including required proper access, shoulders, turf along edge of shoulders, signs, taxiway safety areas, marking, and lighting.	CA TW CO CA TW EX EN TW CO ST TW CO ST TW IM See Table H-3 for the correct work code.
b. Install Infrastructure to support Area Navigation (RNAV) Approach *(Parallel Taxiway)*	**(1)** This is for a parallel taxiway required for an approved RNAV approach. **(2)** An approved RNAV approach is not sufficient justification for a parallel taxiway. The length, width, and strength of the pavement work must still be based on critical aircraft justification per Paragraph 3-11.	An operational taxiway constructed to FAA design standards, including required proper access, shoulders, turf along the edge of the shoulders, signs, marking, and taxiway lighting.	SP OT VI

Table H-4 Taxiway Project Requirements

What Can Be Done If Justified	Factors to Consider For Justification and Eligibility	Required Usable Unit of Work and Required Outcome	Work Code*
c. Rehabilitate Taxiway *(Maintenance)*	**(1)** Maintenance is generally ineligible. However, per 49 USC § 47102(3)(H), the exception is routine runway, taxiway, or apron maintenance at nonhub primary airports and nonprimary airports. Paragraph 3-6 contains additional guidance and examples. **(2)** It is FAA policy that the sponsor must be unable to fund maintenance with its own resources. **(3)** The taxiway must connect runways, taxiways, public-use aprons, or buildings eligible at that airport. **(4)** A taxiway or taxilane that exclusively serves a building is considered part of the building (and the associated building funding rules apply).	An operational taxiway.	RE TW IM

Table H-4 Taxiway Project Requirements

What Can Be Done If Justified	Factors to Consider For Justification and Eligibility	Required Usable Unit of Work and Required Outcome	Work Code*
d. Rehabilitate Taxiway (Seal Coat or Resealing of Joints in Concrete Pavement)	**(1)** A major portion of the pavement is being addressed. **(2)** The ADO concurs with the need for the project. **(3)** The sponsor has satisfactorily complied with grant assurances on pavement maintenance. **(4)** The length and width of the pavement work must be based on critical aircraft justification per Paragraph 3-103-11. The exception is if the project meets the requirements in Paragraph 3-24 to exceed FAA design standards. **(5)** Paragraph 3-6 contains additional guidance (including useful life requirements) and examples that the ADO must use to differentiate between maintenance, rehabilitation, and reconstruction. **(6)** The taxiway must connect runways, taxiways, public-use aprons, or buildings eligible at that airport. **(7)** A taxiway or taxilane that exclusively serves a building is considered part of the building (and the associated building funding rules apply).	A fully functional taxiway with extended useful life.	RE TW IM

Table H-4 Taxiway Project Requirements

What Can Be Done If Justified	Factors to Consider For Justification and Eligibility	Required Usable Unit of Work and Required Outcome	Work Code*
e. Rehabilitate Taxiway (Rehabilitate or Reconstruct)	**(1)** The work must be supported a Pavement Condition Index (PCI) or planning study. The ADO has the option to consult AAS-100 for assistance with justifying pavement rehabilitation or reconstruction. **(2)** The length and width of the pavement work must be based on critical aircraft justification per Paragraph 3-11. The exception is if the project meets the requirements in Paragraph 3-24 to exceed FAA design standards. **(3)** Paragraph 3-6 contains additional guidance (including useful life requirements) and examples that the ADO must use to differentiate between maintenance, rehabilitation, and reconstruction. **(4)** The pavement must not have been reconstructed within the last 20 years, rehabilitated within the last 10 years or resealed within the last 3 years except as allowed in Paragraph 3-12. **(5)** The taxiway must connect runways, taxiways, public-use aprons, or buildings eligible at that airport. **(6)** Only in-pavement taxiway lighting can be included in the rehabilitation project (as long as it meets the taxiway lighting requirements in Appendix J). Per APP-520 policy, all other taxiway lighting must be separated into a stand-alone project. **(7)** A taxiway or taxilane that exclusively serves a building is considered part of the building (and the associated building funding rules apply).	A fully functional taxiway with extended useful life.	RE TW IM

*The official list of work codes can be obtained from the automated AIP system.

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Appendix I. Apron Projects

I-1. How to Use This Appendix.

This appendix is not a valid stand-alone document for making eligibility and justification determinations. The information in this appendix must be used in conjunction with the Handbook, especially the project cost requirements in Chapter 3.

I-2. Non-Exclusive Use Available for Public Aircraft Parking/Access.

Apron pavement is only eligible if it will be used for aircraft parking or as a compass calibration pad and is not exclusive use (see Appendix A for a definition and references on exclusive use). A good rule of thumb is that the flying public must be able to park on the pavement in order for it to be considered eligible apron area.

The portion of the apron project that will be used for support areas, such as service vehicle parking and fixed based operator equipment storage, is not eligible.

I-3. Apron in Front of a Building.

For apron pavement immediately in front of a building, per FAA policy, the 50 feet of pavement in front of the building is considered part of that building (and the associated building eligibility and funding building apply). The rest of the apron pavement in front of a building is only eligible as apron work if is available for public aircraft parking and is not exclusive use.

I-4. Pavement Condition Index Requirements for Airfield Pavement Projects.

For an airfield pavement project, the ADO may justify pavement work based on the thresholds listed in Table I-1. The ADO has the option to fund pavement work outside of these thresholds if the ADO determines that the work is justified based on engineering analysis and the ADO obtains concurrence from AAS-100. The definitions (and eligibility restrictions by airport type) for reconstruction, rehabilitation, and maintenance are defined in Paragraph 3-6.

Table I-1 Pavement Condition Index Requirements for Airfield Pavement Projects

For the following type of airfield pavement project…	The pavement condition index (PCI) must be less than…
a. Reconstruction	55 (Poor)
b. Rehabilitation	70 (Fair)
c. Seal Coat or Resealing of Joints in Concrete Pavement	N/A

Table I-1 Pavement Condition Index Requirements for Airfield Pavement Projects

For the following type of airfield pavement project…	The pavement condition index (PCI) must be less than…
d. Maintenance	N/A

I-5. Project Requirements Tables.

In addition to the information provided in the above paragraphs and the following tables, Appendix C contains examples of prohibited projects and costs and is very useful to use alongside this appendix.

Table I-2 Distinctions between Construct, Expand, Strengthen, and Rehabilitate

Use the following description…	If the project will…
a. Construct	Build a brand new apron.
b. Extend	Add additional area to an apron.
c. Widen	Add additional area to an apron by widening the apron.
d. Strengthen	Will allow the pavement to accommodate a heavier class of aircraft.
e. Rehabilitate	Improves the pavement for the same class of aircraft.

Table I-3 Apron Work Codes

If the project is justified as follows…	Use the following work codes…
a. The project meets the definition of a capacity project (see Appendix A).	CA AP CO (construct) CA AP EX (expand)
b. The project meets the definition of a standards project (see Appendix A).	ST AP CO (construct) ST AP IM (expand) ST AP IM (strengthen) RE AP IM (rehabilitate)

Table I-3 Apron Work Codes

If the project is justified as follows…	Use the following work codes…
c. The project is justified in an environmental finding or 14 CFR part 150 program for environmental reasons. The project must be a condition of the environmental finding or 14 CFR part 150 program.	EN AP CO (construct)

Table I-4 Apron Project Requirements

What Can Be Done If Justified	Factors to Consider For Justification and Eligibility	Required Usable Unit of Work and Required Outcome	Work Code*
a. Apron (Construct, Expand, Strengthen)	**(1)** The project cannot include pavement for auto parking or other non-aeronautical uses. **(2)** The project cannot include pavement for exclusive use areas (must be open to the public to park their aircraft). **(3)** Cargo aprons are limited use and the public is not allowed to freely use the apron. However, apron for freight or cargo activity is eligible if the opportunity to compete for use of the apron is available.	An operational apron constructed to FAA design standards, including required proper access, shoulders, turf along edge of shoulders, signs, marking, and lighting.	CA AP CO CA AP EX ST AP CO ST AP IM EN AP CO See Table I-3 for the correct work code.

Table I-4 Apron Project Requirements

What Can Be Done If Justified	Factors to Consider For Justification and Eligibility	Required Usable Unit of Work and Required Outcome	Work Code*
b. Rehabilitate Apron (Maintenance)	**(1)** The project cannot include pavement for auto parking or other non-aeronautical uses. **(2)** The project cannot include pavement for exclusive use areas (must be open to the public to park their aircraft). **(3)** Maintenance is generally ineligible. However, per 49 USC § 47102(3)(H), the exception is routine runway, taxiway, or apron maintenance at nonhub primary airports and nonprimary airports. Paragraph 3-6 contains additional guidance and examples. **(4)** It is FAA policy that the sponsor must be unable to fund maintenance with its own resources.	An operational apron.	RE AP IM

Table I-4 Apron Project Requirements

What Can Be Done If Justified	Factors to Consider For Justification and Eligibility	Required Usable Unit of Work and Required Outcome	Work Code*
c. Rehabilitate Apron (Seal Coat or Resealing of Joints in Concrete Pavement)	**(1)** A major portion of the pavement is being addressed. **(2)** The ADO concurs with the need for the project. **(3)** The sponsor has satisfactorily complied with grant assurances on pavement maintenance. **(4)** The project must not include pavement for auto parking or other non-aeronautical uses. **(5)** The project must not include pavement for exclusive use areas (must be open to the public to park their aircraft). **(6)** The length and width of the pavement work must be based on critical aircraft justification per Paragraph 3-11. The exception is if the project meets the requirements in Paragraph 3-24 to exceed FAA design standards. **(7)** Paragraph 3-6 contains additional guidance (including useful life requirements) and examples that the ADO must use to differentiate between maintenance, rehabilitation, and reconstruction.	A fully functional apron with extended useful life.	RE AP IM

Table I-4 Apron Project Requirements

What Can Be Done If Justified	Factors to Consider For Justification and Eligibility	Required Usable Unit of Work and Required Outcome	Work Code*
d. Rehabilitate Apron (Rehabilitate or Reconstruct)	**(1)** The project must not include pavement for auto parking or other non-aeronautical uses. **(2)** The project must not include pavement for exclusive use areas (must be open to the public to park their aircraft). **(3)** The work must be supported a Pavement Condition Index (PCI) or planning study. The ADO has the option to consult AAS-100 for assistance with justifying pavement rehabilitation or reconstruction. **(4)** The length and width of the pavement work must be based on critical aircraft justification per Paragraph 3-11. The exception is if the project meets the requirements in Paragraph 3-24 to exceed FAA design standards. **(5)** Paragraph 3-6 contains additional guidance (including useful life requirements) and examples that the ADO must use to differentiate between maintenance, rehabilitation, and reconstruction. **(6)** The pavement must not have been reconstructed within the last 20 years, rehabilitated within the last 10 years or resealed within the last 3 years except as allowed in Paragraph 3-12.	A fully functional apron with extended useful life.	RE AP IM

*The official list of work codes can be obtained from the automated AIP system.

Appendix J. Airfield Marking, Signage, and Lighting Projects

J-1. How to Use This Appendix.

This appendix is not a valid stand-alone document for making eligibility and justification determinations. The information in this appendix must be used in conjunction with the Handbook, especially the project cost requirements in Chapter 3.

J-2. Eligibility of Pavement Marking as a Stand-Alone Project.

The eligibility of pavement markings as a stand-alone project depends on the airport type as shown in Table J-1.

Table J-1 Eligibility of Stand Alone-Projects for New and Faded Marking

For the following airport types…	Stand-alone projects for new or faded marking are…
a. Large, medium, and small hub	**Not Allowed.** This includes new marking due to a change in magnetic variation. In addition, the replacement of faded markings is not eligible (considered maintenance) because 14 CFR part 139.311 includes replacing faded or inaccurate markings as a maintenance activity at an airport.
b. Nonhub primary and nonprimary	**Allowed.** The project must be coded as runway, taxiway, or apron rehabilitation (maintenance).

J-3. Eligibility of Sign Panel Replacement as a Stand-Alone Project.

The eligibility of sign panel replacement as a stand-alone project is included in Table J-2.

Table J-2 Eligibility of Stand-Alone Projects for Sign Panel Replacement

For the following situation…	Stand-alone projects for sign panel replacement are…
a. Replacement of sign panels due to a runway designation change based on magnetic variation as required by the current version of FAA Order 8260.19, Flight Procedures and Airspace.	**Eligible.** Note that the requirements in the current version of Advisory Circular 150-5340-1 are not sufficient justification for this type of project. The designation change must be required by the current version of FAA Order 8260.19, Flight Procedures and Airspace. The correct code for this project is that of a signage project under Table J-4. Also, since this may be a small grant, the ADO must ensure that the minimum grant amount requirement in Paragraph 5-20 are be met.
b. Replacement of sign panels required by a change in airfield geometry or new sign panel specifications.	**Eligible.** Since this may be a small stand-alone grant, the ADO must ensure that the minimum grant amount requirement in Paragraph 5-20 are be met. The correct code for this project is that of a signage project under Table J-4. If the project is being done concurrently with an associated AIP funded runway, taxiway, or apron project, the costs can be include and coded under the runway, taxiway, or apron project.
c. Replacement of faded sign panels associated with an AIP funded runway, taxiway, or apron project.	**Not Eligible (but can be funded as an allowable cost).** The cost to replace faded sign panels is considered to be incidental allowable costs if it is included in the grant for the runway, taxiway, or apron project. In this case, the ADO must include the costs under the project code for the runway, taxiway, or apron project.
d. Replacement of faded sign panels.	**Not Eligible.** Stand-alone projects to replace faded sign panels are considered a maintenance activity.

J-4. Airport Lighting Control Panel Modification.

Airfield lighting projects may include modification of the airport lighting control panel in the air traffic control tower to accommodate the changes to the airfield lighting. The panel modification is considered a noncompetitive proposal must follow the additional requirements that are located in Paragraphs 3-36 and U-18.

J-5. Certified Lighting Equipment for which there is Only a Single Manufacturer.

Airfield lighting projects may include acquisition of certified airfield lighting equipment for which there is only a single manufacturer. The procurement of this equipment is considered a noncompetitive proposal and must follow the additional requirements that are found in Paragraphs 3-36 and U-18.

J-6. Lighting for Pavement that Exceeds FAA Design Standards.

For pavements that exceed FAA design standards width, the ADO must not fund installation of edge lighting to the extra width unless the sponsor agrees that it will not seek pavement rehabilitation funds for 10 years (which is the useful life of a lighting project). The sponsor must also agree that if pavement rehabilitation is needed within the 10 year period, the pavement will be rehabilitated to the FAA design standards width and the cost of removing and replacing the airfield lighting to the corrected width will be funded with non-AIP funds. The ADO must include a special condition in the associated grant outlining this requirement. The automated AIP system contains the current available special conditions.

J-7. Project Requirements Table.

In addition to the information provided in the above paragraphs and the following table, Appendix C contains examples of prohibited projects and costs and is very useful to use alongside this appendix.

Table J-3 Airfield Marking, Signage, and Lighting Work Codes

If the project is justified as follows…	Use the following work codes…
a. The project is one of the special emphasis items listed in 49 CFR § 47101(f) for a primary or secondary runway or taxiway at a commercial service airport.	**SP** XX XX
b. The project meets all of the associated eligibility requirements for that type of project *and* is needed to satisfy a safety issue identified by a 14 CFR part 139 violation, be identified by a 14 CFR part 139 certification inspector as needed runway incursion prevention measure, or a Runway Safety Action Team (RSAT) recommendation. The ADO must review the project to verify that it is eligible. For instance, runway marking is not eligible at a small hub airport and a 14 CFR part 139 violation does not make it eligible.	**SA** XX XX
c. The project is required to meet current FAA design standards in accordance with applicable advisory circulars and does not meet the above two sets of criteria.	**ST** XX XX

Table J-4 Airfield Signage and Lighting Project Requirements

What Can Be Done If Justified	Factors to Consider For Justification and Eligibility	Required Usable Unit of Work and Required Outcome	Work Code*
a. Install Guidance Signs	**(1)** If the airport is a 14 CFR part 139 certificated airport, the sponsor must have included the proposed signs in the sign plan, and the FAA must have reviewed and accepted the airport sign plan. For non-certificated airports, the 14 CFR part 139 certification inspector and/or the ADO have the option to impose this same requirement. **(2)** Lighted guidance signs must be supported by night or instrument approach operations. **(3)** The associated pavement must be AIP eligible and justified.	Fully functional guidance signs that meets FAA standards.	SP OT SG SA OT SG ST OT SG See Table J-3 for the correct work code.

Table J-4 Airfield Signage and Lighting Project Requirements

What Can Be Done If Justified	Factors to Consider For Justification and Eligibility	Required Usable Unit of Work and Required Outcome	Work Code*
b. Install Runway Lighting	**(1)** Installation of runway lighting may include modifications of the airfield electrical vault as part of the overall project. **(2)** The lighting must be supported by night or instrument approach operations. **(3)** Per APP-520 policy, taxiway and/or apron lighting must not be included in the runway lighting project. These projects must be separated into stand-alone projects. **(4)** For centerline lights, the runway must meet at least one of the following criteria: **(a)** Landing operations below 2,400 feet runway visual range ; **(b)** Used by aircraft with approach speeds exceeding 140 knots or if the runway has a width greater than 170 feet; or **(c)** Takeoff operations below 1,600 feet RVR. **(5)** Touchdown zone lights are considered an integral part of a centerline lighting system. **(6)** The associated pavement must be AIP eligible and justified.	A fully functional runway lighting system that meets FAA standards.	SP RW LI SA RW LI ST RW LI See Table J-3 for the correct work code.

Table J-4 Airfield Signage and Lighting Project Requirements

What Can Be Done If Justified	Factors to Consider For Justification and Eligibility	Required Usable Unit of Work and Required Outcome	Work Code*
c. Rehabilitate Runway Lighting	**(1)** Rehabilitation of runway lights may include replacing a significant number of fixture lenses, transformers, and cabling. The main light base and conduit will normally remain in place. **(2)** If new light bases and fixtures are installed for a major part of the runway, the project is no longer considered rehabilitation, and the appropriate install work code must be used instead. **(3)** The lighting must be supported by night or instrument approach operations. **(4)** Per APP-520 policy, taxiway and/or apron lighting must not be included in the runway lighting project. These projects must be separated into stand-alone projects. **(5)** The rehabilitation must be supported by analysis demonstrating a need for rehabilitation and that rehabilitation will result in the useful life being extended by at least five years. **(6)** The associated pavement must be AIP eligible and justified.	A fully functional runway lighting system that meets FAA standards.	RE RW LI

Table J-4 Airfield Signage and Lighting Project Requirements

What Can Be Done If Justified	Factors to Consider For Justification and Eligibility	Required Usable Unit of Work and Required Outcome	Work Code*
d. Install Land and Hold Short Lights	**(1)** Justification for land and hold short (LAHSO) lights requires an approved LAHSO plan per the current version of FAA Order 7110.118, Land and Hold Short Operations. **(2)** The associated pavement must be AIP eligible and justified.	A runway lighting system that allows LAHSO at the airport.	SP RW LI SA RW LI ST RW LI See Table J-3 for the correct work code.
e. Install Runway Distance-To-Go Signs	**(1)** Per FAA policy, the runway must have turbojet aircraft operations. **(2)** These signs are also called distance remaining signs. **(3)** This would only rarely be a stand-alone grant. The ADO can only allow this as a stand-alone grant if an airport begins having turbojet operations. **(4)** Lighted signs must be supported by night or instrument approach operations. **(5)** The associated pavement must be AIP eligible and justified.	A fully functional set of distance-to-go signs that meet FAA standards.	SP RW SG

Table J-4 Airfield Signage and Lighting Project Requirements

What Can Be Done If Justified	Factors to Consider For Justification and Eligibility	Required Usable Unit of Work and Required Outcome	Work Code*
f. Improve Airport Miscellaneous Improvements (Install/Rehabilitate Airfield Lighting Vault)	**(1)** The vault must serve eligible airfield lighting. **(2)** Rehabilitation of a vault must include replacement of major equipment such as the regulators. **(3)** Rehabilitation must be supported by analysis demonstrating a need for rehabilitation and that rehabilitation will result in the useful life being extended by at least five years. **(4)** The vault work may be coded under another project if it is required by the other project and is done as part of that project (such as runway lighting rehabilitation that requires an upgrade to the vault). **(5)** The associated pavement must be AIP eligible and justified.	A fully functional vault that meets FAA standards.	ST OT IM
g. Install Taxiway Edge Lighting	**(1)** Taxiway lighting is only justified for taxiways that are associated with lighted runways. **(2)** Reflectors are eligible in lieu of taxiway edge lights. **(3)** The associated pavement must be AIP eligible and justified.	A fully functional taxiway lighting system that meets FAA standards.	SP TW LI SA TW LI ST TW LI See Table J-3 for the correct work code.

Table J-4 Airfield Signage and Lighting Project Requirements

What Can Be Done If Justified	Factors to Consider For Justification and Eligibility	Required Usable Unit of Work and Required Outcome	Work Code*
h. Install Taxiway Centerline Lighting	**(1)** Taxiway centerline lighting is only justified for taxiways that are associated with runways that have centerline lighting. **(2)** One of the following conditions must be met: **(a)** The taxiway connects to a Category II or III runway. **(b)** The lighting is a Runway Safety Action Team recommendation. The ADO must review RSAT recommendations on a case by case basis to determine if they are eligible and justified. **(3)** The associated pavement must be AIP eligible and justified.	A fully functional taxiway lighting system that meets FAA standards.	SP TW LI SA TW LI ST TW LI See Table J-3 for the correct work code.

Table J-4 Airfield Signage and Lighting Project Requirements

What Can Be Done If Justified	Factors to Consider For Justification and Eligibility	Required Usable Unit of Work and Required Outcome	Work Code*
i. Rehabilitate Taxiway Lighting	**(1)** Taxiway lighting is only justified for taxiways that are associated with lighted runways. Taxiway centerline lighting is only justified for taxiways that are associated with runways that have centerline lighting. **(2)** Rehabilitation of taxiway lights may include replacing a significant number of fixture lenses, transformers, and cabling. The main light base and conduit will normally remain in place. **(3)** If new light bases and fixtures are installed for a major part of the taxiway, the project is no longer considered rehabilitation, and the appropriate install work code must be used instead. **(4)** The rehabilitation must be supported by analysis demonstrating a need for rehabilitation and that rehabilitation will result in the useful life being extended by at least five years. **(5)** The associated pavement must be AIP eligible and justified.	A fully functional taxiway lighting system that meets FAA standards.	RE TW LI

Table J-4 Airfield Signage and Lighting Project Requirements

What Can Be Done If Justified	Factors to Consider For Justification and Eligibility	Required Usable Unit of Work and Required Outcome	Work Code*
j. Install Runway Incursion Lighting *(Including Lighted X's)*	**(1)** Runway incursion lighting may include lighted X's, runway status lights, runway guard lights, clearance bars, and/or stop bars. Lighted X's may also be purchased. **(2)** The sponsor cannot transfer the ownership and maintenance of these systems to the FAA Air Traffic Organization (ATO). **(3)** Except for lighted X's, the project must be identified as a safety issue by a 14 CFR part 139 certification inspector or in a Runway Safety Action Team recommendation. The ADO must review RSAT recommendations on a case by case basis to determine if they are eligible and justified. **(4)** The associated pavement must be AIP eligible and justified.	A fully functional runway incursion lighting system or a lighted X that meets FAA standards.	SA OT SG
k. Install Runway Incursion Marking	**(1)** This is also referred to as enhanced taxiway centerline marking. **(2)** Runway incursion markings cannot be applied to select airfield locations. They must be applied to every runway holding position on the airport. **(3)** The associated pavement must be AIP eligible and justified.	A set of runway incursion markings that meets FAA standards and are applied to all runway holding positions on the airport.	SA OT SG (14 CFR part 139) SP OT SG (non 14 CFR part 139 Commercial Service)

Table J-4 Airfield Signage and Lighting Project Requirements

What Can Be Done If Justified	Factors to Consider For Justification and Eligibility	Required Usable Unit of Work and Required Outcome	Work Code*
l. Install Surface Movement Guidance and Control System (SMGCS) Lighting	**(1)** SMGCS lighting may include runway guard lights, clearance bars, and/or stop bars. **(2)** The airport must have an FAA approved SMGCS plan. **(3)** The associated pavement must be AIP eligible and justified.	A complete SMGCS lighting pattern that allows aircraft to taxi from a Category II/ III runway to the apron.	SP OT SG
m. Install Apron Edge Lights	**(1)** The apron must be eligible.	An apron with edge lights that meet FAA standards.	ST AP LI
n. Install Apron Flood Lighting	**(1)** The added lighting must not cause an adverse effect on airport operations. **(2)** Apron flood lighting must be free standing. Lighting that is attached to a building is coded as the building, not the apron. **(3)** Although apron lighting may be a recommendation from TSA, a TSA letter is not mandatory. **(4)** The associated pavement must be AIP eligible and justified.	An illuminated apron area.	ST OT LI

Table J-4 Airfield Signage and Lighting Project Requirements

What Can Be Done If Justified	Factors to Consider For Justification and Eligibility	Required Usable Unit of Work and Required Outcome	Work Code*
o. Install Terminal Gate Position Lead-In Lights	**(1)** The ADO must coordinate the project with AAS-100 to ensure the added lighting will not cause confusion for aircraft operations. **(2)** Gate position lead-in lighting must be free standing. Lighting that is attached to a building is coded as the building, not the apron. **(3)** The associated terminal gate must not be exclusive use.	An operational lead in system to an eligible gate.	ST OT LI

*The official list of work codes can be obtained from the automated AIP system.

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Appendix K. Navigational Aid (NAVAID) and Weather Reporting Equipment Projects

K-1. How to Use This Appendix.

This appendix is not a valid stand-alone document for making eligibility and justification determinations. The information in this appendix must be used in conjunction with the Handbook, especially the project cost requirements in Chapter 3.

K-2. Installation of Instrument Landing Systems (ILS).

The FAA Air Traffic Organization (ATO) is transitioning to Performance Based Navigation (PBN) approaches, as enabled by satellite navigation, rather than adding new ILS ground based equipment to the National Airspace System. These GPS approaches using Area Navigation (RNAV) provide equivalent instrument approach capability as ground based equipment can for Category I approaches.

On December 15, 2011, the FAA announced in 76 Federal Register 77939 that "In order to maximize operational benefits and take advantage of the cost savings associated with WAAS, the FAA no longer intends to establish new Category I ILSs using Facilities and Equipment (F&E) funding."

In the same notice, the FAA announced consideration of "…programmatic changes under AIP that would favor WAAS for new precision approaches at airports, rather than ILS." Consistent with the notice, the FAA policy is that AIP funds must not be used to install a new Instrument Landing System (ILS) where the FAA has determined that an RNAV approach can provide similar capabilities. Therefore, where the ATO has determined that an RNAV approach cannot be implemented on a new or extended runway, and APP-500 has determined that the ILS installation is justified, the installation of a ground-based ILS installation is allowable with AIP. In accordance with the FAA Office of Airports and the Air Traffic Organization written agreement, the ADO must not program a new ILS on an existing runway.

Appendix Z summarizes the contents of ILS policy of the Offices of Airports and Air Traffic Control.

K-3. Transfer of Equipment to the FAA Air Traffic Organization (ATO).

Under 49 USC § 44502(e), an airport may transfer an instrument landing system (and associated approach lighting equipment and runway visual range equipment) to ATO if funded with AIP and the applicable FAA standards have been met. However, because the FAA is transitioning away from installing new ground based ILS, by FAA policy, installation of an ILS that is planned for ATO takeover must be approved in advance by APP-1.

Except for the specific statutory exception that allows a full ILS to be transferred to the ATO for ownership and maintenance, all NAVAIDs and signs installed under AIP will be owned and operated by the airport.

K-4. Required FAA Air Traffic Organization (ATO) Coordination.

If the project impacts or involves the relocation of an FAA-owned NAVAID, the ADO must complete all required coordination with FAA Technical Operations (AJW).

K-5. Designated Instrument Runway Requirement.

Airport approach and landing systems are not eligible unless the FAA Air Traffic Organization (ATO) has designated the associated runway as an instrument runway. The ATO designation considers safety requirements, relevant meteorological history, NAS-wide capacity, delays at individual airports, aviation activity forecasts, changes in the airfield and operational environment (including relocation of existing systems), as well as overall airport capital improvement costs regardless of the funding source.

Only airport rotating beacons, runway end identification light systems, and visual glide-slope indicator systems are eligible at airports without a designated instrument runway.

K-6. NAVAID and Weather Reporting Equipment Communication Requirements.

All NAVAID and weather reporting equipment must directly communicate with pilots, rather than directly communicate with the air traffic control tower, in order to be considered eligible. This is because equipment that communicates with the air traffic control tower is funded through the FAA Air Traffic Organization (ATO)'s budget.

K-7. Compass Calibration Pad.

A compass calibration pad is normally planned and constructed with adjacent taxiway or apron pavements. A compass calibration pad is not normally a stand-alone project. If the ADO determines that a stand-alone project is appropriate, the project is coded as an apron project rather than a NAVAID.

K-8. Airside Service Roads to Access AIP Eligible NAVAIDs.

The ADO has the option to fund an airside service road for access to an AIP eligible NAVAID. However, note that service roads are not eligible for pavement maintenance under AIP (only *runway, taxiway, and apron* pavement maintenance at certain airports is eligible).

K-9. Project Requirements Table.

In addition to the information provided in the above paragraphs and the following table, Appendix C contains examples of prohibited projects and costs and is very useful to use alongside this appendix.

Table K-1 NAVAID and Weather Reporting Equipment Work Codes

If the project is justified as follows…	Use the following work codes…
a. The project is for a primary or secondary runway or taxiway at a commercial service airport.	**SP** XX XX
b. The project is needed to satisfy a safety issue identified by a 14 CFR part 139 violation or a Runway Safety Action Team (RSAT) recommendation. The ADO must review RSAT recommendations on a case by case basis to determine if they are eligible and justified.	**SA** XX XX
c. The project is required to meet current FAA design standards in accordance with applicable advisory circulars and does not meeting the above to sets of criteria.	**ST** XX XX

Table K-2 NAVAID and Weather Reporting Equipment Project Requirements

What Can Be Done If Justified	Factors to Consider For Justification and Eligibility	Required Usable Unit of Work and Required Outcome	Work Code*
a. Install Instrument Approach Aid *(Instrument Landing System)*	**(1)** The ADO must not program a ground-based ILS without specific written APP-1 approval. The guidance for funding an ILS can be found in Paragraph K-2. **(2)** The ADO must not program a ground-based ILS unless the ADO has received written notification from the FAA Air Traffic Organization (ATO) that the ATO has determined that an Area Navigation (RNAV) approach is not suitable for a given location (e.g., ILS is needed to maintain efficiency with merging and spacing, approach transition guidance, or substantially better minima). **(3)** An ILS will not necessarily include installing an Approach Lighting System, which must be separately justified. Per APP-500 policy, an ALS is not justified for AIP funding unless the airport will have a reduction in minimums of at least ¼ mile and records 300 or more annual	A fully functional ILS that meets FAA standards.	ST RW IN

Table K-2 NAVAID and Weather Reporting Equipment Project Requirements

What Can Be Done If Justified	Factors to Consider For Justification and Eligibility	Required Usable Unit of Work and Required Outcome	Work Code*
	instrument approaches to the runway. **(4)** The project must be designed to meet the requirements in the current version of Advisory Circular 150/5300-13, Airport Design, and the requirements in the ATO reimbursable agreement. **(5)** Unless the ADO has received APP-1 approval per (1), and ATO notification that an RNAV approach is not suitable per (2), then of the following must be met: **(a)** The airport must be a large, medium, or small hub primary airport. **(b)** The ILS is for a new or extended runway. **(c)** The ILS will provide Category II or III minimums. **(6)** APP-500 has conducted a benefit-cost analysis that resulted in a benefit-cost ratio of 1.0 or more.		
b. Install Instrument Approach Aid *(Runway Visual Range (RVR))*	**(1)** The FAA Air Traffic Organization (ATO) must have designated the runway as an instrument runway. **(2)** The visibility information is made available directly to pilots. **(3)** Per FAA policy, the ADO can program an RVR at a nonprimary airport using nonprimary entitlement funds only. **(4)** Per FAA policy, the ADO can only program an RVR at an airport that has a published instrument flight procedure that has published RVR minimums. **(5)** The airport cannot transfer ownership of AIP-funded RVR	A fully functional RVR that meets FAA design standards.	ST RW IN

Table K-2 NAVAID and Weather Reporting Equipment Project Requirements

What Can Be Done If Justified	Factors to Consider For Justification and Eligibility	Required Usable Unit of Work and Required Outcome	Work Code*
	equipment to the ATO unless it will be associated with an ILS that is being installed in the same project. **(6)** ADOs must contact APP-500 for assistance with proposed RVR projects.		
c. Install Miscellaneous NAVAIDs *(Airport Beacon)*	**(1)** The airport rotating beacon equipment must be necessary for visual approaches to the airfield at night. **(2)** The airport must be open at night and must have runway lights in order to have a justified beacon.	A fully functional airport beacon that meets FAA design standards.	SP OT IN ST OT IN See Table K-1 for the correct work code.
d. Install Miscellaneous NAVAIDs (*Wind Cone)*	**(1)** The airport must be open at night and must have runway lights in order to justify a lighted wind cone.	A fully functional wind cone that meets FAA standards.	SP OT IN ST OT IN See Table K-1 for the correct work code.
e. Install Miscellaneous NAVAIDs (*Segmented Circle)*	**(1)** Where warranted, segmented circles used for landing direction, traffic pattern indicators or right turn indicators are allowed.	A fully functional segmented circle that meets FAA standards.	SP OT IN ST OT IN See Table K-1 for the correct work code.
f. Install Runway Vertical/Visual Guidance System *(Approach Light System (ALS))*	**(1)** The FAA Air Traffic Organization (ATO) must have designated the runway as an instrument runway. **(2)** Per APP-500 policy, an ALS is not justified for AIP funding unless the airport will have a reduction in minimums of at least ¼ mile. **(3)** APP-500 has conducted a benefit-cost analysis that resulted in a benefit-cost ratio of 1.0 or more.	A complete ALS installation with clear approaches that reduces the minimums and meets FAA standards.	SP RW VI ST RW VI See Table K-1 for the correct work code.

Table K-2 NAVAID and Weather Reporting Equipment Project Requirements

What Can Be Done If Justified	Factors to Consider For Justification and Eligibility	Required Usable Unit of Work and Required Outcome	Work Code*
	(4) The sponsor cannot transfer the ownership and maintenance of these systems to ATO unless installed as part of a complete ILS that includes an ALS. **(5)** An ALS is only eligible on a runway that either has a precision approach procedure published instrument flight procedure and 300 or more recorded annual instrument approaches or is forecast to have a published instrument flight procedure and 300 or more recorded annual instrument approaches within five years. **(6)** Eligible ALSs include: **(a)** Approach Lighting System (ALS). **(b)** Approach Lighting System with Sequenced Flashing Lights (ALSF). **(c)** Medium-Intensity Approach Light System and Runway Alignment Indicator Lights (MALSR). **(d)** Medium-Intensity Approach Light System without Runway Alignment Indicator Lights (MALS). This is rare and requires additional justification because Runway Alignment Indicator Lights are an integral part of most ALS installations. **(e)** Medium-Intensity Approach Lights System with Sequenced Flashing Lights (MALSF).		
g. Install Runway Vertical/Visual Guidance System (Omni-Directional	**(1)** The FAA Air Traffic Organization (ATO) must have designated the runway as an instrument runway. **(2)** The ODALS must result in a reduction of minimums of at least ¼ mile.	A complete ODALS installation with clear approaches that reduces the minimums and	SP RW VI ST RW VI See Table K-1 for the

Table K-2 NAVAID and Weather Reporting Equipment Project Requirements

What Can Be Done If Justified	Factors to Consider For Justification and Eligibility	Required Usable Unit of Work and Required Outcome	Work Code*
Approach Lighting System (ODALS))	**(3)** An ODALS is only eligible on a runway that either has a published instrument flight procedure and 300 or more recorded annual instrument approaches or is forecast to have a published instrument flight procedure and 300 or more recorded annual instrument approaches within five years. **(4)** APP-500 has conducted a benefit-cost analysis that resulted in a benefit-cost ratio of 1.0 or more. **(5)** The airport cannot transfer the ownership of these systems to the ATO.	meets FAA standards.	correct work code.
h. Install Runway Vertical/Visual Guidance System *(Runway End Identification Light System (REILS))*	**(1)** This project will provide visual guidance on runways that are not equipped with an approach light system. **(2)** Per FAA policy, the ADO can fund REILs at a nonprimary airport only if the REILS are funded using nonprimary entitlement funds only. **(3)** The airport cannot transfer the ownership of these systems to the FAA Air Traffic Organization (ATO).	A fully functional REILS that meet FAA standards.	SP RW VI ST RW VI See Table K-1 for the correct work code.
i. Install Runway Vertical/Visual Guidance System *(Visual Glide-Slope Indicator System (PAPI))*	**(1)** The precision approach path indicator (PAPI) is the only eligible visual glide-slope system eligible for an airport holding a 14 CFR part 139 certificate. **(2)** Although there are some other older types of visual glideslope systems still in use by some airports, the PAPI is the only eligible visual glide-slope system eligible for funding at facilities used by fixed-wing aircraft without the sponsor providing significant justification to the	A PAPI system that meets FAA standards.	SP RW VI ST RW VI See Table K-1 for the correct work code.

Table K-2 NAVAID and Weather Reporting Equipment Project Requirements

What Can Be Done If Justified	Factors to Consider For Justification and Eligibility	Required Usable Unit of Work and Required Outcome	Work Code*
	ADO as to why a PAPI cannot be installed. **(3)** For non-PAPI installations, the sponsor must obtain a Modification of Standards for siting and installation requirements. **(4)** Per FAA policy, the ADO can only fund a PAPI at a nonprimary airport using nonprimary entitlement funds. **(5)** Per the current versions of Advisory Circular 150/5340-30, Design and Installation of Airport Visual Aids, a four box PAPI is only justified for runways with any jet operations. **(6)** The airport cannot transfer the ownership of these systems to the FAA Air Traffic Organization (ATO). **(7)** The design threshold crossing height angle must not limit the airport or aircraft from the Airplane Design Group shown or forecast on the approved ALP. **(8)** Unless the airport is a nonprimary airport, the project must have a benefit-cost analysis (BCA) ratio of 1.0 or more based on the criteria in the current version of FAA Order 7031.2, Airway Planning Standard Number One Terminal Air Navigation Facilities and ATC Services (APS-1), Appendix 2.		
j. Acquire Snow Removal Equipment *(Weather Support to Deicing Decision-Making)*	**(1)** The WSDDM equipment must be included in an FAA approved snow and ice control plan. If not, the ADO must make this a requirement in the grant offer.	A fully functional WSDDM system.	ST EQ SN

Table K-2 NAVAID and Weather Reporting Equipment Project Requirements

What Can Be Done If Justified	Factors to Consider For Justification and Eligibility	Required Usable Unit of Work and Required Outcome	Work Code*
k. Install Weather Reporting Equipment *(AWOS III or better)*	**(1)** The AJW-144 Weather Processors and Sensors – Non-Federal AWOS website identifies the reference documents containing the design, installation, commissioning, and maintenance requirements for non-Federal AWOS equipment. **(2)** The sponsor must have notified the Service Center Non-Federal Program Implementation Manager (PIM) of its intent to procure and install an AWOS and have received concurrence by the PIM to proceed with the proposed project. **(3)** If a discrete frequency is required, the sponsor must have filed for and received a radio frequency spectrum assignment. Some AWOS may transmit over the existing UNICOM frequency. **(4)** The sponsor must provide the ADO the evidence of PIM concurrence and radio frequency spectrum assignment information. **(5)** A benefit-cost analysis (BCA) is not required if the airport is a primary airport, or if the airport is a National or Regional Airport in the latest published edition of FAA's ASSET report. Otherwise, a new AWOS requires a BCA ratio greater than one; and a proposed replacement, relocation, and/ or rehabilitation of an existing AWOS requires a BCA ratio of 0.5 or greater. **(6)** If a BCA is required, the sponsor must provide the ADO with the documentation required in FAA Form 5100-138, Data Requirements for an Office of	A fully functional, operational, commissioned and FAA-inspected AWOS that meets FAA design standards.	ST EQ WX

Table K-2 NAVAID and Weather Reporting Equipment Project Requirements

What Can Be Done If Justified	Factors to Consider For Justification and Eligibility	Required Usable Unit of Work and Required Outcome	Work Code*
	Airports Automated Weather Observation System (AWOS) Benefit Cost Analysis (BCA) (see the AIP Forms link in Appendix B). The ADO must forward this information to APP-500 so that APP-500 can prepare the benefit-cost analysis. The ADO must advise the sponsor that incomplete documentation will not be accepted, and that the sponsor must allow at least three months after APP-500 has received the data to complete the analysis. **(7)** Because the BCA is based principally on published factual data, unless the sponsor can demonstrate that significant circumstances have changed that may alter the result, APP-500 will not rerun the BCA once the analysis is completed. **(8)** When preparing the BCA, APP-500 will include the full costs of the AWOS, including all fixed costs and variable costs, not simply the incremental cost increase over the basic cost of an AWOS installation. Inclusion of the AWOS data into the Weather Message Switching Center Replacement (WMSCR) is not considered a benefit and must not be included in the BCA to increase the BCA score. **(9)** The ADO must not program the project unless the ADO has received verification that the sponsor has completed PIM coordination, radio spectrum frequency assignment, and received a greater than one benefit-cost analysis. **(10)** No other FAA-owned and/or maintained weather reporting		

Table K-2 NAVAID and Weather Reporting Equipment Project Requirements

What Can Be Done If Justified	Factors to Consider For Justification and Eligibility	Required Usable Unit of Work and Required Outcome	Work Code*
	systems must exist or be planned at the airport. The ADO must confirm this with the PIM. If another FAA-owned system exists or is planned, AIP cannot be used to install an AWOS. **(11)** The sponsor is willing and able to obtain a third party contract, for the life of the equipment, to report the minimum METAR data to the Weather Message Switching Center for the dissemination of weather data. The first 60 days of a subscription cost are allowable costs of the AIP grant, however all costs after the first 60 days are the responsibility of the sponsor. **(12)** The ADO must advise the sponsor that AWOS are not eligible for FAA Air Traffic Organization (ATO) takeover under the current version of FAA Order 6700.20, Non-Federal Navigational Aids and Air Traffic Control Facilities. **(13)** The ADO must advise the sponsor that the sponsor will be responsible for operation and periodic maintenance of the AWOS (including paying the costs of third party reporting contracts and participating in the yearly FAA inspections). **(14)** The sponsor must not limit a bid for an AWOS based on the method of radio transmission. **(15)** Automatic telephone answering systems or radio transmitters are an allowable cost to an AWOS.		
I. Install Weather Reporting Equipment	**(1)** The AJW-144 Weather Processors and Sensors – Non-Federal AWOS website identifies the reference documents for the	A fully functional, operational, commissioned and FAA-inspected	ST EQ WX

Table K-2 NAVAID and Weather Reporting Equipment Project Requirements

What Can Be Done If Justified	Factors to Consider For Justification and Eligibility	Required Usable Unit of Work and Required Outcome	Work Code*
(AWOS A, A/V, I or II)	design, installation, commissioning, and maintenance requirements for non-Federal AWOS equipment. **(2)** The AWOS-A, AWOS-A/V, AWOS-I and AWOS-II are eligible without additional justification. **(3)** No other FAA-owned and/or maintained weather reporting systems must exist or be planned at that airport. The ADO must confirm this with Service Center Non-Federal Program Implementation Manager (PIM), and if another FAA-owned system exists or is planned, AIP cannot be used to install an AWOS. **(4)** The ADO must advise the sponsor that AWOS are not eligible for FAA Air Traffic Organization (ATO) takeover under the current version of FAA Order 6700.20, Non-Federal Navigational Aids and Air Traffic Control Facilities **(5)** The ADO must advise the sponsor that the sponsor will be responsible for operation and periodic maintenance of the AWOS (including paying the costs of third party reporting contracts and participating in the yearly FAA inspections). **(6)** The sponsor must not limit a bid for an AWOS based on the method of radio transmission. Different manufacturers of FAA-certified AWOS may use Unicom or radio discrete frequency transmission. **(7)** Automatic telephone answering systems or radio transmitters are	AWOS that meets FAA design standards.	

Table K-2 NAVAID and Weather Reporting Equipment Project Requirements

What Can Be Done If Justified	Factors to Consider For Justification and Eligibility	Required Usable Unit of Work and Required Outcome	Work Code*
	eligible as an allowable cost to an AWOS. **(8)** A replacement AWOS is eligible if the existing AWOS has reached the end of its useful life.		
m. Install Infrastructure to support Area Navigation (RNAV) Approach *(Parallel Taxiway)*	**(1)** The requirements for parallel taxiway projects that are required for an approved RNAV approach are provided in Appendix H.	N/A	N/A
n. Remove obstructions to support Area Navigation (RNAV) Approach	**(1)** The requirements for obstruction removal projects that are required for an approved RNAV approach are provided in Appendix D.	N/A	N/A
o. Install Approach Aid *(NextGen Equipment such as Ground Based Augmentation System (GBAS)*	**(1)** **APP-400 Coordination**. The ADO (and/or the regional office) must coordinate with APP-400 and have received APP-400 and APP-500 written concurrence with the project. **(2)** **Equipment Location**. AIP funding can install equipment that is physically located on the airfield. This will typically be transmitters and related equipment that augment satellite navigation feeds. No effort has been made to list the eligible types of equipment. Rather, any equipment that meets the prescribed guidelines will be eligible for AIP. **(3)** **Cable Ducts and Cabling**. For AIP funded NextGen equipment, AIP can be used for incidental cable ducts for cabling from the equipment to the processors. FAA Air Traffic Organization (ATO) will install the cabling, work in the tower, or computer hardware or software work. This	A fully functional NextGen system that meets FAA standards.	ST RW IN May be replaced with a new work code.

Table K-2 NAVAID and Weather Reporting Equipment Project Requirements

What Can Be Done If Justified	Factors to Consider For Justification and Eligibility	Required Usable Unit of Work and Required Outcome	Work Code*
	is consistent with current guidance that allows for installation of duct banks for ATO. If the airport installs the empty ducts when it is installing the equipment, the ducts are in-place and ready for ATO to pull cables, install wiring and activate the system at a future date without impacting airport operations. The equipment will be installed and the associated earthwork, grading, and construction of gravel access roads will be included in the AIP grant. **(4) ATO's Responsibility**. Cabling, computer programming and verification testing will remain ATO's responsibility. The integrity of the NAS relies on a computer system that drives the communication, tracking, and surveillance systems together. This entire system is mission-critical. ATO cannot ensure the system integrity if individual airports are asked to modify or install the data systems. **(5) Operation/Maintenance**. As a non-Federal system, the airport is responsible for the maintenance and operation of the approach aid. ATO will not take over the maintenance and operation of the equipment under current NAS strategic plans.		

*The official list of work codes can be obtained from the automated AIP system.

Appendix L. Safety and Security Equipment Projects

L-1. How to Use This Appendix.

This appendix is not a valid stand-alone document for making eligibility and justification determinations. The information in this appendix must be used in conjunction with the Handbook, especially the project cost requirements in Chapter 3.

L-2. Justification for Safety and Security Equipment.

Safety and security projects are not automatically justified. In all cases, the ADO must review these projects to determine if the project meets the eligibility and justification requirements outlined in this Handbook. Safety and security projects that require additional review by the ADO include, but are not limited to, those listed in Paragraph 3-9.

L-3. Safety Equipment beyond 14 CFR part 139 Requirements.

The basic criteria for eligibility of equipment beyond 14 CFR part 139 requirements will be that it is needed to meet a significant safety requirement at a particular airport. The sponsor's justification or reasoning to acquire the equipment with documentation of the features and costs, as well as the 14 CFR part 139 inspector recommendation, must be sent to APP-500. Decisions on funding of safety equipment contributing significantly to the safety of persons and property at an airport will be referred on a case-by-case basis to AAS-1.

L-4. Use of Safety and Security Equipment.

AIP funded equipment cannot be used for non-airport purposes. The exception is when a mutual aid agreement is approved by the 14 CFR part 139 certification inspector. In that case, an AIP funded ARFF vehicle can be used to meet the requirements of that agreement.

L-5. Off-Airport Storage of ARFF Equipment.

The option to allow a sponsor to store ARFF equipment off airport was originally introduced in Program Guidance Letter 07-02.1. This exception was in response to changes in 14 CFR part 139 that required many smaller airports to obtain certification. In order to approve off airport storage of ARFF Equipment the conditions in Table L-1 must be met.

Table L-1 Requirements for Off-Airport Storage of ARFF Vehicles

The requirements include…	
a.	The vehicle must be available for airport use at times necessary to meet 14 CFR part 139 requirements.
b.	The vehicle must not be used for local community needs (AIP funding cannot be used for non-airport purposes and use of the vehicle for non-airport purposes must not reduce the useful life of the vehicles).

Table L-1 Requirements for Off-Airport Storage of ARFF Vehicles

The requirements include…
c. The sponsor must demonstrate to the satisfaction of the ADO that there is no viable on-airport storage solution and the off-airport storage provides a tangible benefit to the airport.
d. The sponsor and the local government entity must execute an agreement that: **(1)** Restricts the use of the vehicle for airport purposes only (except for FAA-approved mutual aid agreement uses). **(2)** Contain language that use of the vehicle of other than airport purposes could require repayment of the grant funding since it would be in violation of the grant conditions. **(3)** Contains provisions for documenting the use of the vehicle.
e. The ADO must forward a copy of the agreement between the sponsor and the local government entity to the 14 CFR part 139 certification inspector so that the certification inspector can ensure that the requirements are included in the certification manual and are being met.
f. The ADO must obtain approval for this request from AAS-300 and ACO-100 prior to issuing approval to the sponsor.

L-6. Radios and Communication Equipment.

Radios and communication equipment for an eligible AIP vehicle or piece of equipment are allowable costs of the eligible AIP vehicle or piece of equipment. This may include installation of ADS-B out vehicle squitters per Advisory Circular 150/5220-26, Airport Ground Vehicle Automatic Dependent Surveillance – Broadcast (ADS-B) Out Squitter Equipment, for vehicles that are used at an airport with FAA ADS-B Surface Surveillance.

L-7. Security Equipment beyond 49 CFR part 1542 Requirements.

Projects exceeding the minimum requirements of 49 CFR part 1542 or that are necessary to support local law enforcement are ineligible. The security equipment that is currently eligible for AIP is included in Table L-2 and the commonly requested security equipment that has been determined ineligible is included in Table C-3.

L-8. Sensitive Security Information.

The ADO must coordinate with a TSA official to identify planning and material that must be protected under 49 CFR part 1520, which governs the release of such information.

L-9. Project Requirements Table.

In addition to the information provided in the above paragraphs and the following table, Appendix C contains examples of prohibited projects and costs and is very useful to use alongside this appendix.

Table L-2 Safety and Security Equipment Project Requirements

What Can Be Done If Justified	Factors to Consider For Justification and Eligibility	Required Usable Unit of Work and Required Outcome	Work Code*
a. Acquire Aircraft Rescue & Firefighting Vehicle	**(1)** The airport must currently hold a 14 CFR part 139 certificate. **(2)** If an airport that does not hold 14 CFR part 139 certificate, AAS-1 must have made an airport specific determination that the vehicle will contribute significantly to the safety or security at the airport (as allowed under 49 USC § 47102(3)(B)(ii)). **(3)** 14 CFR part 139 sets forth minimum extinguishing agents and water required for ARFF vehicles. AIP funding is limited to the minimum number and minimum size of ARFF vehicles required to satisfy 14 CFR part 139 requirements. **(4)** A rapid response vehicle (also called a rapid intervention vehicle) is only eligible if specifically required to satisfy 14 CFR part 139 requirements. **(5)** For an airport that currently holds a 14 CFR part 139 certificate, the ADO may calculate the number of eligible vehicles based on the airport index in accordance with the criteria specified in 14 CFR part 139 for conditions forecast within five years of the proposed ARFF equipment acquisition date provided that the ADO has received written confirmation from its regional certification inspector that the airport meets the other requirements associated with owning an ARFF vehicle, including training, staffing, and maintaining the vehicle. **(6)** In the event of a conflict between the requirements in any applicable advisory circular and 14 CFR part 139, the	A fully operational ARFF vehicle that meets FAA design standards.	SA EQ RF The ST EQ RF is no longer available because it applied to a situation that was in place prior to the 2004 revision to 14 CFR part 139.

Table L-2 Safety and Security Equipment Project Requirements

What Can Be Done If Justified	Factors to Consider For Justification and Eligibility	Required Usable Unit of Work and Required Outcome	Work Code*
	requirements in 14 CFR part 139 take precedence. **(7)** For vehicles that are 10 or more years old, a major rehabilitation is eligible if it extends the useful life by 10 or more years. Forcible aircraft entry tools may also be replaced at this time. **(8)** One set of forcible aircraft entry tools per vehicle is eligible if it is included in the grant for acquisition of an eligible ARFF vehicle and is not acquired as a stand-alone grant. For assistance and/or a list of standard equipment, contact AAS-300. **(9)** Emergency lighting that is mounted to the ARFF vehicles is eligible if it is included in the acquisition of an ARFF vehicle and is not acquired as a stand-alone grant. **(10)** One test charge and one refill of expendable items at the time of initial purchase of an ARFF vehicle are eligible. **(11)** The sponsor must separate the acquisition purchase of the ARFF vehicle and the acquisition of the gear and tools into two procurements. This is because including the gear and tools in the ARFF vehicle procurement documents unnecessarily increases the costs of those items. **(12)** The airport must either include a line item in the ARFF vehicle procurement to mount the necessary ARFF gear to the vehicle or must mount the equipment using its own forces. **(13)** The upgrade of an ARFF vehicle to add enhanced struts is eligible for ARFF vehicles built before		

Table L-2 Safety and Security Equipment Project Requirements

What Can Be Done If Justified	Factors to Consider For Justification and Eligibility	Required Usable Unit of Work and Required Outcome	Work Code*
	2002. Those built after 2002 are required to come equipped with the enhanced struts so an upgrade is neither necessary nor eligible.		
b. Acquire Aircraft Rescue & Firefighting Vehicle *(Structural Firefighting Vehicle)*	**(1)** The airport must hold a 14 CFR part 139 certificate. **(2)** If an airport that does not hold 14 CFR part 139 certificate, AAS-1 must have made an airport specific determination that the vehicle will contribute significantly to the safety or security at the airport (as allowed under 49 USC § 47102(3)(B)(ii)). **(3)** Only one vehicle per airport is eligible. **(4)** The vehicle must be stored on-airport. **(5)** The 14 CFR part 139 certification inspector has determined that the response time for an off airport structural unit exceeds 10 minutes. **(6)** For vehicles that are 10 or more years old, a major rehabilitation is eligible if it extends the useful life by 10 or more years. Forcible aircraft entry tools may also be replaced at this time. **(7)** One set of forcible aircraft entry tools per vehicle is eligible if it is included in the acquisition of an eligible ARFF vehicle and is not acquired as a stand-alone grant. For assistance, contact AAS-300. **(8)** Emergency lighting that is mounted to the ARFF vehicles is eligible if it is included in the acquisition of an ARFF vehicle and is not acquired as a stand-alone grant.	A fully operational structural firefighting vehicle that meets FAA design standards.	SA EQ RF

Table L-2 Safety and Security Equipment Project Requirements

What Can Be Done If Justified	Factors to Consider For Justification and Eligibility	Required Usable Unit of Work and Required Outcome	Work Code*
	(9) One test charge and one refill of expendable items at the time of initial purchase of an ARFF vehicle are eligible. **(10)** The sponsor must separate the acquisition of the ARFF vehicle and the acquisition of the gear and tools into two procurements. This is because including the gear and tools in the ARFF vehicle procurement documents unnecessarily increases the costs of those items. **(11)** The airport must either include a line item in the ARFF vehicle procurement to mount the necessary ARFF gear to the vehicle or must mount the equipment using its own forces. **(12)** The upgrade of an ARFF vehicle to add enhanced struts is eligible for ARFF vehicles built before 2002. Those built after 2002 are required to come equipped with the enhanced struts so an upgrade is neither necessary nor eligible.		
c. Acquire Driver's Enhanced Vision System (DEVS)	**(1)** The airport must have a 14 CFR part 139 certificate and published operations below 1200 feet runway visual range. **(2)** The primary fire station that services the airfield can have DEVS on a maximum of two vehicles per the current version of Advisory Circular 150/5210-19, Driver's Enhanced Vision System. This will provide driver's enhanced vision system (DEVS) equipment to an ARFF vehicle and one additional vehicle. **(3)** In addition, one more DEVS is eligible for each fire station that services the airfield beyond the first station. For instance, an	A fully functional DEVS added to an existing ARFF vehicle in accordance with FAA standards.	ST EQ MS

Table L-2 Safety and Security Equipment Project Requirements

What Can Be Done If Justified	Factors to Consider For Justification and Eligibility	Required Usable Unit of Work and Required Outcome	Work Code*
	airport with two fire stations that service the airfield is eligible for three DEVS. **(4)** Forward-looking infrared system (FLIRS) is a component of DEVS. A stand-alone FLIRS mounted is eligible for AIP eligible ARFF vehicles.		
d. Forward Looking Infrared System	**(1)** Forward looking infrared system (FLIRS) is a component of DEVS. A stand-alone FLIRS mounted is eligible for AIP eligible ARFF vehicles in accordance with the current version of Advisory Circular 150/5210-19, Driver's Enhanced Vision System.	A fully functional FLIRS added to an existing ARFF vehicle in accordance with FAA design standards.	ST EQ MS
e. Acquire Aircraft Rescue & Firefighting Vehicle *(Protective Clothing)*	**(1)** The airport must hold a 14 CFR part 139 certificate. **(2)** If an airport that does not hold 14 CFR part 139 certificate, AAS-1 must have made an airport specific determination that the clothing will contribute significantly to the safety or security at the airport (as allowed under 49 USC § 47102(3)(B)(ii)). **(3)** One suit is eligible for each fire fighter employed full-time to fight aircraft fires. **(4)** For part time positions, the number of suits is limited to a maximum of two per lightweight vehicle and five per large type vehicle. These limitations may be exceeded if approved by the 14 CFR part 139 certification inspector. **(5)** The replacement of personal protective equipment is eligible after the useful life has been reached (see Paragraph 3-12). Self-contained breathing	Protective clothing that meets FAA standards.	SA EQ RF

Table L-2 Safety and Security Equipment Project Requirements

What Can Be Done If Justified	Factors to Consider For Justification and Eligibility	Required Usable Unit of Work and Required Outcome	Work Code*
	apparatus is only replaced when the gear is replaced. **(6)** In addition, the replacement of protective clothing is eligible if the 14 CFR part 139 inspector has verified that the clothing has been destroyed accidentally, or may be otherwise deemed inoperable through no fault of the sponsor.		
f. Regional ARFF Training Facility	**(1)** Project costs may include land, the burn area, maneuvering areas, a control center, an ARFF vehicle with capacity not to exceed 1,500 gallons, the vehicle bay(s), utilities, maintenance facilities, environmental protection, fencing, the access road, and a building for classrooms, showers, and lockers as discussed in the current version of Advisory Circular 150/5210-17, Programs for Training of Aircraft Rescue and Firefighting Personnel. **(2)** One additional ARFF vehicle may be eligible if justified in the view of the 14 CFR part 139 certification inspector based on the mix of area airport indices. **(3)** The 14 CFR part 139 certification inspector must review the list of available training facilities in the area of the proposed facility to avoid duplication. This information is currently available in the addendum to the current version of Advisory Circular 150/5210-17, Programs for Training of Aircraft Rescue and Firefighting Personnel (see Appendix B for link). **(4)** Not all states need such a facility, but if the 14 CFR part 139 certification inspector determines several area-wide training	A fully operational regional ARFF training facility that meets FAA standards.	ST OT RF

Table L-2 Safety and Security Equipment Project Requirements

What Can Be Done If Justified	Factors to Consider For Justification and Eligibility	Required Usable Unit of Work and Required Outcome	Work Code*
	facilities in a state are required due to the area served they must contact APP-500 for additional assistance. **(5)** The initial acquisition of the computer server, software, and dedicated hardware are eligible.		
g. Mobile ARFF Training Facility	**(1)** The airport has a 14 CFR part 139 certificate and is required to comply with Index A or B ARFF standards. **(2)** The airport must be more than 100 miles from the nearest regional training facility. The FAA CertAlerts contain the latest list of facilities. At the time this Handbook was published, the current list was in FAA CertAlert 09-07 (see Appendix B for link). **(3)** The ADO has the option to contact AAS-100 regarding the design requirements of this equipment. **(4)** Mobile training equipment is also eligible for acquisition by states if it will benefit more than one airport. **(5)** The initial acquisition of the computer server, software, and dedicated hardware are eligible.	A fully operational mobile ARFF training facility that meets FAA design standards.	ST OT RF
h. Acquire Aircraft Rescue & Firefighting Vehicle *(Water Rescue Equipment)*	**(1)** The airport must hold a 14 CFR part 139 certificate. **(2)** If an airport that does not hold 14 CFR part 139 certificate, AAS-1 must have made an airport specific determination that the equipment will contribute significantly to the safety or security at the airport (as allowed under 49 USC § 47102(3)(B)(ii)).	A fully operational piece of water rescue equipment that meets FAA design standards.	SA EQ RF

Table L-2 Safety and Security Equipment Project Requirements

What Can Be Done If Justified	Factors to Consider For Justification and Eligibility	Required Usable Unit of Work and Required Outcome	Work Code*
	(3) The 14 CFR part 139 certification inspector determines that the equipment is need at the airport. **(4)** Acquisition of a helicopter for water rescue must be supported by additional justification and AAS-1 and APP-1 must have concurred with the action.		
i. Acquire Equipment *(Power Vacuum Sweeper for Foreign Object Debris (FOD))*	**(1)** The power sweeper is for the control of debris on the airport. **(2)** Per FAA policy, eligibility is limited as follows. **(a)** Where the primary areas are less than 500,000 square yards and the where the airports annual operations level is 40,000 or less, one power sweeper is eligible. **(b)** Where the primary areas are 500,000 square yards or more, or where the airports annual operations level is more than 40,000, two power sweepers are eligible.	A fully operational sweeper that meets FAA design standards.	ST EQ MS
j. Acquire Equipment *(Acquire Fixed Foreign Object Debris (FOD) Detection Equipment)*	**(1)** AAS-100 has determined that FOD detection equipment contributes "significantly to the safety or security of individuals and property" at an airport as described in 49 USC § 47102(3)(B)(ii). **(2)** The airport must be a large hub airport. **(3)** The sponsor must provide the following information to the ADO: **(a)** Number of aircraft operations per average 24-hour period for the selected runway. **(b)** Distribution of operations and percentage of airport departures over a 24-hour period on the selected runway.	A fully operational fixed FOD Detection System that meets FAA standards.	ST EQ MS

Table L-2 Safety and Security Equipment Project Requirements

What Can Be Done If Justified	Factors to Consider For Justification and Eligibility	Required Usable Unit of Work and Required Outcome	Work Code*
	(c) Percentage of wide body aircraft using selected runway per day and overall diversity of fleet-mix using the runway. **(d)** Surface material and condition of selected runway. **(e)** Climatic conditions at the airport. **(f)** Significant construction activity on or near the airfield. **(g)** If available, historical data of FOD at the airport and/or on the specific runway being considered. **(4)** The airport is eligible for either one fixed system for a single primary runway at the airport, or one mobile system, not both. **(5)** Selection of airports receiving FOD detection systems will be made by APP-1; therefore, after the sponsor has submitted the required information to the ADO, the regional office must submit the proposal to APP-1. **(6)** AIP participation is limited to 50% of the eligible items associated with the project at the normal Federal share. **(7)** Reimbursement of administrative costs is limited to $2,000. **(8)** The system must be configured to provide real time alerts, FOD identification, and FOD location to airport operations personnel. **(9)** The airport must continue to comply with all 14 CFR part 139 requirements for detection and removal of FOD. **(10)** Installation of a FOD detection system is a categorically excluded action unless		

Table L-2 Safety and Security Equipment Project Requirements

What Can Be Done If Justified	Factors to Consider For Justification and Eligibility	Required Usable Unit of Work and Required Outcome	Work Code*
	extraordinary circumstances exist. **(11)** Optional features that exceed FAA design standards for system output requirements are not eligible for AIP and may not be used as a basis for selection of the system.		
k. Acquire Equipment *(Acquire Mobile Foreign Object Debris (FOD) Detection Equipment)*	**(1)** AAS-100 has determined that FOD detection equipment contributes "significantly to the safety or security of individuals and property" at an airport as described in 49 USC § 47102(3)(B)(ii). **(2)** The airport must be a large hub airport. **(3)** The sponsor must provide the following information to the ADO: **(a)** Number of aircraft operations per average 24-hour period for the selected runway. **(b)** Distribution of operations and percentage of airport departures over a 24-hour period on the selected runway. **(c)** Percentage of wide body aircraft using selected runway per day and overall diversity of fleet-mix using the runway. **(d)** Surface material and condition of selected runway. **(e)** Climatic conditions at the airport. **(f)** Significant construction activity on or near the airfield. **(g)** If available, historical data of FOD at the airport and/or on the specific runway being considered. **(4)** The airport is eligible for either one fixed system for a single	A fully operational mobile FOD Detection System that meets FAA standards.	ST EQ MS

Table L-2 Safety and Security Equipment Project Requirements

What Can Be Done If Justified	Factors to Consider For Justification and Eligibility	Required Usable Unit of Work and Required Outcome	Work Code*
	primary runway at the airport, or one mobile system. **(5)** Selection of airports receiving FOD detection systems will be made by APP-1; therefore, after the sponsor has submitted the required information to the ADO, the regional office must submit the proposal to APP-1. **(6)** AIP participation is limited to 50% of the eligible items associated with the project at the normal Federal share. **(7)** Reimbursement of administrative costs is limited to $2,000. **(8)** Acquisition of a mobile FOD detection system may also include the vehicle on which the equipment is mounted if the airport does not already own a suitable vehicle that can be converted to FOD detection system use. The use of the FOD detection vehicle is strictly limited to FOD detection. The maximum reimbursement for the vehicle is $15,000, regardless of the type, size, or options selected for the vehicle. **(9)** A separate Buy American determination must be made for the vehicle. **(10)** The system must be configured to provide real time alerts, FOD identification, and FOD location to airport operations personnel. **(11)** The airport must continue to comply with all 14 CFR part 139 requirements for detection and removal of FOD. **(12)** Installation of a FOD detection system is a categorically excluded action unless		

Table L-2 Safety and Security Equipment Project Requirements

What Can Be Done If Justified	Factors to Consider For Justification and Eligibility	Required Usable Unit of Work and Required Outcome	Work Code*
	extraordinary circumstances exist. **(13)** Optional features that exceed FAA design standards for system output requirements are not eligible for AIP and may not be used as a basis for selection of the system.		
I. Acquire Equipment *(Avian Radar System)*	**(1)** On October 4, 2010, AAS-1 determined that avian radar systems contribute significantly to the safety or security at an airport, which makes them eligible under 49 USC § 47102(3)(B)(ii). **(2)** The airport has a wildlife hazard management plan that has been accepted by the FAA. **(3)** The airport has an ongoing bird harassment plan in place incorporating the recommendations for continued harassment by airport employees to reduce wildlife hazards. **(4)** If the airport is a 14 CFR part 139 airport and has an Airport Certification Manual, the manual must include the requirements for operation and maintenance of the avian radar system, as well as requirements for analyzing the incoming data feeds, tracking the data, and acting on the data trends. **(5)** The airport must have a training plan in place that includes initial and yearly follow-up training on the proper use of radar readings, analysis and interpretation. **(6)** The costs of acquiring the radar equipment, installing the antenna(s) and radar equipment, and acquiring the Digital Radar Signal Processor are allowable	A fully operational avian radar system that meets FAA standards.	ST EQ MS *Note: Do not use SA EQ MS. APP-500 decided that ST EQ MS is the work code that must be used.*

Table L-2 Safety and Security Equipment Project Requirements

What Can Be Done If Justified	Factors to Consider For Justification and Eligibility	Required Usable Unit of Work and Required Outcome	Work Code*
	costs. However, because accommodating the equipment is essentially providing space for airport employees to monitor the radar, the costs of modifying existing office space to accommodate the radar equipment, acquiring a mobile trailer, and constructing a permanent structure to support the avian radar equipment is not allowable. **(7)** Because the proper placement of the antenna includes an initial trial placement, the costs of a trial installation and a final operational installation are allowable. **(8)** The airport must maintain data to evaluate the radar performance until advised otherwise by the FAA. This must include the daily archives or radar recordings of birds tracked, related logs of birds harassed, hours in service, hours out of service, service and repair records, and updates to software or hardware. The data must be available for review by the FAA upon request. **(9)** Replacement of the system is only eligible after the useful life of the whole system has been met.		
m. Acquire Equipment *(Initial Squitter Acquisition)*	**(1)** The acquisition of squitters is limited to the 35 ASDE-X equipped airports or the 8 civil airports that are scheduled to receive ASSC. **(2)** APP-1 must select the specific airport for participation in the squitter acquisition program. **(3)** Acquisition is limited to 75 squitters. **(4)** By FAA policy, the APP-1 sets the maximum grant amount for a	Up to 75 squitter units installed and operational in existing sponsor-owned and operated vehicles.	ST EQ MS

Table L-2 Safety and Security Equipment Project Requirements

What Can Be Done If Justified	Factors to Consider For Justification and Eligibility	Required Usable Unit of Work and Required Outcome	Work Code*
	squitter project on an annual basis. **(5)** Squitters may use either the 1090 ES or 978 MHz/UAT link. **(6)** Only products that have been approved following certification testing may be acquired. **(7)** FAA Air Traffic Organization (ATO) Surveillance and Broadcast Services will generate the squitter transmit map. **(8)** Only ADS-B out is allowable (ADS-B in is not eligible). **(9)** Squitters are limited to installation in airport-owned, airport employee-operated vehicles that operate on pavements that are controlled by FAA Air Traffic Control, such as snow plows, airport rescue and firefighting vehicles, and airside operations vehicles. **(10)** The sponsor must provide a listing of the vehicle, assigned use (such as airside operational vehicle), and its airside designation (such as Operations Vehicle OPS-1, ARF-2) to the ADO. **(11)** The costs of acquiring computer hardware, software or software subscription services used in support of airport surface displays are not allowable. **(12)** Costs for installation and commissioning services, including Site Acceptance Testing (SAT) are allowable.		
n. Wildlife Hazard Reduction Equipment	**(1)** Equipment for broadcasting distress calls, exploding gas cannons, shotguns, and pyrotechnic pistols are eligible if recommended in a wildlife hazard	A fully operational piece of equipment.	ST EQ MS

Table L-2 Safety and Security Equipment Project Requirements

What Can Be Done If Justified	Factors to Consider For Justification and Eligibility	Required Usable Unit of Work and Required Outcome	Work Code*
	management plan or a written sponsor's adoption of a wildlife hazard site visit report. **(2)** The airport has an ongoing bird harassment plan in place incorporating the recommendations for continued harassment by airport employees to reduce wildlife hazards.		
o. Wildlife Hazard Habitat Modification	**(1)** The project must be recommended by a wildlife hazard management plan or a written sponsor's adoption of a wildlife hazard site visit report. However, these recommendations are not automatically eligible or justified. **(2)** Some wildlife hazard reduction equipment (see this appendix), some avian radar system (see this appendix), some wildlife fencing (see this appendix) and some airport drainage (see Appendix D) is normally eligible and justified. **(3)** For other potentially eligible projects (like tree removal or pond meshing), the ADO must consult both APP-520 (for eligibility) and AAS-300 (for feasibility) prior to grant programming.	A completed project that reduces wildlife attractants.	ST OT MS
p. Install Perimeter Fencing required by 49 CFR 1542	**(1)** TSA must have approved the airfield access control project in writing as being needed to meet the minimum requirements of 49 CFR part 1542. **(2)** The fencing project may include closed circuit monitoring of the airfield boundary or guard shacks. Guard shacks must be minimal in nature (no additional office space, restrooms, etc.).	A complete fencing installation that meets the 49 CFR part 1542 requirements.	SA EQ SE

Table L-2 Safety and Security Equipment Project Requirements

What Can Be Done If Justified	Factors to Consider For Justification and Eligibility	Required Usable Unit of Work and Required Outcome	Work Code*
	(3) The closed circuit cameras must be for the secured airfield area. **(4)** Unless the TSA has approved the use of an electric locking device or automatic gate, only standard gate and mechanical locking devices are eligible.		
q. Install Perimeter Fencing *not* Required by 49 CFR part 1542	**(1)** The proposed fencing must be identified on the approved airport layout plan to be eligible. **(2)** If the purpose of the fence is to discourage wildlife, the fence is not eligible unless it is justified by a wildlife hazard management plan (mandatory for Class I-III 14 CFR part 139 certificated airports) or a written sponsor's adoption of a wildlife hazard site visit report (required for non-certificated airports). Either type of documentation is acceptable for Class IV 14 CFR part 139 certificated airports. In addition, the fence must met FAA design standards for wildlife fencing. **(3)** If the purpose of the fencing is to discourage unauthorized access to the airfield by people or vehicles, the fence must be reasonable for the type of situation. **(a)** Five foot high chain link fence is reasonable within 500 feet of a terminal area because it is considered a sensitive security area. **(b)** Fencing around the remainder of the airfield perimeter is only needed to serve as a notice of legal boundary. Five foot high woven wire fence, which is significantly more economical than chain link fence, is reasonable. For urban areas, no more than a five foot chain	A complete fencing installation that increases safety of the airfield.	ST EQ SE

Table L-2 Safety and Security Equipment Project Requirements

What Can Be Done If Justified	Factors to Consider For Justification and Eligibility	Required Usable Unit of Work and Required Outcome	Work Code*
	link fence is also considered reasonable. **(4)** Epoxy-coated fencing is not considered reasonable for perimeter fencing. **(5)** Unless the ADO has approved the use of an electric locking device or automatic gate, only standard gate and mechanical locking devices are eligible.		
r. Command and Control Centers, also known as Emergency Operations Centers	**(1)** Command and Control Centers, or Emergency Operations Centers are not specifically required under 49 CFR part 1542 and are not consider security or safety equipment. **(2)** The requirements for Command and Control Centers or Emergency Operations Centers are found in Chapter 1.Appendix A.	A fully operational command and control center console for airfield security.	ST BD MS
s. Security Enhancements *(Fingerprinting Equipment for Background Checks)*	**(1)** The TSA must have approved, in writing, that the airport is required by 49 CFR part 1542 to have a badging system that requires background checks. **(2)** The type of equipment and quantity to permit processing of three employees per hour is eligible provided the airport has that turnover rate. **(3)** Equipment certified by the Federal Bureau of Investigation is listed on their website.	Fully functional fingerprinting equipment.	SA EQ SE
t. Security Enhancements *(Terminal Access Control)*	**(1)** TSA must have approved the terminal access control system, in writing, as being needed to meet the minimum requirements of 49 CFR part 1542. **(2)** Replacement of the systems and software is only eligible after the	A fully operational access control system that meets 49 CFR part 1542.	SA EQ SE

Table L-2 Safety and Security Equipment Project Requirements

What Can Be Done If Justified	Factors to Consider For Justification and Eligibility	Required Usable Unit of Work and Required Outcome	Work Code*
	useful life of the system has been met. **(3)** The closed circuit cameras must be for the secured terminal area. **(4)** If the terminal access control system is being installed as part of larger terminal project, the ADO has the option of coding the project as a separate security project or as part of the terminal project.		
u. Security Enhancements *(Police Vehicle)*	**(1)** TSA must have approved the police vehicle, in writing, as being needed to meet the minimum requirements of 49 CFR part 1542. **(2)** The primary purpose of the police vehicle must be for perimeter patrol of the airfield operational area or other secured airfield area. **(3)** Only one police vehicle is allowed. The vehicle must be a standard police vehicle. **(4)** The airport must have a 14 CFR part 139 certificate.	A fully operational standard police vehicle that meets 49 CFR part 1542.	SA EQ SE
v. Security Enhancements *(Badging Equipment)*	**(1)** TSA have approved the badging equipment, in writing, as being needed to meet the minimum requirements of 49 CFR part 1542.	Fully operational badging equipment that meets 49 CFR part 1542.	SA EQ SE
w. Security Enhancements *(Apron Lights)*	**(1)** Although apron lighting may be a recommendation from TSA, a TSA letter is not mandatory. Apron lighting requirements are listed in Table J-4.	N/A	N/A

*The official list of work codes can be obtained from the automated AIP system.

Appendix M. Other Equipment Projects

M-1. How to Use This Appendix.

This appendix is not a valid stand-alone document for making eligibility and justification determinations. The information in this appendix must be used in conjunction with the Handbook, especially the project cost requirements in Chapter 3.

M-2. Project Requirements Table.

In addition to the information provided in the above paragraph and the following table, Appendix C contains examples of prohibited projects and costs and is very useful to use alongside this appendix.

Table M-1 Other Equipment Project Requirements

What Can Be Done If Justified	Factors to Consider For Justification and Eligibility	Required Usable Unit of Work and Required Outcome	Work Code*
a. Acquire Aircraft Deicing Equipment	**(1)** The equipment must be owned by the airport and be available on a non-exclusive use basis for any aircraft owner. **(2)** Vehicles and equipment for aircraft deicing and anti-icing on the ground are eligible at any NPIAS airport.	A fully functional piece of aircraft deicing equipment that meets FAA design standards.	ST EQ DI
b. Acquire Interactive Training System	**(1)** The systems and software must be for federally required safety and security requirements, or training related to the Americans with Disabilities Act and the Clean Air Act (42 USC § 7401). **(2)** The initial acquisition of the server, software, and dedicated hardware are eligible. **(3)** Replacement of the systems and software is only eligible after the useful life of the training system has been met. **(4)** New training modules to add new eligible material are eligible.	A fully functional interactive training system that meets FAA design standards.	OT EQ MS
c. Emergency Generator (Acquire, Install or Rehabilitate)	**(1)** Fixed standby generators necessary to support the following lighting on Cat II/III	A fully functional emergency generator that	ST EQ LI

Table M-1 Other Equipment Project Requirements

What Can Be Done If Justified	Factors to Consider For Justification and Eligibility	Required Usable Unit of Work and Required Outcome	Work Code*
	runways are eligible (not limited to entitlement funding): **(a)** Runway touch down zone, centerline, and edge lights. **(b)** Land and hold short lights. **(c)** Taxiway edge lights for taxiways serving the runway. **(d)** Surface movement guidance and control system (SMGCS) lights. **(2)** Specific airports have been designated as continuous power airports and are eligible for fixed generators (not limited to entitlement funding). They provide continuous operations in the event of an area wide power failure. The current versions of FAA Order 6030.20, Electrical Power Policy, and FAA Order 6950.2, Electrical Power Policy Implementation at National Airspace System Facilities, list these airports and the designated runways. These orders outline the fixed generator requirements. **(3)** Per FAA policy, for airports that do not meet one of the two criteria listed above, one fixed generator is eligible to support AIP eligible airside infrastructure. Only entitlement funds can be used in this case. **(4)** Per FAA policy, fixed emergency generators are only eligible for terminal use for the specific purpose of meeting life safety code requirements for building evacuation of the public use areas (not to allow the terminal to continue operations). **(5)** The generator must be a fixed generator, not a mobile generator.	meets FAA design standards.	

Table M-1 Other Equipment Project Requirements

What Can Be Done If Justified	Factors to Consider For Justification and Eligibility	Required Usable Unit of Work and Required Outcome	Work Code*
d. Acquire Snow Removal Equipment	**(1)** For 14 CFR part 139 certificated airports: **(a)** Equipment required for clearing snow and ice from the runways, principal taxiways, aprons, and emergency access roads is eligible. **(b)** The equipment must be justified based on the current versions of Advisory Circular 150/5200-30, Airport Field Condition Assessments and Winter Operations Safety and Advisory Circular 150/5220-20, Airport Snow and Ice Control Equipment. **(c)** As of September 24, 2014, Advisory Circular 150/5200-30, Airport Field Condition Assessments and Winter Operations Safety and Advisory Circular 150/5220-20, Airport Snow and Ice Control Equipment, permits a sponsor to specify multi-task equipment (MTE). An MTE counts as two pieces of equipment for eligibility purposes (a plow and a broom). **(d)** The number of eligible pieces must be determined using the above two advisory circulars and the airport's approved Snow and Ice Control Plan, and there must be existing FAA specifications for the equipment. **(e)** Eligibility is limited to the minimum requirements recommended by the advisory circulars unless the ADO approves the airport's assertion that the volume of traffic requires additional equipment. Sponsors must have submitted	A fully functional piece of snow removal equipment that meets FAA standards.	ST EQ SN

Table M-1 Other Equipment Project Requirements

What Can Be Done If Justified	Factors to Consider For Justification and Eligibility	Required Usable Unit of Work and Required Outcome	Work Code*
	detailed information supporting additional equipment and the ADO must have agreed with the justification. **(2)** For airports that are not 14 CFR part 139 certificated airports: **(a)** Per FAA policy, only one snow removal carrier vehicle is eligible unless the ADO concurs that the airport is large enough, busy enough, and/or has significant snowfall to warrant an additional vehicle. **(b)** The equipment must be designed and justified based on the current versions of Advisory Circular 150/5200-30, Airport Field Condition Assessments and Winter Operations and Advisory Circular 150/5220-20, Airport Snow and Ice Control Equipment. **(c)** Per FAA policy, incidental use on non-AIP eligible surfaces is permitted at nonprimary airports without an active 14 CFR part 139 certificate only if: **(i)** The activity does not significantly degrade the SRE useful life. **(ii)** The SRE is used only for airport purposes and will not be used off airport. **(iii)** The SRE is only used by airport employees. **(iv)** The SRE is generally used for activities on AIP eligible surfaces. **(v)** The incidental use is not used as part of the SRE justification or as part of		

Table M-1 Other Equipment Project Requirements

What Can Be Done If Justified	Factors to Consider For Justification and Eligibility	Required Usable Unit of Work and Required Outcome	Work Code*
	the design requirements when procuring the SRE. **(3)** The sponsor must provide the ADO with a current FAA Form 5100-141, Inventory of Snow Removal Equipment (see the AIP Forms link in Appendix B). **(4)** Fixed and portable snow melters are eligible in very limited circumstances and must have been coordinated and approved by APP-500. The airport must be able to document that there is no other safe and efficient way to remove snow without adversely impacting aircraft operations.		
e. Acquire Friction Measuring Equipment	**(1)** Only a self-contained device or a towed device is eligible. Airports must provide their own towing vehicles for towed devices. **(2)** The airport must be a commercial service airport, hold a 14 CFR part 139 certificate, and have scheduled turbojet operations. **(3)** This equipment can be acquired for use at multiple neighboring airports. State aviation agencies may sponsor such projects.	A fully functional piece of friction measuring equipment (if towed, truck to be paid for with local funds) that meets FAA design standards.	ST EQ SR

*The official list of work codes can be obtained from the automated AIP system.

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Appendix N. Terminal Building Projects

N-1. How to Use This Appendix.

This appendix is not a valid stand-alone document for making eligibility and justification determinations. The information in this appendix must be used in conjunction with the Handbook, especially the project cost requirements in Chapter 3.

N-2. Eligibility of Terminals Non-Commercial Service Airports.

It is not clear in the Act that non-commercial service airports can receive a grant for terminal development. However, this congressional intent is clearly contained in § 512(d) of House Report 108-143 to Vision 100 (Public Law 108-176). This section indicates that 49 USC § 47119(c)(5) (formerly (b)(5)) "permits a general aviation airport to use its AIP entitlement for terminal development." H.R Report 108-143 § 512(d), 2003 WL 21301449, 72. Both revenue producing and non-revenue producing terminal development can be funded using nonprimary entitlements.

N-3. Public-Use and Movement of Passengers/Baggage Requirements.

Terminal development is defined under 49 USC § 47102(28). 49 USC § 47119 further defines the eligible space within terminal development projects as public-use areas that are directly related to the movement of passengers and baggage in terminal facilities within the boundaries of the airport.

In order to determine if a particular area within a terminal is eligible, it must be a public-use area per Table N-1 and it must be for the movement of passengers and baggage per Table N-2.

Table N-1 Public-Use Requirements for Terminal Buildings

The space must be public use as follows…
a. Public use spaces are those areas that passengers may need to occupy as part of their air travel. Areas such as airport administration offices or conference rooms (even if occasionally accessed by the public) are not considered public-use.
b. Public use spaces include the utility support space needed to make the public space operational, including the mechanical and electrical rooms.
c. Public use spaces do not include areas such as airport operations areas, police areas, administrative space, janitor's closets, and meetings and conference rooms, even though the public may occasionally go to some of these areas.

Table N-1 Public-Use Requirements for Terminal Buildings

The space must be public use as follows…
d. General aviation terminals can be stand-alone buildings, collocated within a commercial service terminal, or collocated within a fixed base operator (FBO) facility. What makes general aviation terminal areas eligible is that they are public use. In the case of general aviation terminal area that is collocated within an FBO, the areas behind the counter, office space, and conference room space (even if occasionally used by the public for meetings) are not considered public-use and are not eligible as terminal development. Although this space is ineligible as terminal development, it may be eligible under the revenue producing aeronautical support facility eligibility rules and requirements in Table O-3.
e. Areas that are past passenger screening (meaning that only ticketed passengers may access the public-use area) may still be considered public-use.

Table N-2 Movement of Passengers and Baggage Requirements

The space must be directly related to the movement of passengers or baggage as follows…
a. The prime function of a terminal building is to allow passengers and baggage to move from the curb of the terminal building to an airplane. Other uses that may be constructed in a terminal building may be public-use, but may not be directly related to moving passengers and baggage.
b. If the area does not need to be at an airport, but could be located somewhere else, it is not directly related to the movement of passengers and baggage and is not eligible. For example, a satellite office for a county's Department of Motor Vehicles may be public-use, but it is not directly related to the movement of passengers and baggage and is therefore not eligible.
c. Stores and restaurants for the convenience of the general traveling public are considered related to the movement of passengers. However, these facilities are subject to the revenue producing limitations outlined in Paragraph N-4, and the eligible area is limited to the space that the general public can access.

N-4. Revenue Producing Eligibility and Conditions for Terminal Buildings.

Revenue producing areas are eligible as outlined in Table N-3.

Table N-3 Revenue Producing Eligibility and Conditions for Terminal Buildings

For the following size airports…	Revenue producing areas are…	And the following conditions apply…
a. Large, medium, or small hub primary	Ineligible	N/A
b. All other airports	Eligible	**(1)** The area must be public-use per 49 USC § 47119(a)(1). The ability to fund revenue producing terminal areas at these airports under 49 USC § 47119(a)(2) does not remove this requirement. **(2)** The sponsor must certify any needed airport development project affecting safety, security or capacity will not be deferred due to the revenue producing project. These certifications are required per 49 USC § 47119(a)(2)(B) and the sponsor must provide this certification in writing to the ADO. Per FAA policy, deferring a needed capacity project includes allowing airfield pavement to deteriorate to a poor to failed condition.

N-5. Safety, Security, and Access Needs Met.

Per 49 USC § 47119(a)(1)(A), the sponsor must certify that it has, on the date of submittal of the project application, all the applicable 14 CFR part 139 safety and 49 CFR part 1542 security equipment required by rule or regulation. In addition, the sponsor must certify that they have provided access and equipment for passengers boarding or exiting non-air carrier aircraft. The sponsor must provide this certification in letter format to the ADO.

N-6. Terminal Areas Related to Security (Landside, Sterile, and Secured).

A terminal building is divided into roughly three different areas (landside, sterile area, and secured area). The TSA is responsible under 49 CFR part 1544 for controlling access between the landside and the sterile area. The airport is responsible under 49 CFR part 1542 for controlling access to the secured area.

a. Landside. This is the area that is accessible to the general public.

b. Sterile Area. This area (as more fully defined in 49 CFR part 1540) is restricted to passengers, airline employees and others who have passed airport security.

c. Secured Area. This area (as more fully defined in 49 CFR part 1540) is the portion of terminal or terminal ramp that has direct access to the aircraft.

N-7. Prorated Areas and High Cost Eligible/Ineligible Items.

AIP cannot be used to pay for items or costs that are not eligible or allowable. The way this is addressed in terminals, which contain a mix of both eligible and ineligible areas, is by prorating the total cost.

The easiest method of proration is to use the ratio of the square footage of the eligible areas to the total area. High cost eligible and ineligible items of equipment must not be included in the proration calculations, but added (or deducted) separately to avoid skewing the result. An example of a high cost eligible item is a passenger loading bridge or an escalator/elevator. An example of a high cost ineligible item is a large commissioned sculpture. The formula for determining the eligible cost of a terminal building is in Table N-4.

In addition, the requirements for including ineligible or non-AIP funded work in the contract in Paragraph 3-39 must be met.

Table N-4 Terminal Eligibility Proration Calculation

Step	Action
1	Determine the square footage for each of the following categories: A: Eligible Areas B: Ineligible Areas C: Prorated Areas (areas that needed for utilities such as mechanical, electrical, or water) D: High Cost 100% Eligible Items (Examples: Passenger loading bridges, escalators, elevators) E: High Cost 100% Ineligible Items (Example: Large commissioned sculpture, ineligible build out costs)
2	Determine the eligible proration % as follows: Eligible Proration % = A / (A+B)
3	Determine the eligible cost as follows: Eligible Cost = [(Cost of A+B+C) * (Eligible Proration %)] + (Cost of D)

N-8. Terminal Area Impacted by an AIP Eligible Terminal Project.

If the area being impacted would normally be AIP eligible, then this area can be replaced with AIP funding under the project. If the area being impacted is not AIP eligible (such as a revenue producing restaurant in a small, medium, or large hub airport), only the demolition of the impacted area is eligible. This impacted area is considered an ineligible sponsor facility and cannot be replaced with AIP funding (see Paragraph 3-74).

N-9. Typical Eligible Areas/Equipment within a Terminal Building.

Table N-5 contains typical eligible areas within a terminal building. As further discussed in Paragraph 3-6, replacement of carpeting (or other flooring, such as tiles or terrazzo), painting,

wall coverings, ceiling tiles, and fixed public use seating (including tables and counters) in a terminal are considered ineligible maintenance items if they are not directly required as a result of an eligible terminal project.

Table N-5 Typical Eligible Areas/Equipment within a Terminal Building

The following terminal areas/equipment…
a. Ticketing lobby from entrance to ticket counters (but not including the ticket counters or the areas behind the counters).
b. Other lobbies used by passengers and guests (commonly called *meeters and greeters*).
c. The public use-portion of the baggage claim delivery areas (including lost baggage retrieval areas). This includes the baggage carousel equipment (even though by function, a portion of the carousel is located in the non-public area).
d. A prorated amount of the space for equipment needed to make the public space operational, including the mechanical and electrical rooms.
e. Public-use corridors to boarding areas.
f. Central waiting rooms.
g. Passenger boarding bridges at commercial service terminals.
h. Public restrooms.
i. Gate holding areas, including fixed public-use seating (including fixed tables and counters) within the holding area.
j. Directional signs and non-exclusive use flight information display systems (FIDS) and baggage information display systems (BIDS).
k. Passenger screening areas that are used directly for the inspection of passengers have limited eligibility. Eligibility is limited to the construction of bare space (drywall, standard paint, and standard floor covering) with appropriate utilities.
l. Customs and Border Control (formerly Federal Inspection Service) areas that are used directly for the inspection of individuals and goods have limited eligibility . Eligibility is limited to the construction of bare space (drywall, standard paint, and standard floor covering) with appropriate utilities and baggage carousels. Note that these can be separate buildings, but still are considered terminal development. Customs and Border Control must verify that the building is sized to the staffing levels that will be provided (note that the funding source of the staffing does not affect eligibility).
m. The FAA has determined that public use areas for general aviation operations are eligible areas (even within commercial service terminals). Note that these can be separate buildings, but still are considered terminal development.

Table N-5 Typical Eligible Areas/Equipment within a Terminal Building

The following terminal areas/equipment…
n. Terminal modifications to accommodate in-line baggage screening as required by 49 CFR part 1542. In-line explosive detection system (EDS) equipment is eligible for AIP funding. However, from FY 2004 to the publication date of this Handbook, the FAA appropriations bill has prohibited using AIP grant funds on EDS systems or any building modifications that are necessary to support or install an EDS system. Because PFC eligibility is based on AIP eligibility, leaving the project eligible but prohibiting use of AIP still allows these projects to be funded with PFCs. TSA determines the size of the facility and the amount of equipment. Normally, this consists of EDS machines, various baggage conveyer systems, monitoring cameras and rooms, and baggage containment rooms. Associated space for staff rooms, offices, and break rooms are not considered necessary components of an EDS installation.
o. Acquiring and installing facilities and equipment to provide air conditioning, heating, or electric power from terminal-based (not mobile), non-exclusive use facilities to aircraft per 49 USC § 47102(3)(O). This type of work used to only be eligible if approved under the Voluntary Airport Low Emissions (VALE) program, but is now also eligible as terminal development outside of the VALE program and does not require the airport to be in a nonattainment or maintenance area. 49 USC § 47102(3)(O) limits eligibility to those facilities that will reduce energy use or harmful emissions as compared to aircraft based systems. There is ample scientific evidence that using power from the terminal rather than from the aircraft will reduce emissions, therefore, per FAA policy, the airport does not have to provide any documentation supporting this assertion. Terminal-based aircraft air conditioning, heating or electric power will be eligible following all of the funding, usage, and hub size requirements for other terminal projects.
p. Although a sponsor has the option to include a command and control center in the terminal, it is not required to be in a terminal. The ADO has the option of separating the command and control center out into a separate project (prorating the cost of the square footage) or including it as eligible terminal development (in which case the terminal funding rules would apply). Regardless of which method the ADO choses (as a separate project or as part of the terminal), the command and control center must meet all of the requirements in Appendix N.
q. If the terminal is a multimodal, only the area that is public use for the movement of passengers and baggage is eligible.
r. Incidental use of public space for display, advertising, or vending machines for public convenience will not make the space ineligible, although modifications to install these items are not eligible.
s. Service animal relief areas to comply with Title II of the Americans with Disabilities Act of 1990 (42 USC § 12101 et seq.).
t. Elevators to normally ineligible areas of the terminal (such as the airport offices to accommodate public meetings) if the elevators are necessary for the *sponsor* to comply with Title II of the Americans with Disabilities Act of 1990 (42 USC § 12101 et seq.). The elevators are 100% eligible (do not have to be prorated to reflect the ineligible areas being served).
u. Other accommodations to normally ineligible areas of the terminal (such as the airport offices to accommodate public meetings) if the accommodations are necessary for the sponsor to comply with Title II of the Americans with Disabilities Act of 1990 (ADA) (42 USC § 12101 et seq.). The ADO must contact the FAA Office of Civil Rights (ACR) to determine if the accommodations are required under ADA.

Table N-5 Typical Eligible Areas/Equipment within a Terminal Building

The following terminal areas/equipment…
v. If the terminal access control system (see Table L-2 for requirements) is being installed as part of larger terminal project, the ADO has the option of coding the project as a separate security project or as part of the terminal project. In addition, the space required to house the associated computer equipment is eligible. If the area to house the equipment is also an office or other ineligible use, that portion of the area remains ineligible.
w. A public address system in the public use portions of the terminal is an allowable cost of terminal development (similar to lights in the public area and the sprinkler system in the public area). This is because the public address system is necessary for the movement of passengers and baggage in the public portion of the terminal.

N-10. Additional Eligible Terminal Areas/Equipment at Nonhub Primary and Nonprimary Airports.

In addition to the eligible areas listed in Paragraph N-9, nonhub primary and nonprimary airports may be eligible for the areas listed in Table N-6.

Table N-6 Additional Eligible Terminal Areas/Equipment at Nonhub Primary and Nonprimary Airports

Additional eligible terminal areas/equipment at nonhub primary and nonprimary airports includes the public-use space associated with…
a. Ticket counters at commercial service airports (but not the areas behind the counters).
b. Rental car counters (but not the area behind the counter).
c. The public portion of concession areas (the part that the general public can actually access) that is commonly found in airports such as restaurants, lounges, business centers, snack bars, snack vending areas, seating areas for snack areas/restaurants, newsstands, rental car areas, ground transportation and bookstores. Although not considered directly related to the movement of passengers or baggage per 49 USC § 47119(a)(1)(B), these areas are eligible under 49 USC § 47119(a)(2) as terminal development. However, the eligibility is limited to the construction of bare space (drywall, standard paint, and standard floor covering) with appropriate utilities and fixed public-use seating (including fixed tables and counters).
d. Nonrevenue parking lots for the parking of vehicles of passengers and persons meeting or delivering passengers.
e. A pilot briefing area or pilot lounge at general aviation terminals if the area is open to the public.

N-11. Terminal Building Funding Rules by Airport Type.

The funding rules for terminal buildings are listed in Table N-7.

Table N-7 Terminal Building Funding Rules by Airport Type

For the following airport type…	The following funding rules apply…
a. Large, Medium and Small Hub Airports	**(1) Passenger Entitlements (Allowed).** The ADO is only allowed to apply passenger entitlement funds at large, medium and small hub airports. 49 USC § 47119(c)(1) authorizes funds from amounts apportioned under 49 USC § 47114(c)(1), which is the statutory reference for passenger entitlement. **(2) Discretionary (Potentially allowed at a small hub primary that has changed from a nonhub primary).** Per 49 USC § 47108(e)(3), if a nonhub primary airport changes to a small hub primary when a phased terminal development project that has received discretionary is underway, the project remains eligible for discretionary under the nonhub airport discretionary funding rules for three fiscal years after the start of the construction project (or longer if the ADO approves an extension). **(3) Discretionary (Allowed at a small hub airport with exactly .05% of the annual passenger boardings up to $20 million total).** 49 USC § 47119(c)(3) authorizes funds from the discretionary fund and the Small Airport Fund at a small hub airport with exactly .05% of the annual passenger boardings. On February 14, 2012, the FAA Modernization and Reform Act of 2012 (Public Law 112-95) added 49 USC § 47119(f), which limits the amount of discretionary to $20 million for the cumulative total of *all* terminal development project costs as of February 14, 2012 at that airport. See the definition for terminal development in Appendix A for an explanation of what needs to be included in the $20 million dollar calculation (including what portion of the access road must be included). **(4) All Other Funding (Not allowed).** The Act does not authorize other funding at large, medium or small hub airports except as listed above.
b. Nonhub Primary Airports	**(1) Passenger Entitlements (Allowed).** The ADO can apply passenger entitlement funds at nonhub primary airports. 49 USC § 47119(c)(1) authorizes funds from amounts apportioned under 49 USC § 47114(c)(1), which is the formula for passenger entitlements. **(2) Discretionary (Allowed up to $20 million total).** 49 USC § 47119(c)(3) authorizes funds from the discretionary fund and the Small Airport Fund at nonhub primary airports. On February 14, 2012, the FAA Modernization and Reform Act of 2012 (Public Law 112-95) added 49 USC § 47119(f), which limits the amount of discretionary to $20 million for the cumulative total of *all* terminal development project costs as of February 14, 2012 at that airport. See the definition for terminal development in Appendix A for an explanation of what needs to be included in the $20 million dollar calculation (including what portion of the access road must be included). **(3) All Other Funding (Not allowed).** The Act does not authorize other funding at these airports except as listed above.

Table N-7 Terminal Building Funding Rules by Airport Type

For the following airport type…	The following funding rules apply…
c. Nonprimary Commercial Service	**(1) Nonprimary Entitlement (Allowed).** The ADO can apply nonprimary entitlement funds at nonprimary commercial service airports. 49 USC § 47119(c)(5) authorizes funds from amounts apportioned under 49 USC § 47114(d)(3)(A), which is the reference for nonprimary entitlements. **(2) Discretionary (Allowed up to $200,000 per fiscal year).** 49 USC § 47119(c)(2) authorizes funds from the discretionary fund under 49 USC § 47115 at nonprimary commercial service airports. The Small Airport Fund cannot be used because 49 USC § 47119(c)(3) only authorize the use of these funds at small hub airports with exactly .05% of the annual passenger boardings and nonhub primary airports. **(3) All Other Funding (Not allowed).** The Act does not authorize other funding at these airports except those listed above.
d. Reliever Airports	**(1) Discretionary (Allowed up to $200,000 per fiscal year).** 49 USC § 47119(c)(2) authorizes funds from the discretionary fund under 49 USC § 47115 at these airports. After review of the legislative history, the FAA has determined that 49 USC § 47119(c)(2) allows reliever airports to use discretionary on a terminal building, regardless if the airport has commercial service. The Small Airport Fund cannot be used because 49 USC § 47119(c)(3) only authorize the use of these funds at small hub airports with exactly .05% of the annual passenger boardings and nonhub primary airports. **(2) Discretionary (Potentially allowed for a reliever airport that has dropped from commercial service).** Per 49 USC § 47108(e)(2), if a commercial service airport (either a nonprimary commercial service or a hub airport) changes to a noncommercial service airport (either a reliever or general aviation airport) when a phased terminal development project is underway, the project remains eligible for discretionary under the funding rules for the previous airport type. **(3) Nonprimary Entitlement (Allowed).** The ADO can apply nonprimary entitlements at reliever airports. 49 USC § 47119(c)(5) authorizes funds from amounts apportioned under 49 USC § 47114(d)(3)(A), which is the reference for nonprimary entitlements. After review of the legislative history, the FAA has determined that 49 USC § 47119(c)(5) allows reliever airports to use nonprimary entitlements on a terminal building, regardless of whether the airport has commercial service. **(4) All Other Funding (Not allowed).** The Act does not authorize other funding at reliever airports except those listed above.

Table N-7 Terminal Building Funding Rules by Airport Type

For the following airport type…	The following funding rules apply…
e. General Aviation Airports (Excluding Reliever Airports)	**(1) Discretionary (Potentially allowed for a general aviation airport that has dropped from commercial service).** Per 49 USC § 47108(e)(2), if a commercial service airport (either a nonprimary commercial service or a primary airport) changes to a noncommercial service airport (either a reliever or general aviation airport) when a phased terminal development project is underway, the project remains eligible for discretionary under the original funding rules for the previous airport type. **(2) Nonprimary Entitlement (Allowed**). The ADO can apply nonprimary entitlements at general aviation airports. 49 USC § 47119(c)(5) authorizes funds from amounts apportioned under 49 USC § 47114(d)(3)(A), which is the reference for nonprimary entitlements. After review of the legislative history, the FAA has determined that 49 USC § 47119(c)(5) allows general aviation airports to use nonprimary entitlements on a terminal building, regardless if the airport has commercial service. **(3) All Other Funding (Not Allowed).** The Act does not authorize other funding at these airports except those listed above.

N-12. Project Requirements Tables.

In addition to the information provided in the above paragraphs and the following tables, Appendix C contains examples of prohibited projects and costs and is very useful to use alongside this appendix.

Table N-8 Terminal Work Codes

If the project is justified as follows……	Use the following work codes…
a. The project meets the definition of a capacity project (see Appendix A).	CA TE XX
b. The project meets the definition of a standards project (see Appendix A).	ST TE XX

Table N-9 Terminal Project Requirements

What Can Be Done If Justified	Factors to Consider For Justification and Eligibility	Required Usable Unit of Work and Required Outcome	Work Code*
a. Construct Terminal Building	**(1)** The ADO must have concurred with the sponsor's terminal sizing methodology. The ADO and regional office may contact APP-400 for assistance on terminal design and justification. **(2)** To the extent possible, the development must meet the anticipated terminal needs for the 10 years after project completion. **(3)** Modification/rehabilitation of existing facilities must be considered before the ADO can consider new terminal development. The ADO can consider funding new terminal development if costs are comparable to modification/rehabilitation of existing facilities and the new construction will provide better flexibility, ability to expand, or a longer useful life. **(4)** Because of the requirement for public use, by FAA policy, gates cannot be leased for more than 10 years and must not be subject to a majority in interest clause. **(5)** The project must be supported by an FAA-accepted planning study. **(6)** A project for walkways that lead directly to or from a terminal is eligible terminal development per 49 USC § 47102(28)(iii). Per FAA policy, walkways include surface sidewalks, moving sidewalks, tunnel walkways, stairs, and overhead walkways. Covers or canopies over surface sidewalks may be included in a walkway project when necessary to protect	A complete terminal building to allow the movement of passengers and baggage.	CA TE CO ST TE CO See Table N-8 for the correct work code.

Table N-9 Terminal Project Requirements

What Can Be Done If Justified	Factors to Consider For Justification and Eligibility	Required Usable Unit of Work and Required Outcome	Work Code*
	concentrations of persons from the weather such as at passenger loading or unloading areas. In addition, only the portion of the walkway that is on airport is eligible. **(7)** Per 49 USC § 47119(a)(1)(A), the airport has all safety equipment required for the airport per 49 USC § 44706 (Airport Operating Certificates), has all security equipment required by rule or regulation, and has provided for access by passenger to the area of the airport for boarding or exiting aircraft that are not air carrier aircraft. **(8)** Per 49 USC § 47119(a)(1), only public-use areas of the terminal are allowable (regardless of the revenue producing status of the area). **(9)** ADOs may use the current versions of Advisory Circular 150/5360-13, Planning and Design Guidelines for Airport Terminal Facilities and Advisory Circular 150/5360-9, Planning and Design of Airport Terminal Facilities at Non-Hub Locations for additional guidance. However, the eligibility and justification rules within this Handbook must be followed for AIP funded terminals. **(10)** The ADO must coordinate all multimodal terminal projects with APP-520 prior to programming the associated grant.		
b. Expand Terminal Building	**(1)** The requirements for Construct Terminal Building apply. **(2)** This work code is used for physical expansion to increase	A completed terminal expansion with an increase in the number of gates,	CA TE EX ST TE EX` See Table N-8

Table N-9 Terminal Project Requirements

What Can Be Done If Justified	Factors to Consider For Justification and Eligibility	Required Usable Unit of Work and Required Outcome	Work Code*
	the number of gates, ticket counters, or baggage carousels. **(3)** The ADO must coordinate all multimodal terminal projects with APP-520 prior to programming the associated grant.	ticket counters, or baggage carousels.	for the correct work code.
c. Modify Terminal Building	**(1)** The requirements for Construct Terminal Building apply. **(2)** This may include modification needed for security screening, modifications to meet Federal mandates, or modifications needed to accommodate a new class of aircraft at the terminal. **(3)** The ADO must coordinate all multimodal terminal projects with APP-520 prior to programming the associated grant.	A completed modification of the building that allows for a specific additional function.	CA TE IM ST TE IM See Table N-8 for the correct work code.
d. Rehabilitate Terminal Building	**(1)** The requirements for Construct Terminal Building apply. **(2)** This may include the replacement of eligible major capital equipment systems that will extend the useful life of the terminal building or replacement of a fixed building component. **(3)** Rehabilitate Terminal Building projects are: **(a)** Major renovation of public restrooms. **(b)** Replacement or major overhaul of public elevators, escalators, and moving sidewalks. **(c)** Major replacement of a significant percentage of a terminal roof. **(d)** Replacement of a significant portion of the terminal	A complete renovation that extends the useful life by the minimums in Paragraph 3-12 (note that equipment may have a shorter minimum useful life than the building).	CA TE IM ST TE IM See Table N-8 for the correct work code.

Table N-9 Terminal Project Requirements

What Can Be Done If Justified	Factors to Consider For Justification and Eligibility	Required Usable Unit of Work and Required Outcome	Work Code*
	windows in the public-use areas. **(4)** The ADO must coordinate all multimodal terminal projects with APP-520 prior to programming the associated grant.		
e. Improve Terminal Building	**(1)** The requirements for Construct Terminal Building apply. **(2)** Justification for improvement of a terminal building will rely on a terminal study that justifies improvements based on improved passenger or baggage handling. It will involve adding new capabilities that do not currently exist at the terminal, generally through the installation of new capital equipment. **(3)** Improve terminal building projects may include installations of: **(a)** New baggage carousels. **(b)** Loading bridges. **(c)** Pedestrian walkways. **(d)** Elevators or escalators. **(e)** Preconditioned air/power for aircraft parked at a gate per 49 USC § 47102(3)(O). **(4)** The ADO must coordinate all multimodal terminal projects with APP-520 prior to programming the associated grant.	A completed improvement of the building that adds new capabilities.	CA TE IM ST TE IM See Table N-8 for the correct work code.
f. Acquire Passenger Lift Device	**(1)** This is eligible under 49 USC § 47102(3)(F). **(2)** The equipment must be required for compliance with the Americans with Disabilities Act of 1990 (42 USC 12101 et seq)	A new lift device that meets FAA design standards.	ST TE MS

Table N-9 Terminal Project Requirements

What Can Be Done If Justified	Factors to Consider For Justification and Eligibility	Required Usable Unit of Work and Required Outcome	Work Code*
	(3) The equipment must be used to board passengers on an aircraft, not to transport passengers between gates in airport terminals (these are considered people mover projects and are covered under Appendix P). **(4)** The sponsor must include specific information describing the vehicle or equipment that is being acquired in the project description of the application.		

*The official list of work codes can be obtained from the automated AIP system.

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Appendix O. Other Building Projects

O-1. How to Use This Appendix.

This appendix is not a valid stand-alone document for making eligibility and justification determinations. The information in this appendix must be used in conjunction with the Handbook, especially the project cost requirements in Chapter 3.

O-2. Aircraft Rescue & Firefighting Building Costs at 14 CFR part 139 Airports.

The main purpose of an ARFF building is to protect the grant-funded ARFF vehicle. For airports without a 14 CFR part 139 certificate a minimal structure to house and protect the grant funded ARFF vehicle is usually all that is justified.

More areas and items are eligible at an airport with a 14 CFR part 139 certificate. However, the current version of Advisory Circular 150/5210-15, Aircraft Rescue and Firefighting Station Building Design, contains facilities that are not required and will not be considered justified for project funding. Table O-1 narrows these FAA design standards to the allowable costs for AIP funding. Although the advisory circular allows for a 20% increase in the size of the areas without receiving FAA approval, this does not apply to AIP eligibility. Only the minimum space required for the eligible function is allowable under AIP unless the ADO provides written approval. In order to provide such approval, the ADO must have determined that there is justification for the increase and must document this justification and determination in the grant file.

Table O-1 Allowable Costs for Areas in an ARFF Building at 14 CFR part 139 Certificated Airports

For the following area/items…	The following cost criteria apply…
a. Vehicle bays	The number of eligible bays is limited to that necessary for housing eligible ARFF equipment. Space for a structural fire truck is eligible if the structural fire truck is allowable.
b. Maintenance bay	A maintenance bay may be allowable within an ARFF building if all of the requirements for maintenance facilities in Table O-3 are met.
c. Administrative space	Administrative space is limited to a common area for maintaining department files and documents. This may include an open area to accommodate a desk for the shift commander and one administrative staff member (when applicable).
d. Watch/alarm room	The space is limited to that necessary for a consolidated area to receive emergency calls, dispatch ARFF vehicles and direct support resources.
e. Support rooms	Space for necessary gear, medical equipment storage, and decontamination is allowable.

Table O-1 Allowable Costs for Areas in an ARFF Building at 14 CFR part 139 Certificated Airports

For the following area/items…	The following cost criteria apply…
f. Personnel facilities	The number of personnel (as required by 14 CFR part 139 response times or local government staffing requirements) for the eligible ARFF vehicles determines the allowable personnel space requirements. Allowable areas include a day room, dormitories, locker rooms, restrooms, bathrooms, shower facilities, a kitchen, and a laundry room.
g. Training	The number of personnel (as required by 14 CFR part 139 response times or local government staffing requirements) for the eligible ARFF vehicles determines allowable training space requirements.
h. Furnishings, appliances, and support utilities	Minimum fixed furnishings and utilities to serve the building are allowable. This includes cabinets, a stove, a refrigerator, and a sink. One fixed emergency generator and one fixed air compressor of sufficient size to operate the ARFF bay system and one fixed compressor to maintain the readiness of self-contained breathing apparatus (SCBA) are allowable.

O-3. Project Requirements Tables.

In addition to the information provided in the above paragraphs and the following tables, Appendix C contains examples of prohibited projects and costs and is very useful to use alongside this appendix.

Table O-2 Distinctions between Construct, Expand, Modify, Improve, and Rehabilitate

Use the following description…	If the project will…
a. Construct	Build a brand new building.
b. Expand	Add on to an existing building.
c. Modify	Change a building.
d. Improve	Provide a distinct new feature to a building.
e. Rehabilitate	Extend the useful life of a building by completing major renovation or major replacement of parts of the building.

Table O-3 Other Building Project Requirements (Other than Terminals)

What Can Be Done If Justified	Factors to Consider For Justification and Eligibility	Required Usable Unit of Work and Required Outcome	Work Code*
a. Aircraft Rescue & Firefighting Building (Construct, Expand, Modify, Improve, or Rehabilitate)	**(1)** The building must be sized according to the airport's ARFF index. **(2)** Allowable building costs are discussed in Paragraph O-2. **(3)** The difference between construct, expand, modify, improve, and rehabilitate is listed in Table O-2. **(4)** The ADO must determine that only the allowable areas listed in Table O-3 are included in the project. **(5)** The ADO has the option to fund limited employee vehicle parking necessary to support essential ARFF personnel on duty. **(6)** The ADO has the option to fund an airside service road for access to the facility. However, note that service roads are not eligible for maintenance under AIP (only runway, taxiway, and apron maintenance at certain airports is eligible).	A fully functional ARFF building.	SA BD EX
b. Aircraft Rescue & Firefighting Building (Rehabilitate) *(Replace Communication System)*	**(1)** Total replacement of the ARFF communication system is eligible for a stand-alone project every 10 years and is coded as rehabilitation.	A new, fully functional ARFF communication system.	SA BD EX
c. Snow Removal Equipment Building (Construct, Expand, Modify, Improve, or Rehabilitate)	**(1)** Snow removal equipment buildings are intended to protect the AIP funded snow removal equipment and materials. **(2)** Funding snow and ice control buildings is limited to space in the building necessary for eligible Snow Removal Equipment as well as storing abrasive or chemicals used in treatment of paved areas.	A fully functional snow removal equipment building.	ST BD SN

Table O-3 Other Building Project Requirements (Other than Terminals)

What Can Be Done If Justified	Factors to Consider For Justification and Eligibility	Required Usable Unit of Work and Required Outcome	Work Code*
	All other areas and equipment recommended in the current version of Advisory Circular 150/5220-18, Buildings for Storage and Maintenance of Airport Snow and Ice Control Equipment and Materials, must be paid for by the sponsor. **(3)** The eligibility of a maintenance bay for safety and security equipment is provided elsewhere in this table and may be included in the SRE building if the requirements for the safety and security equipment maintenance bay are met. **(4)** At the time the building is programmed, the eligible equipment must be owned, on order, or budgeted by the airport within the next five years. **(5)** The SRE building is not intended to function as personnel quarters, snow desk, training space, or other functions. It is only intended for storage of eligible equipment. If non-eligible equipment storage is included in the building, the requirements for including ineligible or non-AIP funded work in the contract in Paragraph 3-39 must be met. **(6)** The difference between construct, expand, modify, improve, and rehabilitate is listed in Table O-2. **(7)** The ADO has the option to fund limited employee vehicle parking necessary to accommodate essential snow removal personnel on duty. **(8)** The ADO has the option to fund an airside service road for access to the facility. However, note that service roads are not eligible for		

Table O-3 Other Building Project Requirements (Other than Terminals)

What Can Be Done If Justified	Factors to Consider For Justification and Eligibility	Required Usable Unit of Work and Required Outcome	Work Code*
	pavement maintenance under AIP (only runway, taxiway, and apron pavement maintenance at certain airports is eligible). **(9)** For airports that are not 14 CFR part 139 certificated airports and are only eligible for one snow removal carrier vehicle, it is FAA policy that a 1600 square foot SRE building is eligible. In the instance where two vehicles are eligible, a 2000 square foot SRE building is eligible.		
d. Construct Sand and Chemical Storage Building (Construct, Expand, Modify, Improve, or Rehabilitate)	**(1)** Small stand-alone buildings for storage of airport surface deicing chemicals and sand may be constructed if the size and design is appropriate for the facility. **(2)** This function may also be incorporated as eligible area in a snow removal equipment building. **(3)** Snow and ice control abrasive or chemicals are to be used for airport pavement (not aircraft) because 49 USC § 47102(3)(G) does not permit the purchase or storage of deicing materials for aircraft. **(4)** The difference between construct, expand, modify, improve, and rehabilitate is listed in Table O-2.	A fully functional sand and chemical storage building.	ST BD SN
e. Miscellaneous Building (Construct, Expand, Modify, Improve, or Rehabilitate) *(Maintenance Bay or Service Facility)*	**(1)** One service facility (also called a maintenance bay) for maintaining required safety and security equipment at airports with a 14 CFR part 139 certificate may be funded. For AIP purposes, snow removal equipment is not considered safety or security equipment. Only ARFF equipment is allowed to be used to justify and size the building.	A fully functional maintenance or service area or building.	ST BD MS

Table O-3 Other Building Project Requirements (Other than Terminals)

What Can Be Done If Justified	Factors to Consider For Justification and Eligibility	Required Usable Unit of Work and Required Outcome	Work Code*
	(2) The facility must not exceed 1500 square feet in size and may be co-located within an existing or new building or in its own free standing building. **(3)** The eligible area is determined by adding 10 feet to the length and 10 feet to the width of the largest ARFF vehicle serving the airport, then multiplying these two dimensions for the bay size and adding a like amount for support space. **(4)** The ADO must confirm whether the airport already has an existing maintenance or service bay in the ARFF or SRE buildings. If so, an additional facility is not justified. **(5)** Eligibility is limited to the construction of bare space with appropriate utilities. **(6)** The building/area must not be used for storage of any equipment or materials. Limited use of the facility to maintain other airport eligible equipment is permitted provided such use does not adversely affect maintenance of the eligible ARFF vehicles. **(7)** The difference between construct, expand, modify, improve, and rehabilitate is listed in Table O-2.		
f. Miscellaneous Building (Construct, Expand, Rehabilitate) *(Aircraft Hangar, Fixed Based Operator (FBO) Building, or Aircraft*	**(1)** For MAP funded hangars, see Appendix T, as many of the following requirements do not apply for MAP projects. **(2)** 49 USC § 47102(3)(24) specifically allows expansion and construction of sponsor owned hangars that the ADO has determined will increase the revenue producing ability of the airport. In addition,	A fully functional aircraft hangar, FBO building, or aircraft maintenance building.	ST BD MS

Table O-3 Other Building Project Requirements (Other than Terminals)

What Can Be Done If Justified	Factors to Consider For Justification and Eligibility	Required Usable Unit of Work and Required Outcome	Work Code*
Maintenance Building)	49 USC § 47102(3)(24) allows expansion and construction of sponsor owned aeronautical support facilities that the ADO has determined will increase the revenue producing ability of the airport. The FAA has determined that this includes sponsor owned FBOs and aircraft maintenance buildings. **(3)** The only rehabilitation allowed under 49 USC § 47102(3)(24), is major rehabilitation of a sponsor owned hangar. **(4)** Per 49 USC § 47110(h), the airport must be a nonprimary airport. **(5)** Only nonprimary entitlements funding may be used for the building. **(6)** Per 49 USC § 47110(h), the sponsor must certify that all airfield needs have been accommodated before the ADO can fund a revenue producing aeronautical support facilities. Per FAA policy, the sponsor must adequately demonstrate to the ADO that airside needs within the next three years (current fiscal year and next two future fiscal years) will be accommodated through local funds or nonprimary entitlement funds. It is APP-500 policy that the sponsor requests for AIP would be limited to non-primary entitlement funds during that time unless there is a specific safety issue that must be addressed and was not foreseeable under normal planning efforts of the sponsor. **(7)** Per 49 USC § 47102(24), the use of the building must only be for aeronautical purposes (storage of		

Table O-3 Other Building Project Requirements (Other than Terminals)

What Can Be Done If Justified	Factors to Consider For Justification and Eligibility	Required Usable Unit of Work and Required Outcome	Work Code*
	property other than aircraft or aircraft supplies is not allowed). Non-aeronautical uses are not allowed. **(8)** The use and lease of the building must meet the compliance requirements outlined in the current version of FAA Order 5190.6, FAA Airport Compliance Manual. **(9)** The difference between construct, expand, modify, improve, and rehabilitate is listed in Table O-2. **(10)** The apron in front of a building that cannot be used for public parking or taxiing of aircraft is considered part of the building (and the associated building funding rules apply). This includes the wingtip clearance from the building as defined in the current version of Advisory Circular 150/5300-13, Airport Design. **(11)** The taxilane/taxiway that exclusively serves a building is also considered part of the building (and the associated building funding rules apply). **(12)** The ADO has the option to fund limited landside vehicle parking necessary to support the functions of the building. **(13)** The acquisition of existing buildings involves further review of existing environmental issues, useful life issues, and reverter clause issues. Therefore, the ADO must coordinate these requests with APP-520 and ACO-100. **(14)** If the FBO is collocated with the general aviation terminal, the public use area can be funded as		

Table O-3 Other Building Project Requirements (Other than Terminals)

What Can Be Done If Justified	Factors to Consider For Justification and Eligibility	Required Usable Unit of Work and Required Outcome	Work Code*
	terminal development as discussed in Appendix N. The areas behind the counter, office space, and conference room space (even if occasionally used by the public for meetings) are not considered public-use and are not eligible as terminal development.		
g. Miscellaneous Building (Construct, Expand, Modify, Improve, or Rehabilitate) *(Command and Control Center or Emergency Operations Center)*	**(1)** Only the portion of the building dedicated to airfield security is eligible. By FAA policy, this only includes the prorated building cost for a single position at the console and must not include the cost for equipment or furniture that is not fixed or mounted. In addition, the requirements for including ineligible or non-AIP funded work in the contract in Paragraph 3-39 must be met. **(2)** This is not specifically required under 49 CFR part 1542, therefore a letter from TSA is not mandatory for AIP funding. **(3)** Although a sponsor has the option to include a command and control center in the terminal, it is not required to be in a terminal and is therefore not considered terminal development. **(4)** For ease of prorating the eligible costs of a Command and Control Center, the square footage allowed for the single position is limited to a maximum of 500 square feet (which includes consideration of common spaces in the center.) For example, in a 5,000 center, the maximum AIP participation is limited to 500 square feet/5,000 square feet, or 10% of the total project cost.	A fully operational command and control center console for airfield security.	ST BD MS
h. Miscellaneous Building	**(1)** If an airport proposes state apportionments for these projects,	Construction or equipment to	ST BD MS

Table O-3 Other Building Project Requirements (Other than Terminals)

What Can Be Done If Justified	Factors to Consider For Justification and Eligibility	Required Usable Unit of Work and Required Outcome	Work Code*
(Construct, Expand, Modify, Improve, or Rehabilitate) *(Contract Air Traffic Control Tower (ATCT))*	those funds may be used provided the ADO consults with the state aviation official and obtains the state's support for the project as part of its airport capital improvement plan. State apportionment funds may only be used on projects that are to be undertaken in the future rather than for retroactive funding. The project file must include the state's written support. **(2)** Only the equipment contained in the Federal Contract Tower Minimum Equipment List is eligible for AIP funding. **(3)** The FAA Air Traffic Organization (ATO) must provide a letter or comparable documentation stating that the airport was selected to be a participant in the FAA Contract Tower program under 49 USC § 47124 or that the construction of the ATCT would qualify the sponsor to be added to the program and it will seek appropriations for the airport to be in the contract tower program. The ADO must keep a copy of this documentation in the grant file. **(4)** The Federal share of the cost of planning and construction is limited to a cumulative maximum of $2.0 million per airport per 49 USC § 47124(b)(4)(C). In addition, the type of AIP funding is limited per Paragraph 4-7. **(5)** Eligible costs include the ATCT structure and equipment inside it. **(6)** ATO standards must be met for ATCT equipment in an AIP project. Modification of any	support a contract control tower that meets FAA standards.	

Table O-3 Other Building Project Requirements (Other than Terminals)

What Can Be Done If Justified	Factors to Consider For Justification and Eligibility	Required Usable Unit of Work and Required Outcome	Work Code*
	equipment standard must have been approved by ATO. **(7)** For projects that were completed after October 1, 1996, retroactive funding of the ATCT and equipment is eligible, provided the airport demonstrates statutory requirements were met. For instance, the project must have been accomplished using DBE, minimum wage, veteran's preference, environmental approval, and other requirements under 2 CFR part 200). **(8)** The sponsor must certify in the FAA operating agreement and the cost share agreement, if applicable, that it will pay its share of the cost to equip, maintain and operate the ATCT. **(9)** The ATCT must be located so that it does not conflict with the airport design requirements in the current version of Advisory Circular 150/5300-13, Airport Design. **(10)** The ATCT must be based on the current version of FAA Order 6480.4, Air Traffic Control Tower Siting Process. **(11)** The difference between construct, expand, modify, improve, and rehabilitate is listed in Table O-2.		
i. Law Enforcement Facilities	**(1)** The only eligible law enforcement facilities are airfield facilities to provide for a law enforcement presence required for air transportation security. The FAA has determined that the only facilities that meet these requirements are guard shacks at airfield access points. Guard	N/A	N/A

Table O-3 Other Building Project Requirements (Other than Terminals)

What Can Be Done If Justified	Factors to Consider For Justification and Eligibility	Required Usable Unit of Work and Required Outcome	Work Code*
	shacks are coded under security fencing (see Table L-2).		

*The official list of work codes can be obtained from the automated AIP system.

Appendix P. Roads and Surface Transportation Projects

P-1. How to Use This Appendix.

This appendix is not a valid stand-alone document for making eligibility and justification determinations. The information in this appendix must be used in conjunction with the Handbook, especially the project cost requirements in Chapter 3.

P-2. Project Requirements Tables.

In addition to the information provided in the above paragraph and the following tables, Appendix C contains examples of prohibited projects and costs and is very useful to use alongside this appendix.

Table P-1 Distinctions between Construct, Expand, Modify, Improve, and Rehabilitate

Use the following description…	If the project will…
a. Construct	Build a brand new road or surface transportation facility.
b. Expand	Add on to an existing road or surface transportation facility.
c. Modify	Change a road or surface transportation facility.
d. Improve	Provide a distinct new feature to a road or surface transportation facility.
e. Rehabilitate	Extend the useful life of a road or surface transportation facility.

Table P-2 Road and Surface Transportation Work Codes

If the project is justified as follows……	Use the following work codes…
a. The project meets the definition of a capacity project (see Appendix A).	CA GT XX
b. The project meets the definition of a standards project (see Appendix A).	ST GT XX

Table P-3 Roads and Surface Transportation

What Can Be Done If Justified	Factors to Consider For Justification and Eligibility	Required Usable Unit of Work and Required Outcome	Work Code*
a. Access Road (Construct, Expand, Modify, Improve, or Rehabilitate)	**(1)** The terminal development definition in Appendix A defines which portion of the access road is treated as terminal development and therefore is subject to the funding restrictions for terminal development in Table N-7. **(2)** Generally, only one connection from the airport to the public road is allowable. However, more than one connection is eligible if the airport surface traffic is of sufficient volume to require more than one connection (must be supported by traffic counts and a recent traffic study) or there is no landside access to reach aeronautical facilities from any portion of the access road. **(3)** The connection from the airport to the public road may only extend to the nearest public highway of sufficient capacity to accommodate airport traffic. **(4)** Access roads directly to or from a terminal and an eligible or an ineligible area (such as a revenue producing parking lot or rental car facility) are eligible. This is because 49 USC § 47119(a)(1)(B) provides that access roads to and from a terminal is eligible because it is directly related to moving passengers and baggage in air commerce within the airport. **(5)** Access roads must be located on the airport or within a right-of-way acquired by the sponsor. **(6)** The access road must serve exclusively airport traffic. This means that an access road cannot be prorated. In mixed use situations of airport/nonairport use, only the portion of the road	A complete roadway access system that ties the public highway to the airport.	CA GT AC OT GT AC See Table P-2 for the correct work code.

Table P-3 Roads and Surface Transportation

What Can Be Done If Justified	Factors to Consider For Justification and Eligibility	Required Usable Unit of Work and Required Outcome	Work Code*
	that is beyond the non-airport access point is allowable. **(7)** Related facilities such as acceleration and deceleration lanes, exit and entrance ramps, street lighting, guidance and traffic signs, and bus stops may be included in the access road project when they are a necessary part of an eligible access road. **(8)** Guidance signs are not eligible unless they are required as part of an eligible road project, a major roadway reconfiguration, or a complete replacement of the signage system because the signs have met the end of their useful life. Airport entrance signs are not eligible. **(9)** Per FAA policy, bike lanes are allowable as part of access road development and must meet all of the other access road requirements. **(10)** The pavement must not have been reconstructed within the last 20 years; rehabilitated within the last 10 years, or resealed within the last 3 years except as allowed in Paragraph 3-12. **(11)** The application of asphalt seal coats or resealing of joints in concrete pavement is also eligible as a stand-alone project provided: **(a)** A major portion of the access road is being addressed; **(b)** The ADO concurs with the need for the project. **(12)** Recirculation roads and cell phone waiting lots are allowable if the ADO has determined that the additional costs are minimal, and can be included in the access road project, but not as a stand-		

Table P-3 Roads and Surface Transportation

What Can Be Done If Justified	Factors to Consider For Justification and Eligibility	Required Usable Unit of Work and Required Outcome	Work Code*
	alone project. Allowable cell phone waiting area costs are limited to those necessary to allow cars to remove themselves from the roadway circulation traffic and safely wait for arriving passengers. Areas for unattended car parking and amenities such as telephones, seating, flight information display boards are not considered necessary and are therefore are not eligible. **(13)** Like access roads, a project for walkways that lead directly to or from a terminal is eligible terminal development per 49 USC § 47102(28)(A)(iii); and the walkway can be included as part of the access road project. Per FAA policy, walkways include surface sidewalks, moving sidewalks, tunnel walkways, stairs, and overhead walkways. Covers or canopies over surface sidewalks may be included in a walkway project when they are necessary to protect concentrations of persons from the weather such as at passenger loading or unloading areas. In addition, only the portion of the walkway that is on airport is eligible. **(14)** The difference between construct, expand, modify, improve, and rehabilitate is listed in Table P-1.		
b. Service Road (Construct, Expand, Modify, Improve, or Rehabilitate)	**(1)** Airfield service roads are eligible as follows: **(a)** A service road for ARFF access to a runway or runway safety area. **(b)** A service road for separation of vehicles and aircraft justified on the basis of safety as determined by a	A fully functional service road that provides access to the intended area.	OT GT SV

Table P-3 Roads and Surface Transportation

What Can Be Done If Justified	Factors to Consider For Justification and Eligibility	Required Usable Unit of Work and Required Outcome	Work Code*
	14 CFR part 139 inspector or a Runway Safety Action Team recommendation. **(c)** A gravel service road located along the perimeter fence if necessary for security (and supported by a letter from TSA) or for safety (as determined by a 14 CFR part 139 inspector or a Runway Safety Action Team recommendation). The road must be on airport property and per FAA policy is limited to a 15 foot wide gravel road. **(d)** A temporary gravel service road on either side of a fence during construction of the fence. **(e)** A service road for access to an AIP eligible airside facility or NAVAID is eligible as part of that project or as a stand-alone project. **(2)** A service road that is otherwise eligible but provides incidental access to FAA or other non-aviation related areas or facilities is still considered eligible. **(3)** The difference between construct, expand, modify, improve, and rehabilitate is listed in Table P-1.		
c. Terminal People Mover (Construct, Expand, Modify, Improve, or Rehabilitate)	**(1)** Per FAA policy, terminal people movers are treated the same as access roads. As such, per 49 USC § 47102(28), terminal people movers are included in the definition of terminal development and must follow the terminal building funding rules in Table N-7. Stand-alone grants can be issued for these projects. **(2)** Light rail, monorail, and automated people mover systems used to transport passengers and	A fully functional airport people mover.	CA GT PM OT GT PM See Table P-2 for the correct work code.

Table P-3 Roads and Surface Transportation

What Can Be Done If Justified	Factors to Consider For Justification and Eligibility	Required Usable Unit of Work and Required Outcome	Work Code*
	baggage between terminals are considered eligible terminal people movers. **(3)** In addition, vehicles for moving passengers between terminal facilities and between terminal facilities and aircraft is specifically eligible as terminal development under 49 USC § 47102(28)(B). **(4)** Stations or stops must be on airport property and only for passenger access to the airport. **(5)** If any ineligible areas (examples of ineligible costs are listed in Appendix C) are included in the system's or station's design, the cost for the system and station must be prorated. The requirements for including ineligible or non-AIP funded work in the contract in Paragraph 3-39 must be met. **(6)** Extensive justification for an on-airport passenger transportation system is required. This justification must include a discussion of other alternatives. Any such project must be coordinated with APP-500. **(7)** The sponsor must include specific information describing the vehicle or equipment that is being acquired in the project description. **(8)** Per 49 USC § 47119(a)(1)(A), the airport has all safety equipment required for the airport per 49 USC § 44706 (Airport Operating Certificate), has all security equipment required by rule or regulation, and has provided for access by passenger to the area of the airport for boarding or exiting aircraft that are not air carrier aircraft.		

Table P-3 Roads and Surface Transportation

What Can Be Done If Justified	Factors to Consider For Justification and Eligibility	Required Usable Unit of Work and Required Outcome	Work Code*
	(9) The difference between construct, expand, modify, improve, and rehabilitate is listed in Table P-1.		
d. Access Rail (Construct, Expand, Modify, Improve, or Rehabilitate)	**(1)** Per FAA policy, access rails are treated the same as access roads. As such, per 49 USC § 47102(28), access rails are considered to be terminal development. Therefore, all funding restrictions for terminal development apply. **(2)** Public train service to an airport must meet the same eligibility criteria as airport access roads. The rail line must be limited to only serve passengers and employees traveling to and from the airport. **(3)** If any ineligible areas (examples of ineligible costs are listed in Appendix C) are included in the system's or station's design, the cost for the system and station must be prorated. The requirements for including ineligible or non-AIP funded work in the contract in Paragraph 3-39 must be met. **(4)** The difference between construct, expand, modify, improve, and rehabilitate is listed in Table P-1.	A fully functional access rail system.	CA GT RL OT GT RL See Table P-2 for the correct work code.

*The official list of work codes can be obtained from the automated AIP system.

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Appendix Q. Land Projects

Q-1. How to Use This Appendix.

This appendix is not a valid stand-alone document for making eligibility and justification determinations. The information in this appendix must be used in conjunction with the Handbook, especially the project cost requirements in Chapter 3.

Q-2. General Eligibility Requirements.

The acquisition of any interest in land is eligible when it is needed for *airport purposes*. Even though many infrastructure and construction elements are not eligible for AIP, the land they occupy is eligible for AIP funding if they meet this definition (see Appendix A).

The sponsor is responsible for maintaining adequate documentation to support costs as eligible for Federal reimbursement. A documentation checklist and quality control guidelines are provided in the current version of Advisory Circular 150/5100-17, Land Acquisition and Relocation Assistance for Airport Improvement Program Assisted Projects, and the current version of FAA Order 5100.37, Land Acquisition and Relocation Assistance for Airport Projects.

Q-3. Applicable Land Orders, Regulations, and Advisory Circulars.

When acquiring land for an AIP assisted project (AIP in any portion of the project) the airport owner must comply with 49 CFR part 24, Uniform Relocation Assistance and Real Property Acquisition for Federal and Federally-Assisted Programs. 49 CFR part 24 requirements are described in the current version of FAA Order 5100.37, Land Acquisition and Relocation Assistance for Airport Projects, and guidance for sponsor documentation and compliance is provided in the current version of Advisory Circular 150/5100-17, Land Acquisition and Relocation Assistance for Airport Improvement Program Assisted Projects. The airport owner must certify to the FAA its compliance to 49 CFR part 24 for any land acquired for an AIP funded airport project.

Q-4. Appraisal Requirement.

The cost of all AIP funded real property must be supported by a real estate appraisal, accepted settlement justification and evidence of good title to the acquired property. The FAA appraisal requirements are based on 49 CFR § 24.103. These requirements are described in the current version of FAA Order 5100.37, Land Acquisition and Relocation Assistance for Airport Projects, and in the current version of Advisory Circular 150/5100-17, Land Acquisition and Relocation Assistance for Airport Improvement Program Assisted Projects.

The fair market value of the land at the time of purchase must be used, not the current fair market value. The exception is for privately-owned airports, where 49 USC § 47109(d) requires that the current fair market value of the land at the time of the project be used.

Q-5. Good Title Requirements for Land and Easement Acquisition.

All AIP funded land and easement acquisition must meet the requirements for good title found in Table Q-1.

Table Q-1 Good Title Requirements for Land and Easement Acquisition

The following criteria apply…	
a.	The sponsor must acquire sufficient right, title and interest in the property to meet project requirements (e.g., construct, operate and maintain). Property interests required in off-airport areas must be sufficient to assure that the sponsor will not be deprived of its right to occupy and use such lands for the purposes intended.
b.	The sponsor must ensure marketable title to property is conveyed to the airport free and clear of any interest or encumbrance that may conflict with the project need and use of the property.
c.	Airport property title and airport interests in property must be recorded in the local public land records.
d.	The property title conveyed must be as appraised and agreed for the purchase.
e.	The sponsor's attorney must certify to ADO that good to title has been acquired.
f.	The attorney may rely on title insurance (title company commitment of insurance of marketable title), or title abstract or an attorney's certificate of title.

Q-6. Acceptable Land Interests.

The acceptable types of land interests that may be funded with AIP are listed in Table Q-2.

Table Q-2 Types of Land Interests

For the following type of land interest…	The following applies…
a. Fee Simple.	This is the preferred land interest for AIP funded projects.
b. Easements and Lesser Interests.	In some instances, a lesser property interest may be appropriate if the interest is legally sufficient for the purpose of the project or the acquisition is to a lesser property interest by a court order. For instance, it may be preferable to acquire an adequate easement for the transitional surface instead of the fee interest in the land. However, if the cost of a lesser interest, such as an easement, is nearly equivalent to the cost of fee simple interest, the sponsor must give priority to acquiring fee simple title. The ADO has an option to approve a lesser interest in such instances if the sponsor provides a valid and just reason acceptable to the ADO that substantiates the lesser interest. Additional guidance on easement terms and requirements is provided in the current version of Advisory Circular 150/5100-17, Land Acquisition and Relocation Assistance for Airport Improvement Program Assisted Projects.

Q-7. Logical Boundaries.

Where feasible, land may be acquired to a logical boundary, such as existing property lines and/or boundaries created by nature such as rivers and manmade development (highways, railroads, etc.).

Q-8. Uneconomic Remnants.

When a partial acquisition would leave the owner with an uneconomic remnant, as defined in 49 CFR part 24, the airport owner must offer to purchase the remnant.

Q-9. Disposal of Excess Land.

Occasionally, the sponsor may negotiate the purchase of more of a property than is required for the airport project (such as agreeing to a whole taking versus the needed partial take from the owner's property). In this case, AIP can be used to acquire the excess land. However, the airport sponsor must agree that it will promptly dispose of the excess land (per the requirements of Paragraph 5-68).

Q-10. Purchasing Land from a State/Local Public Agency.

The FAA must determine that land acquired from another public agency is, in fact, a bona fide sale to the sponsor, and that such land was not transferred merely for the purpose of making the land eligible for Federal funding.

Q-11. Project Requirements Tables.

In addition to the information provided in the above paragraphs and the following tables, Appendix C contains examples of prohibited projects and costs and is very useful to use alongside this appendix.

Table Q-3 Land Work Codes

If the project is for…	Use the following work codes…
a. Land or easement acquisition for a specific AIP eligible project.	The work code for the associated project
b. Land or easement acquisition for multiple AIP eligible projects.	ST LA DV (Acquire Land for Development) ST LA DV (Acquire Easement for Development)
c. Land acquisition for *airport purposes* (as defined in Appendix A) that are not AIP eligible.	ST LA MS (Acquire Miscellaneous Land)

Table Q-4 Land Project Requirements

What Can Be Done If Justified	Factors to Consider For Justification and Eligibility	Required Usable Unit of Work and Required Outcome	Work Code*
a. Acquire Land or Easements	**(1)** The acquisition must meet the requirements of 49 CFR part 24, the current version of FAA Order 5100.37, Land Acquisition and Relocation Assistance for Airport Projects, and in the current version of Advisory Circular 150/5100-17, Land Acquisition and Relocation Assistance for Airport Improvement Program Assisted Projects. **(2)** The land or easement must be needed for airport purposes (as defined in Appendix A) within the next 20 years. **(3)** For reimbursement of previously acquired land or easements, the land or easement can be currently used for existing airport purposes or be needed for airport purposes (as defined in Appendix A) within the next 20 years.	Sponsor owned land or easement with good title.	See Table Q-3 for the correct work code.

Table Q-4 Land Project Requirements

What Can Be Done If Justified	Factors to Consider For Justification and Eligibility	Required Usable Unit of Work and Required Outcome	Work Code*
	(4) The associated development must be shown on the FAA approved airport layout plan. **(5)** The sponsor must certify that the requirements of 49 CFR part 24 are being met. **(6)** The Exhibit A must be updated when the purchase is complete.		
b. Lease Publically Owned Land	**(1)** These are rare, so the ADO must contact APP-400 for guidance to ensure that all of the necessary requirements are being met. **(2)** The Federal government is not considered a public agency in this instance. **(3)** The lease must meet the requirements of 49 CFR part 24, the current version of FAA Order 5100.37, Land Acquisition and Relocation Assistance for Airport Projects, and in the current version of Advisory Circular 150/5100-17, Land Acquisition and Relocation Assistance for Airport Improvement Program Assisted Projects. **(4)** The lease must be between the sponsor and public agency (a state; a political subdivision of a state (such as a city, municipality, or state agency); a tax-supported organization; or an Indian tribe or pueblo). **(5)** The acquisition, easement, or other interest in the land is not available. **(6)** The lease negotiations must meet applicable requirements of 49 CFR part 24. If the sponsor cannot condemn the land, then the lease negotiations may be exempt from the provisions of 49 CFR part 24 as a voluntary	A long term lease that helps ensure adequate rights needed to operate the airport.	See Table Q-3 for the correct work code.

Table Q-4 Land Project Requirements

What Can Be Done If Justified	Factors to Consider For Justification and Eligibility	Required Usable Unit of Work and Required Outcome	Work Code*
	transaction (as described at 49 CFR § 24.101(b)(2)). **(7)** Prepaid rent, which is payment in full in advance for the full term of the lease, is eligible. The pre-paid rent must reflect the present value of the rent payments, not to exceed the current fair market value of the real property leased. **(8)** The lease term must exceed 20 years. This is because the lease term must be longer than the grant assurances for AIP construction projects. **(9)** Justification must include reason why the land is not to be acquired instead of leased. **(10)** Periodic rental or lease payments are not allowable. **(11)** The land must be needed for airport purposes (as defined in Appendix A) within the next 20 years. **(12)** The associated development must be shown on the FAA approved airport layout plan. **(13)** The sponsor must certify that the requirements of 49 CFR part 24 are being met. **(14)** The Exhibit A must be updated when the purchase is complete.		
c. Exchange Land or Easement	**(1)** These are rare, so the ADO must contact APP-400 for guidance to ensure that all of the necessary requirements are being met. **(2)** Appraisals must be completed for the sponsor owned land and the property to be acquired. **(3)** Both properties must be appraised. If one piece of property has a higher value, the	Sponsor owned land or easement with good title.	See Table Q-3 for the correct work code.

Table Q-4 Land Project Requirements

What Can Be Done If Justified	Factors to Consider For Justification and Eligibility	Required Usable Unit of Work and Required Outcome	Work Code*
	owner of that property must be offered the difference. **(4)** The ADO must issue a land release before the sponsor owned land can be exchanged. **(5)** The acquired land or easement must be needed for airport purposes (as defined in Appendix A) within the next 20 years. **(6)** The associated development must be shown on the FAA approved airport layout plan. **(7)** The sponsor must certify that the requirements of 49 CFR part 24 are being met. **(8)** The Exhibit A must be updated when the purchase is complete.		
d. Acquire Land or Easement for Approaches	**(1)** Land acquisition and easements for approaches are eligible for the following: **(a) Airport Design Advisory Circular Surfaces.** Approach surfaces in the current version of Advisory Circular 150/5300-13, Airport Design. There are many approach surfaces including, but are not limited to, obstacle free zones, threshold obstacle clearance surfaces, 14 CFR part 77 surfaces, and approach and departure surfaces. **(b) 14 CFR part 77 Surfaces.** Per FAA policy, obstructions to the 14 CFR part 77 primary approach and 7:1 transitional surfaces. **(c) TERPS.** Any of the United States Standard for Terminal Instrument Procedures (TERPS) requirements.	Sponsor owned land or easement with good title.	ST LA SZ

Table Q-4 Land Project Requirements

What Can Be Done If Justified	Factors to Consider For Justification and Eligibility	Required Usable Unit of Work and Required Outcome	Work Code*
	(2) Land acquisition and easements (to control land use on the property) for Runway Protection Zones are eligible per the current version of Advisory Circular 150/5300-13, Airport Design. **(3)** For approach protection, land acquisition and easement are limited to that necessary for the approach surfaces to obtain vertical clearance 100 feet above the elevation of the runway ends, but no more than 5,000 feet beyond the end of the runway. Beyond 5,000 feet from the runway end, it is expected that the airport sponsor will rely on local zoning and land use controls to protect approaches. **(4)** The Exhibit A must be updated when the purchase is complete. **(5)** For new acquisition, the land or easement must be needed within the next 20 years. **(6)** For reimbursement of previously acquired land or easements, the land or easement must currently be needed or must be needed within the next 20 years. **(7)** If the sponsor is purchasing an easement for approaches, it is preferable that the easement allows the sponsor to clear rather than top trees. This is because AIP can only be used to top the trees once and any future clearing on the property cannot be grant funded. The actual clearing or topping is funded under an obstruction removal projects. If the easement and obstruction removal is done at the same time, the entire project is coded as obstruction removal.		

Table Q-4 Land Project Requirements

What Can Be Done If Justified	Factors to Consider For Justification and Eligibility	Required Usable Unit of Work and Required Outcome	Work Code*
	(8) Rebuilding a facility in a new location is only eligible if the facility meets the requirements in Paragraph 3-74. **(9)** Obstruction removal within runway safety areas must meet the requirements and use the work codes in Appendix G. **(10)** Obstruction removal to support Area Navigation (RNAV) approaches is covered elsewhere in Appendix D and has a different work code.		
e. Acquire Land for Noise Compatibility	**(1)** The requirements for this type of land are contained in Appendix R.	N/A	N/A

*The official list of work codes can be obtained from the automated AIP system.

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Appendix R. Noise Compatibility Planning/Projects

R-1. How to Use This Appendix.

This appendix is not a valid stand-alone document for making eligibility and justification determinations. The information in this appendix must be used in conjunction with the Handbook, especially the project cost requirements in Chapter 3.

R-2. General Eligibility Requirements (The Four Types of Justification).

To be eligible, a noise compatibility project (also referred to as a noise mitigation project) must meet one of the following justification requirements in Table R-1.

Table R-1 General Eligibility Requirements for Noise Compatibility Projects

The noise compatibility project must be…
a. Included in an FAA approved 14 CFR part 150 Program. A noise compatibility project in an FAA approved 14 CFR part 150 Noise Compatibility Program (NCP). The Aviation Safety and Noise Abatement Act of 1979 (ASNA) directed the FAA to identify land uses that are normally compatible with various noise exposure levels. In response, the FAA adopted the 14 CFR part 150, Airport Noise Compatibility Planning. The adoption of the regulation was published in the 46 Federal Register 8316 (January 26, 1981). 14 CFR part 150 serves as the guidance for many of the AIP funded noise compatibility projects. 14 CFR part 150, Appendix A includes Table 1 - Land Use Compatibility with Yearly Day-Night Average Sound Levels that defines compatible and noncompatible land uses and related structures.
b. A Facility Used Primarily for Medical or Educational Purposes. A noise compatibility project for an adversely affected facility used primarily medical or educational purposes (per 49 USC § 47504(c)(2)(D), regardless if the airport has a 14 CFR part 150 program or not). Schools and hospitals are the most typical facilities that fall under this justification.
c. In a Land Use Compatibility Plan. A noise compatibility project that is included in a land use compatibility plan prepared by a local jurisdiction surrounding a medium or large hub airport that either has not prepared a 14 CFR part 150 program or has not updated 14 CFR part 150 program in the preceding 10 years. Per 49 USC § 47141(f), grants for projects approved under an FAA accepted compatible land use plan are only allowable until September 30, 2018. After this date, the ADO must check the current legislation to see if the sunset date was extended.
d. In a Record of Decision. A noise mitigation project approved in an environmental record of decision for an airport development project.

R-3. Noncompatible Land Uses.

Table 1 of Appendix A in 14 CFR part 150 contains the requirements for determining when various land uses are noncompatible with aircraft noise, and therefore potentially eligible for AIP funding.

R-4. Not all 14 CFR part 150 Measures are Eligible.

Not all of the projects included in an approved 14 CFR part 150 program are eligible for AIP funding. Examples of ineligible 14 CFR part 150 NCP measures are listed in Appendix C.

R-5. Reduction Due to Aircraft Noise Associated with the Airport.

Noise insulation projects are designed to reduce interior noise in habitable rooms or classroom areas due to *aircraft* noise associated with the airport (as further discussed in the current version of Advisory Circular 150/500-9, Announcement of Availability Report No. DOT/FAA/PP/92-5, Guidelines for the Sound Insulation of Residences Exposed to Aircraft Operations).

R-6. Eligible Noise Contour Threshold (or the Use of a Lower Local Standards).

The primary measurement of noise impact is the exterior noise measurement of cumulative yearly day-night average sound level (DNL), normally depicted as noise contours on a map. The noise contour is a graphical representation of the level of 24 hour average sound level in decibels for the period from midnight to midnight, obtained after the addition of ten decibels to sound levels for the periods between midnight and 7 a.m. and between 10 p.m. and midnight local time that is experienced by land uses surrounding the airport due to aircraft operations.

a. DNL 65 dB Noise Contour. The DNL 65 dB noise contour is the noise level at or above which certain land uses are not considered to be compatible (49 USC § 47502, as implemented by Table 1 of Appendix A in 14 CFR part 150). The converse is also true – because DNL 65 dB is the Federal threshold for considering certain land uses as compatible, noise-sensitive land uses located outside of the DNL 65 dB noise contour are not considered to be impacted by airport related noise. They are not eligible for mitigation funding unless a lower local standard is formally adopted.

b. Community Noise Exposure Level (CNEL). The FAA recognizes CNEL (community noise exposure level) as an alternative noise metric for California. For purposes of this Handbook the metric DNL and CNEL can be used interchangeably for projects in California.

c. Lower Local Standard. The FAA can consider a lower level of noise than the DNL 65 dB noise contour only if both the jurisdictions with land use authority surrounding the airport and the sponsor have each formally adopted a lower local standard (per a footnote to Table 1 of Appendix A in 14 CFR part 150, which reads in part, "The responsibility for determining the acceptable and permissible land uses and the relationship between specific properties and specific noise contours rests with the local authorities."). The ADO can contact APP-400 for further information on determining whether locally adopted noise contours may be considered a local standard in the 14 CFR part 150 study.

R-7. Required Validation of the Noise Exposure Maps.

Per 49 USC § 47503, the noise exposure maps that the sponsor submits to the FAA must reflect current or reasonably projected conditions. 49 USC § 47503(b) requires that sponsors update their noise exposure maps if there is a substantial increase or significant decrease in the noise contour over noncompatible land uses. 14 CFR part 150 defines a DNL 1.5 dB change or more

as substantial. The exception is for noise mitigation projects in an environmental record of decision for an airport development project.

In addition, the FAA requires by policy that if the FAA-accepted Noise Exposure Maps used to document project eligibility are more than five years old, sponsors must confirm in writing to the ADO that the noise exposure maps upon which noise compatibility projects are based continue to be a reasonable representation of current and/or forecast conditions at the airport. The ADO must verify whether or not the noise exposure map reflects the current or projected operational conditions at the airport and associated noncompatible land uses. The ADO must also place a copy of the sponsor confirmation and ADO verification in the grant file. The ADO must not program noise compatibility projects using noise exposure maps that are more than five years old unless this process has been completed.

R-8. Interior Noise Level Requirements.

The 45 dB standard has been adopted by the FAA for interior noise. This is based on 46 Federal Register 8316 (January 26, 1981), which established the interim rule for 14 CFR part 150 and included specific requirements regarding interior noise level. This was further clarified in 1992 by the Federal Interagency Committee on Noise (FICON) findings of 45 dB to be the interior noise level that will accommodate indoor conversations or sleep.

A noise-impacted noncompatible structure must be experiencing existing interior noise levels that are 45 dB or greater with the windows closed to be considered eligible. (For schools, the 45 dB measurement is based on the number of hours of the school day.)

The calculation of interior noise level must be based on the average noise level of only the habitable rooms or parts of school that are used for educational instruction. Habitable areas of residences are living, sleeping, eating or cooking areas (single family and multifamily) per the current version of Advisory Circular 150/5000-9, Announcement of Availability Report No. DOT/FAA/PP/92-5, Guidelines for the Sound Insulation of Residences Exposed to Aircraft Operations. Bathrooms, closets, halls, vestibules, foyers, stairways, unfinished basements storage or utility spaces are not considered to be habitable. For schools, noise insulation is limited to classrooms, libraries, fixed seat auditoriums, and educators' offices.

Areas that are not allowed under local building codes are not considered habitable. For example, a resident has converted part of a basement to a bedroom and the bedroom conversion does not meet the building code requirements to be categorized as a bedroom. The converted bedroom is not considered habitable space. For schools, areas that are used for incidental instruction, such as hallways, gymnasiums and cafeterias, are not eligible.

By policy, the FAA does not recognize a lower local standard below 45 dB for interior noise levels.

R-9. Block Rounding.

Per FAA policy, if sponsor proposes to expand noise mitigation just beyond the DNL 65 dB contour to include parcels contiguous to the project area (referred to as block rounding), the ADO has the option to approve this request if the requirements in Table R-2 are met.

Table R-2 Block Rounding Requirements

Requirements include…
a. DNL 65 dB Contour does not have a Reasonable End Point. The block rounding must be necessary to reach a reasonable end point for noise insulation projects.
b. Sponsor Provides a Detailed List of Residences. The sponsor must provide the ADO the proposed end point information, including a complete list of the specific residences (by address) that are proposed for block rounding.
c. Called Out on All Lists. On all other lists of residences, these residences must be noted as *included due to block rounding*.
d. ADO Determination. The ADO must review and either approve or disapprove including the proposed block rounding residences at part of the associated noise mitigation program or environmental study. The ADO must document the determination and place a copy of the determination in the grant file.
e. Logical Breakpoint. In determining the reasonable end point for noise insulation projects, the ADO must ensure that the end point is a logical breakpoint (such as a neighborhood boundary, significant arterial surface street, highway, river, other physical or natural barrier or feature) or whether the end point extends unreasonably beyond a natural break. Neighborhood or street boundary lines may help determine the reasonable number of additional properties.
f. Interior Noise Levels Qualify. Once a residence is approved for block rounding, its interior noise levels must meet the requirements in Paragraph R-8 in order for that particular residence to be eligible.
g. Not Applicable for Lower Local Standards. Residences that lie outside of an eligible lower local standard below DNL 65 dB (per Paragraph R-6) are not eligible for block rounding.

R-10. Neighborhood Equity.

A sponsor may consider the use of neighborhood equity when residences in the eligible noise contour threshold (per Paragraph R-6) that do not meet the interior noise level requirements are scattered among residences that do meet the interior noise level criteria. If sponsor proposes to use neighborhood equity provisions, the ADO has the option to approve this request if the requirements in Table R-3 are met.

Table R-3 Requirements for Neighborhood Equity

Requirements include…
a. In the Eligible Noise Contour Threshold. The residence must be in the eligible noise contour threshold (per Paragraph R-6).
b. Separate Package. The sponsor must develop a separate neighborhood equity package limited to improvements such as caulking, weather stripping, installation of storm doors or ventilation packages. The ADO must not approve the use of the standard noise insulation package for neighborhood equity residences.
c. Percent Participation Limit. Per FAA policy, the ADO must not approve neighborhood equity for more than 10% of the residences in the neighborhood, (as logically bounded by either streets or other geographic delineation) or 20 residences in a phase of the noise insulation program, whichever is less. Note that the FAA has determined that PFC and airport revenue cannot be used to fund any residences beyond this limit, because homes beyond this limit are not adversely affected by airport noise.
d. APP-1 Approval for Exceeding Percent Participation Limit. In extremely rare cases, ADO may determine that the program will benefit by providing noise equity packages to more than the 10%/no more than 20 residence limit. In this instance, the ADO must have received written APP-1 approval to exceed this limit.
e. Sponsor Provides a Detailed List of Residences. The sponsor must provide the ADO with a complete list of the specific residences (by address) that are proposed for neighborhood equity.
f. Sponsor Provides a Cost Comparison. The sponsor must provide the ADO with detailed information comparing the cost of the proposed neighborhood equity package with the cost of a standard noise insulation package.
g. ADO Determination. The ADO must review and approve or disapprove the sponsor's proposed neighborhood equity package. In their determination, the ADO must ensure that the use of the minimal neighborhood equity packages on non-eligible residences is required to allow successful completion of the overall noise insulation program in the neighborhood, thus allowing these residences to be noise insulated within the guidelines of AIP eligibility. The ADO must document the determination and place a copy of the determination in the grant file.

R-11. Pre- and Post-Testing Criteria for Noise Insulation Projects.

In order for a structure to be funded with AIP grant funding, the sponsor must follow the sampling and testing criteria listed in Table R-4.

Table R-4 Pre- and Post-Testing Criteria for Noise Insulation Projects

For the following…	The requirement is…
a. Published Guidance	**(1)** In 1992, the FAA adopted guidance on test sampling frequency and other statistical measures that can be applied to a neighborhood to estimate the interior noise levels in the residences that are in the 65 dB DNL contour. This information is compiled into the Acoustical Testing Plan. Long standing agency policy is that an airport sponsor must use the 1992 guidance to establish the existing interior noise levels to determine whether or not the building qualifies for sound insulation using AIP. The 1992 guidance is found in current version of Advisory Circular 150/5000-9, Announcement of Availability Report No. DOT/FAA/PP/92-5, Guidelines for the Sound Insulation of Residences Exposed to Aircraft Operations. **(2)** The 1992 guidance was written to cover a broad range of sound insulation topics. There are recommendations in the guidance that exceed what is justified under AIP. However, just because an item is discussed in the guidance, this does not make it eligible or justified. This Handbook, not the guidance, provides the guidance for determining eligibility and justification for any project that is AIP funded.
b. Sponsor Requirements for submitting Testing Protocol to the ADO	**(1)** The sponsor must submit the proposed testing protocol to the ADO. **(2)** The ADO has the option to review the testing protocol. **(3)** After ADO review or after the ADO has indicated that the testing protocol will not be reviewed, the sponsor will then noise insulate the residences in the testing phase.

Table R-4 Pre- and Post-Testing Criteria for Noise Insulation Projects

For the following…	The requirement is…
c. First Step – Initial Testing	**(1)** The first step of a noise insulation program is generally the initial testing phase. In this phase, the sponsor characterizes the neighborhood by characterizing the housing types, level of noise exposure (i.e., Location within the noise contour) and address. The sponsor must also describe the acoustical issues, number of residences to be tested and describe the acoustical criteria and testing methodology. **(2)** A sponsor starting a sound insulation program in a community near the airport will typically first conduct a windshield survey of the types of residences that are in the current phase. The windshield survey catalogs the types of residences in the neighborhood, notes similarities and differences in the age, construction type, size, number of levels, and types of housing (single family or multi-family). **(3)** Once the sponsor has characterized the diversity of the residences in the noise contour, it will select a representative sample of each type of similarly-constructed residences for testing, which based on industry review is typically 10% to 30%. Testing in this case means that the sponsor develops and installs a sound insulation package that the sponsor believes will reduce the interior noise level in the residence for each type of construction. **(4)** In a neighborhood where the residences are made of either brick or wood siding, the sponsor will develop two different packages – one for the brick residences and one for the siding residences. **(5)** The sponsor will then measure the interior noise levels and prepare a summary report detailing the effectiveness of the design package, make recommendations for any changes to the package, lists the before and after interior noise level data, and submits the package to the ADO. **(6)** Reimbursement for initial and subsequent phase testing is limited to 10% of the residences of a particular type unless the sponsor has provided the justification for the request to the ADO and the ADO has approved the request. **(7)** The ADO must approve or disapprove a sponsor request for reimbursement for testing more than 10%, but not more than 30%, of the residences of a particular construction type. The ADO may request APP-400 assistance in evaluating sponsor requests. A copy of the sponsor's written request and the ADO approval or disapproval must be kept in the grant file. **(8)** For requests for reimbursement for more than 30% of the residences of a particular type, the ADO must have received APP-400 approval. The request to APP-400 from the ADO must contain the sponsor's justification for the request and the ADO's recommendation for approval or disapproval.

Table R-4 Pre- and Post-Testing Criteria for Noise Insulation Projects

For the following…	The requirement is…
d. Second Step - ADO and Sponsor Review of Initial Testing Results	**(1)** The sponsor must review the results to determine if there is a need to test additional residences. **(2)** The ADO has the option to review and approve or disapprove all sponsor revisions to the sampling program.
e. Special Circumstance – Resident Requests Specific Testing	**(1)** A resident may request that their residence be tested specifically. This may be because of the condition of the home, or because the resident believes that their residence will test differently than others. These additional tests are generally allowable. However, if an additional residence is tested, it must be tested both before and after any noise insulation work to ensure the 5 dB NLR is achieved.
f. Final Step – Completing the Testing Phase	**(1)** After the completion of the testing phase, the sound insulation program will begin for the neighborhood. In these later phases, the sponsor is still expected to test from 10% to 30% of each different category of residences in the phase to revalidate the design assumptions. The results of the revalidation testing must be submitted by the sponsor to the ADO. The ADO has the option to review these test reports.

R-12. Conditions for Posting Planning Documents on the Internet.

If the sponsor, or a sponsor's consultant, posts an AIP funded planning document on the internet, it is FAA policy that the public must not be required to register to view or download the document (even if the document is posted elsewhere without registration requirements). This is because the collection of personal data may be construed by the public as a surveillance tool for the airport, which may intimidate members of the public, dissuading them from reviewing the document. In addition 5 USC § 552a(e), The Privacy Act of 1974, prohibits the unnecessary collection of private data by Federal agencies by restricting the agency to maintain only such information about an individual as is relevant and necessary to accomplish the purpose.

R-13. Disposal of Excess/Unneeded AIP Funded Noise Land (and ADO/Sponsor Tracking).

The requirements for the disposal of excess or unneeded AIP funded noise land are contained in Paragraph 5-68.

R-14. Project Requirements Tables.

In addition to the information provided in the above paragraphs and tables, and the following tables, Appendix C contains examples of prohibited projects and costs and is very useful to use alongside this appendix.

Table R-5 Noise Compatibility Planning/Project Work Codes

If the noise mitigation planning and implementation project is defined by where it is in the DNL, and is…	Use the following work codes…
Outside the 65 DNL.	XX XX 60
Within the 65 – 69 DNL.	XX XX 65
Within the 70 – 74 DNL.	XX XX 70
Within the 75 DNL.	XX XX 75

Table R-6 Noise Compatibility Planning/Project Requirements

What Can Be Done If Justified	Factors to Consider For Justification and Eligibility	Required Usable Unit of Work and Required Outcome	Work Code*
a. Conduct Noise Compatibility Program Study *(14 CFR part 150 Study)*	**(1)** The study and noise exposure maps must comply with the requirements of 14 CFR part 150.	An FAA approved noise compatibility program study and FAA accepted noise exposure maps.	EN PL NO
b. Conduct Noise Compatibility Plan Study *(Stand-Alone Noise Exposure Map Update)*	**(1)** The noise exposure map (NEM) update must comply with the requirements of 14 CFR § 150.21(d). **(2)** Per 14 CFR § 150.21(a)(1), the noise exposure levels must be based on forecast aircraft operations at the airport for a forecast period that is at least five years in the future beginning at the date of sponsor submission. **(3)** The sponsor must submit the updated noise exposure map to the ADO for FAA review. **(4)** The FAA must complete the required notice and comment in the Federal Register (this is a requirement in 14 CFR § 150.21(c)) **(5)** The sponsor must evaluate the impact of the updated NEMs against the existing noise compatibility program (NCP).	New FAA accepted noise exposure maps.	EN PL NO

Table R-6 Noise Compatibility Planning/Project Requirements

What Can Be Done If Justified	Factors to Consider For Justification and Eligibility	Required Usable Unit of Work and Required Outcome	Work Code*
	Note: This is not a complete update of the Record of Approval and NCP – rather this is an evaluation of whether the work items in the NCP are still valid. **(6)** The sponsor must submit the results of the evaluation to the ADO. The ADO must include the sponsor's evaluation in the grant file. **(7)** If, in the opinion of the FAA, the changes in the NCP impact are extensive, the FAA has the option to require an update to the NCP.		
c. Conduct Noise Compatibility Plan Study (Compatible Land Use Plan by State and Local Governments per 49 USC § 47141)	**(1)** The compatible land use planning is for an area around a large or medium hub airport. **(2)** The airport has not submitted an airport noise compatibility program to the FAA under 14 CFR part 150, or has not updated its approved noise compatibility program within the preceding 10 years. **(3)** The state or local government sponsor and airport have entered into a written agreement to prepare the compatible land use plan cooperatively (prior to the grant being issued). **(4)** The state or local government sponsor must maintain compatible land use measures listed in the completed plan. **(5)** The land use plan will be reasonably consistent with the goal of reducing existing non-compatible land uses and preventing the introduction of additional non-compatible land uses per 14 CFR part 150. **(6)** The land use plan will only include measures that are within the authority of the state or local	An FAA accepted (and airport approved) compatible land use plan with a capital improvement plan containing the plan measures.	EN PL NO

Table R-6 Noise Compatibility Planning/Project Requirements

What Can Be Done If Justified	Factors to Consider For Justification and Eligibility	Required Usable Unit of Work and Required Outcome	Work Code*
	government sponsor to implement. Measures such as studying or implementing aircraft operational procedures, airport layout changes, and airport noise and access restrictions must not be included because the state or local government sponsor has no authority to carry out these measures. **(7)** The airport must provide the state or local government sponsor with valid airport noise exposure maps and all noise abatement measures adopted by the airport. The airport must certify to the state or local government sponsor and the FAA that the noise exposure maps are representative of the current conditions at the airport. The state or local government sponsor must use this information when developing the land use plan. **(8)** The land use plan must not duplicate and must be consistent with all of the airport's noise compatibility measures for the same area. **(9)** The state or local government sponsor must include evidence of public involvement in the land use plan. **(10)** The state or local government sponsor must make provisions to implement those elements of the plan that are ineligible for Federal financial assistance. **(11)** Per 49 USC § 47141(f), these types of grants are only allowable until September 30, 2018. After this date, the ADO must check the current legislation to see if the sunset date was extended.		

Table R-6 Noise Compatibility Planning/Project Requirements

What Can Be Done If Justified	Factors to Consider For Justification and Eligibility	Required Usable Unit of Work and Required Outcome	Work Code*
d. Noise Mitigation *(Required by an Environmental Record of Decision)*	**(1)** Noise mitigation projects approved in an environmental record of decision for an AIP eligible project is an allowable cost (or phase) of the AIP eligible project per Paragraph R-2.	A noise mitigation measure that meets the requirements of the record of decision.	The work code of the associated AIP eligible project must be used
e. Acquire Land for Noise Compatibility *(To Change Land Use)*	**(1)** The project must be included in an FAA approved 14 CFR part 150 program or an FAA accepted compatible land use plan. **(2)** The land must be included on the Noise Land Inventory Map and the Noise Land Reuse Plan. Noise Land Management and Requirements for Disposal of Noise Land or Development Land Funded with AIP (see Appendix B for link) contains guidance for these plans. **(3)** Per 49 USC § 47141(f), grants for projects approved under an FAA accepted compatible land use plan are only allowable until September 30, 2018. After this date, the ADO must check the current legislation to see if the sunset date was extended. **(4)** The project must be within the DNL 65 dB noise contour unless a lower local standard has been formally adopted. **(5)** The requirements for interior noise do not apply to acquisition projects. **(6)** The project may include residential relocation. **(7)** The sponsor must provide the ADO with the number of people that have benefited. **(8)** The acquisition must meet the requirements of 49 CFR part 24,	Sponsor owned land with good title that will allow the sponsor to clear the noncompatible land use.	EN LA 60 EN LA 65 EN LA 70 EN LA 75 See Table R-5 for correct work code

Table R-6 Noise Compatibility Planning/Project Requirements

What Can Be Done If Justified	Factors to Consider For Justification and Eligibility	Required Usable Unit of Work and Required Outcome	Work Code*
	the current version of FAA Order 5100.37, Land Acquisition and Relocation Assistance for Airport Projects, and the current version of Advisory Circular 150/5100-17, Land Acquisition and Relocation Assistance for Airport Improvement Program Assisted Projects. **(9)** The sponsor must certify that the requirements of 49 CFR part 24 are being met. **(10)** The acquisition must meet all other applicable requirements in Appendix Q. **(11)** The project must meet the general eligibility requirements in Paragraph R-2.		
f. Acquire Easement for Noise Compatibility *(No Change in Land Use)*	**(1)** The project must be included in an FAA approved 14 CFR part 150 program or an FAA accepted compatible land use plan. **(2)** Per 49 USC § 47141(f), grants for projects approved under an FAA accepted compatible land use plan are only allowable until September 30, 2015. After this date, the ADO must check the current legislation to see if the sunset date was extended. **(3)** The project must be within the DNL 65 dB noise contour unless a lower local standard has been formally adopted. **(4)** An easement may be conveyed by the property owner in exchange for the sound insulation improvements provided. However, an AIP grant may not include a requirement that a property owner convey an easement (or other interest in the property) to the sponsor in	A sponsor owned easement with good title.	EN LA 60 EN LA 65 EN LA 70 EN LA 75 See Table R-5 for correct work code

Table R-6 Noise Compatibility Planning/Project Requirements

What Can Be Done If Justified	Factors to Consider For Justification and Eligibility	Required Usable Unit of Work and Required Outcome	Work Code*
	exchange for sound insulation. The FAA encourages sponsors to work out such voluntary property agreements locally. **(5)** The acquisition must meet the requirements of 49 CFR part 24, the current version of FAA Order 5100.37, Land Acquisition and Relocation Assistance for Airport Projects, and the current version of Advisory Circular 150/5100-17, Land Acquisition and Relocation Assistance for Airport Improvement Program Assisted Projects. **(6)** The sponsor must certify that the requirements of 49 CFR part 24 are being met. **(7)** The acquisition must meet all other applicable requirements in Appendix Q. **(8)** The project must meet the general eligibility requirements in Paragraph R-2.		
g. Noise Mitigation Measures for Residences *(Full Sound Insulation Package)*	**(1)** The project must be included in an FAA approved 14 CFR part 150 program or an FAA accepted compatible land use plan. **(2)** Per 49 USC § 47141(f), grants for projects approved under an FAA accepted compatible land use plan are only allowable until September 30, 2018. After this date, the ADO must check the current legislation to see if the sunset date was extended. **(3)** The project must meet the two-stage eligibility test. First the property must be in an eligible noise contour threshold (per Paragraph R-6) and second, the property must meet the interior	A residence that has been mitigated to 14 CFR part 150 requirements.	EN HO 60 EN HO 65 EN HO 70 EN HO 75 See Table R-5 for correct work code.

Table R-6 Noise Compatibility Planning/Project Requirements

What Can Be Done If Justified	Factors to Consider For Justification and Eligibility	Required Usable Unit of Work and Required Outcome	Work Code*
	noise level requirement (per Paragraph R-8). **(4)** The sound insulation package must provide a reduction in indoor noise level of at least 5 dB and bring the average interior noise level below 45 dB. If for any reason the sponsor believes that the 5 dB reduction cannot be achieved, the sponsor must provide a written request to the ADO. The ADO must receive APP-1 concurrence to proceed with the work. APP-1 concurrence will generally be limited to ventilation packages, cases of neighborhood equity or for older or poorly maintained residences where the 5 dB reduction may be difficult to achieve. **(5)** The sponsor must follow the sampling and testing criteria listed in Paragraph R-11. **(6)** The following measures are allowable: window and door replacement, caulking, weather-stripping, and installing central air ventilation so that the windows can be kept closed only if the structure does not already have a central air ventilation system. The use of other measures is not allowable unless the ADO has approved the use of the measures in advance. In this case, the ADO must keep a copy of the sponsor's request for use of other measures and a copy of the ADO approval of the request in the grant file. Eligibility is limited to the measures listed above unless the ADO has received approval from APP-400 and APP-500 to use other measures.		

Table R-6 Noise Compatibility Planning/Project Requirements

What Can Be Done If Justified	Factors to Consider For Justification and Eligibility	Required Usable Unit of Work and Required Outcome	Work Code*
	(7) The structure must have been built prior to October 1, 1998 unless the sponsor has demonstrated to the ADO that no published noise contours existed at that time. New noncompatible land uses created by subsequent airport development may also be eligible for funding consideration. The October 1, 1998 date is based on the FAA Final Policy on Part 150 Approval of Noise Mitigation Measures: Effect on the Use of Federal Grants for Noise Mitigation Projects, 63 Federal Register 16409 (April 3, 1998). **(8)** An easement may be conveyed by the property owner in exchange for the sound insulation improvements provided. However, an AIP grant may not include a requirement that a property owner convey an easement (or other interest in the property) to the sponsor in exchange for sound insulation. The FAA encourages sponsors to work out such voluntary property agreements locally, exclusive of FAA grant stipulations. **(9)** Both single and multi-family residences, including apartment buildings, are eligible. **(10)** The sponsor must provide the ADO with the number and address of homes mitigated and the number of people that have benefited. **(11)** Additional guidance is provided in the current version of Advisory Circular 150/5000-9, Announcement of Availability Report No. DOT/FAA/PP/92-5, Guidelines for the Sound		

Table R-6 Noise Compatibility Planning/Project Requirements

What Can Be Done If Justified	Factors to Consider For Justification and Eligibility	Required Usable Unit of Work and Required Outcome	Work Code*
	Insulation of Residences Exposed to Aircraft Operations. **(12)** Permanent Modular Buildings. Some modular structures may be classified as permanent if they meet construction guidelines applied to permanent structures. **(13)** The project must meet the general eligibility requirements in Paragraph R-2.		
h. Noise Mitigation Measures for Residences *(Positive Ventilation Package Only)*	**(1)** The residence must not have continuous positive ventilation and when tested, must demonstrate interior noise levels less than 45 dB. **(2)** Because the interior noise measurements are conducted with "windows closed", there may be situations where a residence does not have an existing ventilation system, but relies on keeping the windows open for air circulation. **(3)** A Continuous Positive Ventilation System is the allowable package for these residences. The sponsor must also provide detailed information about the ventilation package including costs of the package compared to the cost of a standard noise insulation package. The sponsor may recommend an air conditioning system in lieu of ventilation- only. **(4)** Because a ventilation system is likely to increase utility and maintenance costs for the residence, the sponsor must provide information about utility and maintenance costs for the installed equipment to the residence owners.	A residence that has been mitigated to 14 CFR part 150 requirements.	EN HO 60 EN HO 65 EN HO 70 EN HO 75 See Table R-5 for correct work code.

Table R-6 Noise Compatibility Planning/Project Requirements

What Can Be Done If Justified	Factors to Consider For Justification and Eligibility	Required Usable Unit of Work and Required Outcome	Work Code*
	(5) This package is limited to those structures that do not have an existing continuous positive ventilation system. It is not available to structures that have an existing continuous positive ventilation system in place even if the system is inoperable, older, or does not meet the current building code standards for air exchanges. **(6)** The project must meet the general eligibility requirements in Paragraph R-2.		
i. Noise Mitigation Measures for Public Buildings *(Full Sound Insulation Package)*	**(1)** The project must meet the two-stage eligibility test. First the property must be in an eligible noise contour threshold (per Paragraph R-6) and second, the property must meet the interior noise level requirement (per Paragraph R-8). **(2)** The sound insulation package must provide a reduction of at least 5 dB and bring the average interior noise level below 45 dB. Depending on the pre-insulation noise measurements, the 5 dB reduction may result in an interior noise level that is less than 45 dB. If for any reason the sponsor believes that the 5 dB reduction cannot be achieved, the sponsor must provide a written request to the ADO. The ADO must receive APP-1 concurrence to proceed with the work. APP-1 concurrence will generally be limited to ventilation packages and cases of neighborhood equity or for older or poorly maintained residences where the 5 dB reduction may be difficult to achieve.	A public building that has been mitigated to 14 CFR part 150 requirements.	EN PB 60 EN PB 65 EN PB 70 EN PB 75 See Table R-5 for correct work code

Table R-6 Noise Compatibility Planning/Project Requirements

What Can Be Done If Justified	Factors to Consider For Justification and Eligibility	Required Usable Unit of Work and Required Outcome	Work Code*
	(3) The sponsor must follow the sampling and testing criteria listed in Paragraph R-11. **(4)** The following measures are allowable: window and door replacement, caulking, weather-stripping, and installing central air ventilation so that the windows can be kept closed only if the structure does not already have a central air ventilation system. The use of other measures is not allowable unless the ADO has approved the use of the measures in advance. In this case, the ADO must keep a copy of the sponsor's request for use of other measures and a copy of the ADO approval of the request in the grant file. Eligibility is limited to the measures listed above unless the ADO has received approval from APP-400 and APP-500 to use other measures. **(5)** For schools, only the actual educational areas are eligible. This normally only includes classrooms, libraries, fixed seat auditoriums, and school educator's offices. The ADO must contact APP-400 for guidance on eligibility for facilities or areas beyond those specifically listed here. Appendix C includes some areas that have previously been determined to be ineligible. **(6)** The structure must have been built prior to October 1, 1998 unless the sponsor has demonstrated to the ADO that no published noise contours existed at that time. New noncompatible land uses created by subsequent airport development may also be eligible for funding consideration. The October 1, 1998 date is		

Table R-6 Noise Compatibility Planning/Project Requirements

What Can Be Done If Justified	Factors to Consider For Justification and Eligibility	Required Usable Unit of Work and Required Outcome	Work Code*
	based on the FAA Final Policy on Part 150 Approval of Noise Mitigation Measures: Effect on the Use of Federal Grants for Noise Mitigation Projects, 63 Federal Register 16409 (April 3, 1998). **(7)** Permanent Modular Buildings. Some modular structures may be classified as permanent if they meet construction guidelines applied to permanent structures. **(8)** The sponsor must certify to the ADO that the engineering plans and specifications for the noise insulation project conform to the local building code. **(9)** Only the costs related to the noise insulation improvements are included in the project. If it is determined in the course of designing a noise insulation project that a building needs improvements in order to conform to local building codes, only the costs of the noise insulation are allowable. **(10)** An easement may be conveyed by the property owner in exchange for the sound insulation improvements provided. However, an AIP grant may not include a requirement that a property owner convey an easement (or other interest in the property) to the sponsor in exchange for sound insulation. The FAA encourages sponsors to work out such voluntary property agreements locally, exclusive of FAA grant stipulations. **(11)** The sponsor must provide the ADO with the number of students benefitting.		

Table R-6 Noise Compatibility Planning/Project Requirements

What Can Be Done If Justified	Factors to Consider For Justification and Eligibility	Required Usable Unit of Work and Required Outcome	Work Code*
	(12) The project must meet the general eligibility requirements in Paragraph R-2.		
j. Noise Mitigation Measures for Public Buildings *(Positive Ventilation Package Only)*	**(1)** The building must not have continuous positive ventilation and when tested, must demonstrate interior noise levels less than 45 dB. **(2)** Because the interior noise measurements are conducted with "windows closed," there may be situations where a public building does not have an existing ventilation system, but relies on keeping the windows open for air circulation. **(3)** A Continuous Positive Ventilation System is the allowable package for these building. The sponsor must also provide detailed information about the ventilation package including costs of the package compared to the cost of a standard noise insulation package. The sponsor may recommend an air conditioning system in lieu of ventilation- only. **(4)** This package is limited to those structures that do not have an existing continuous positive ventilation system. It is not available to structures that have an existing continuous positive ventilation system in place even if the system is inoperable, older, or does not meet the current building code standards for air exchanges. **(5)** This package is limited to only those areas that are being noise insulated in the public building. **(6)** The project must meet the general eligibility requirements in Paragraph R-2.	A public building that has been mitigated to 14 CFR part 150 requirements.	EN PB 60 EN PB 65 EN PB 70 EN PB 75 See Table R-5 for correct work code

Table R-6 Noise Compatibility Planning/Project Requirements

What Can Be Done If Justified	Factors to Consider For Justification and Eligibility	Required Usable Unit of Work and Required Outcome	Work Code*
k. Install Outdoor Noise Monitoring System/Equipment *(Portable Noise Monitoring System and Equipment*	**(1)** The project must be included in an FAA approved 14 CFR part 150 Noise Compatibility Program or an FAA accepted compatible land use plan. **(2)** Per 49 USC § 47141(f), grants for projects approved under an FAA accepted compatible land use plan are only allowable until September 30, 2018. After this date, the ADO must check the current legislation to see if the sunset date was extended. **(3)** Non-airport sponsors are only eligible for portable noise monitoring equipment when used in connection with noise insulation projects managed by the non-airport sponsors. **(4)** In cases where more than one sponsor is expected to engage in noise insulation programs, the airport sponsor is encouraged to acquire the equipment and make it available to other local agencies as needed. **(5)** The system can be replaced every 10 years (the useful life). **(6)** Portable outdoor noise monitors must be used for carrying out/certifying approved noise mitigation measures. This typically includes periodic short-term noise monitoring of aircraft operations at the airport for the purposes of reporting the results as described in an approved 14 CFR part 150 program management measure. This also means that purpose for the outdoor noise monitors cannot be for enforcement of noise rules.	A completely operational portable outdoor noise monitoring system that meets the requirements of 14 CFR part 150.	EN OT NO

Table R-6 Noise Compatibility Planning/Project Requirements

What Can Be Done If Justified	Factors to Consider For Justification and Eligibility	Required Usable Unit of Work and Required Outcome	Work Code*
	(7) The sponsor must provide the ADO copies of noise monitoring data on request. **(8)** Monitoring systems are limited to outdoor monitoring systems. **(9)** Only the Federal share of the least costly system that will satisfy the purposes used to justify the project is eligible. The ability to track 100% of flights and/or real time display of flight tracks is beyond the functionality necessary to meet the purposes of noise monitoring. **(10)** The data ownership must remain with the sponsor, not the vendor. **(11)** The sponsor is responsible for ongoing vendor service costs that may be needed to access FAA surveillance tracking data. **(12)** The project must meet the general eligibility requirements in Paragraph R-2.		
l. Install Noise Monitoring System/Equipment *(Fixed Noise Monitoring System and Equipment)*	**(1)** The project must be included in an FAA approved 14 CFR part 150 program or an FAA accepted compatible land use plan. **(2)** Per 49 USC § 47141(f), grants for projects approved under an FAA accepted compatible land use plan are only allowable until September 30, 2018. After this date, the ADO must check the current legislation to see if the sunset date was extended. **(3)** Systems are limited to circumstances where sponsors can clearly show that portable monitors are not feasible. **(4)** Placement of fixed noise monitoring equipment is eligible	A completely operational fixed noise monitoring system that provides regular reporting of noise events.	EN OT NO

Table R-6 Noise Compatibility Planning/Project Requirements

What Can Be Done If Justified	Factors to Consider For Justification and Eligibility	Required Usable Unit of Work and Required Outcome	Work Code*
	only within the DNL 65 dB noise contour at the time of installation. **(5)** Only the Federal share of the least costly system that will satisfy the purposes used to justify the project is eligible. The ability to track 100% of flights and/or real time display of flight tracks is beyond the functionality necessary to meet the purposes of noise monitoring. **(6)** The data ownership must remain with the sponsor, not the vendor. **(7)** The sponsor is responsible for ongoing vendor service costs that may be needed to access real-time FAA surveillance tracking data. **(8)** The system can be replaced every 10 years (the useful life). **(9)** Monitoring results must be in accordance with the approved 14 CFR part 150 program or compatible land use program measure. **(10)** The sponsor must provide the ADO copies of noise monitoring data on request. **(11)** The project must meet the general eligibility requirements in Paragraph R-2.		
m. Noise Mitigation Measures *(On-Airport Noise Barriers)*	**(1)** The project must be approved in a 14 CFR part 150 program. **(2)** Noise barriers, earth berms, wall structures, hush houses, ground run-up enclosures and other devices designed to shield land uses that are noncompatible with aircraft noise are eligible. **(3)** The on-airport noise barrier must be public-use (not exclusive use by any specific aircraft operator).	A fully functional noise reduction structure that meets the requirements of 14 CFR part 150.	EN OT MS

Table R-6 Noise Compatibility Planning/Project Requirements

What Can Be Done If Justified	Factors to Consider For Justification and Eligibility	Required Usable Unit of Work and Required Outcome	Work Code*
	(4) The project must reduce noise to a land use noncompatible with aircraft noise by at least 5 dB. **(5)** The project must not impact wingtip clearances or air traffic control tower line of sight. **(6)** The project must meet the general eligibility requirements in Paragraph R-2.		
n. Noise Mitigation Measures *(Runway and Taxiway Construction)*	**(1)** These are rare, so the ADO must contact APP-400 for guidance to ensure that all of the necessary requirements are being met. **(2)** The project must be approved in a 14 CFR part 150 program. **(3)** A runway or taxiway project (including land acquisition, lighting, marking, and/or NAVAIDs) is eligible as a noise mitigation measure if it can be shown that the principal purpose and benefit of the project is for noise relief. If the noise relief is a secondary benefit, the FAA will not approve the project as a noise mitigation measure, and the project must meet the normal eligibility requirements for a runway or taxiway project. **(4)** Lighting and NAVAIDs for noise must be used for the purpose of directing pilots to follow noise abatement flight paths and must be associated with a noise abatement runway. **(5)** The project must meet the general eligibility requirements in Paragraph R-2.	An airfield or NAVAID installation that meets FAA design standards.	EN OT MS
o. Conduct Environmental Study for Flight Procedures Approved in a	**(1)** The requirements for environmental studies for flight procedure approvals are provided in Appendix S.	N/A	N/A

Table R-6 Noise Compatibility Planning/Project Requirements

What Can Be Done If Justified	Factors to Consider For Justification and Eligibility	Required Usable Unit of Work and Required Outcome	Work Code*
14 CFR part 150 Study			

*The official list of work codes can be obtained from the automated AIP system.

Appendix S. Environmental Planning/Mitigation Projects

S-1. How to Use This Appendix.

This appendix is not a valid stand-alone document for making eligibility and justification determinations. The information in this appendix must be used in conjunction with the Handbook, especially the project cost requirements in Chapter 3.

S-2. Conditions for Posting Planning Documents on the Internet.

If the sponsor, or a sponsor's consultant, posts an AIP funded planning document on the internet, it is FAA policy that the public must not be required to register to view or download the document (even if the document is posted elsewhere without registration requirements). This is because the collection of personal data may be construed by the public as a surveillance tool for the airport, which may intimidate members of the public, dissuading them from reviewing the document. In addition 5 USC § 552a, The Privacy Act of 1974, prohibits the unnecessary collection of private data by Federal agencies by restricting the agency to maintain only such information about an individual as is relevant and necessary to accomplish the purpose.

S-3. Project Requirements Tables.

In addition to the information provided in the above paragraphs and the following tables, Appendix C contains examples of prohibited projects and costs and is very useful to use alongside this appendix.

Table S-1 Environmental Planning/Mitigation Project Requirements

What Can Be Done If Justified	Factors to Consider For Justification and Eligibility	Required Usable Unit of Work and Required Outcome	Work Code*
a. Conduct Environmental Study	**(1)** The project must follow the requirements of the current version of FAA Order 5050.4, National Environmental Policy Act (NEPA) Implementing Instructions for Airport Projects. **(2)** Environmental Assessments (EA) and Environmental Impact Statements (EIS) must be coded separately from the proposed project (EN PL MA). The one exception is if such a study or assessment is less than $25,000, in which case it can then be coded under the proposed project. **(3)** This work code is used for a study that analyzes a specific environmental condition at an airport. An example is an emissions analysis necessary to comply with the Clean Air Act (42 USC § 7401). **(4)** This work code is also used for an environmental assessment for the development that is in the airport's capital improvement plan in the next five-years. **(5)** Per FAA policy, environmental assessments and environmental impact statements are considered to be planning. This allows the ADO to issue a stand-alone grant for an environmental study.	A completed environmental study that has been approved by the FAA.	EN PL MA

Table S-1 Environmental Planning/Mitigation Project Requirements

What Can Be Done If Justified	Factors to Consider For Justification and Eligibility	Required Usable Unit of Work and Required Outcome	Work Code*
b. Conduct Environmental Study for Flight Procedures Approved in a 14 CFR part 150 Study	**(1)** Per 49 USC § 47504(e)(1), the project must be for the FAA to complete an environmental review for flight procedures that have been approved by the FAA in a noise compatibility plan study (14 CFR part 150 study). **(2)** Until specific guidance is published by APP-400, ADOs must contact APP-400 to determine the correct procedures for conducting these studies.	A completed environmental study that has been approved by the FAA.	EN PL NO
c. Conduct/Update Miscellaneous Study *(Environmental Management System)*	**(1)** 49 USC § 47102(5)(B), makes development of an environmental management system (EMS) eligible as airport planning. **(2)** The airport must be a medium or large hub airport. **(3)** Only the initial development of the environmental management program is eligible. **(4)** Per FAA policy, the sponsor must provide a written certification to the ADO at the end of the project that the EMS is compliant with the current version of Advisory Circular 150/5050-8, Environmental Management Systems for Airport Sponsors.	A completed environmental management system document that meets FAA advisory circular requirements.	PL PL MS
d. Conduct/Update Miscellaneous Study *(Conduct Drainage Study)*	**(1)** 49 USC § 47102, makes construction, reconstruction, repair or purchasing capital equipment for meeting the requirements of 33 USC § 1251, Federal Water Pollution Control Act eligible. A drainage study may be required to determine the means of complying with this Act.	A completed drainage study that is acceptable to the ADO.	PL PL MS

Table S-1 Environmental Planning/Mitigation Project Requirements

What Can Be Done If Justified	Factors to Consider For Justification and Eligibility	Required Usable Unit of Work and Required Outcome	Work Code*
e. Conduct Airport Energy Efficiency Assessment	**(1)** Per 49 USC § 47140a(a), the project must assess the airport's energy requirements, including heating and cooling, base load, back-up power, and power for on-road airport vehicles and ground support equipment, for the purpose of identifying opportunities to increase energy efficiency at the airport. **(2)** As of the publication date of this Handbook, APP-400 was developing guidance for airport energy efficiency assessments. Until this new guidance is published, ADOs must contact APP-400 for guidance. **(3)** The ADO must coordinate all proposed projects with APP-400 and receive their approval for the project prior to programming the grant. **(4)** It is FAA policy that airport energy efficiency studies are airport planning and are eligible for stand-alone grants. **(5)** There is a limit of one assessment per five year period, unless the APP-400 concurs with an ADO determination that extraordinary circumstances exist that warrant an additional assessment.	A completed airport energy efficiency study that is acceptable to the ADO.	EN PL ES

Table S-1 Environmental Planning/Mitigation Project Requirements

What Can Be Done If Justified	Factors to Consider For Justification and Eligibility	Required Usable Unit of Work and Required Outcome	Work Code*
f. Energy Efficiency Equipment/ Infrastructure	**(1)** A completed airport energy efficiency assessment that is acceptable to the ADO is a prerequisite for these projects. **(2)** As of the publication date of this Handbook, APP-400 was developing guidance for projects to increase the energy efficiency of airport *power sources*. Until this new guidance is published, the ADO and regional office must contact APP-400 for project information prior to programming the grant. **(3)** Additional guidance and requirements for this program are contained in Section 7 of Chapter 6. **(4)** These grants are only for airport power sources discussed in Section 7 of Chapter 6. This differs from project costs to improve the energy efficiency of an AIP eligible project discussed in Paragraph 3-70.	A fully functional project that increases the energy efficiency of airport power sources.	EN EQ MS

Table S-1 Environmental Planning/Mitigation Project Requirements

What Can Be Done If Justified	Factors to Consider For Justification and Eligibility	Required Usable Unit of Work and Required Outcome	Work Code*
g. Airport Sustainability Plan *(Note that the project name, Identify the Airports Environmental Footprint was only for the pilot program and is no longer in use)*	**(1)** The FAA has determined that this is airport planning under 49 USC § 47102(5) and is no longer a pilot program as of fiscal year 2012. **(2)** Until told otherwise by APP, the ADO must obtain approval of the scope from APP-400 prior to programming these types of projects. **(3)** The term *sustainability master plan* refers to a traditional master plan that incorporates sustainability, whereas an *airport sustainability plan* is a stand-alone document. The ADO must not fund a stand-alone airport sustainability plan if the sponsor is updating the master plan in the near future. **(4)** The project must follow all requirements provided by APP-400.	A completed study that the ADO has officially accepted.	EN PL ES
h. Construct Deicing Containment Facility	**(1)** 49 USC § 47102 makes construction, reconstruction, repair or purchasing capital equipment for meeting the requirements of 33 USC 1251, Federal Water Pollution Control Act eligible. **(2)** The facility must be for public-use, must be for aeronautical purposes, and must not serve revenue producing areas. **(3)** ACRP Report 14, Deicing Planning Guidelines and Practices for Stormwater Management Systems, is a useful reference.	A fully functional deicing containment facility that meets FAA standards.	EN OT DI

Table S-1 Environmental Planning/Mitigation Project Requirements

What Can Be Done If Justified	Factors to Consider For Justification and Eligibility	Required Usable Unit of Work and Required Outcome	Work Code*
i. Environmental Mitigation (Purchase Glycol Recovery Truck)	**(1)** This is also referred to as a glycol vacuum. **(2)** 49 USC § 47102(3)(F) and (G) makes construction, reconstruction, repair or purchasing capital equipment for meeting the requirements of 33 USC § 1251, Federal Water Pollution Control Act eligible. **(3)** The airport must own and operate the truck.	A fully functional glycol recovery truck that meets FAA standards.	EN OT MT
j. Environmental Mitigation *(Required by an Environmental Determination)*	**(1)** Environmental mitigation projects (such as wetland mitigation) approved in an environmental determination for an AIP eligible project is and allowable cost (or phase) of the AIP eligible project. **(2)** The costs of wetland monitoring for the required period of monitoring that is included in the record of decision, up to a maximum of five years is an allowable cost.	An environmental mitigation measure that meets the requirements of the environmental determination.	The work code of the associated AIP eligible project must be used

Table S-1 Environmental Planning/Mitigation Project Requirements

What Can Be Done If Justified	Factors to Consider For Justification and Eligibility	Required Usable Unit of Work and Required Outcome	Work Code*
k. Voluntary Airport Low Emissions (VALE) Infrastructure	**(1)** The ADO must coordinate all proposed projects with APP-400 and receive their approval for the project prior to programming the grant. **(2)** A large volume of guidance on this subject is available at the Airports Organization website. **(3)** Terminal gate air conditioning, heating and electric power is eligible as terminal development outside of the VALE program and does not require the airport to be in a nonattainment or maintenance area per 49 USC § 47102(3)(O). If the work is not approved under VALE, the ADO must code this work as terminal development and follow the terminal development requirements in Appendix N.	A fully functional VALE infrastructure.	EN EQ MS
l. VALE Vehicle	**(1)** The ADO must coordinate all proposed projects with APP-400 and receive their approval for the project prior to programming the grant. **(2)** A large volume of guidance on this subject is available at the Airports Organization website.	A fully functional VALE vehicle.	EN EQ MS
m. Zero Emissions Infrastructure	**(1)** The ADO must coordinate all proposed projects with APP-400 and receive their approval for the project prior to programming the grant. **(2)** The requirements, including that the Federal share is restricted to 50% per 49 USC § 47136a(d), are discussed in Section 6 of Chapter 6.	Fully functional zero emissions infrastructure.	EN EQ ZE

Table S-1 Environmental Planning/Mitigation Project Requirements

What Can Be Done If Justified	Factors to Consider For Justification and Eligibility	Required Usable Unit of Work and Required Outcome	Work Code*
n. Zero Emissions Vehicle	**(1)** The ADO must coordinate all proposed projects with APP-400 and receive their approval for the project prior to programming the grant. **(2)** The requirements, including that the Federal share is restricted to 50% per 49 USC § 47136a(d), are discussed in Section 6 of Chapter 6.	A fully functional zero emissions vehicle.	EN EQ ZE

*The official list of work codes can be obtained from the automated AIP system.

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Appendix T. Military Airport Program Projects

T-1. How to Use This Appendix.

This appendix is not a valid stand-alone document for making eligibility and justification determinations. The information in this appendix must be used in conjunction with the Handbook, especially the project cost requirements in Chapter 3.

T-2. Project Requirements Tables.

In addition to the information provided in the above paragraph and the following tables, Appendix C contains examples of prohibited projects and costs and is very useful to use alongside this appendix.

Table T-1 Distinctions between Construct, Expand, Modify, Improve, and Rehabilitate

Use the following description…	If the project will…
a. Construct	Build a brand new building.
b. Expand	Add on to an existing building.
c. Modify	Change a building.
d. Improve	Provide a distinct new feature to a building.
e. Rehabilitate	Extend the useful life of a building by completing major renovation or major replacement of parts of the building.

Table T-2 Military Airport Program Project Requirements (for typical projects)

What Can Be Done If Justified	Factors to Consider For Justification and Eligibility	Required Usable Unit of Work and Required Outcome	Work Code*
a. All regularly eligible AIP projects	**(1)** Unless otherwise specified in this table, all of the justification and eligibility factors that would normally be associated with the project, airport, and sponsor apply. **(2)** The FAA must have officially approved the airport and project for MAP funding before the grant is programmed. **(3)** The project must aid in the conversion of a military or former military facility to civilian use. **(4)** Per 49 USC § 47118(e), total MAP funding may not exceed $7 million per year per airport for terminal projects. Per 49 USC § 47118(f), total MAP funding may not exceed $7 million per year per airport for construction, improvement, or repair of airport surface parking lots, fuel farms, utilities, hangars and air cargo terminal building facilities that are 50,000 square feet or less. Hangars and air cargo terminal building facilities that are larger than 50,000 square feet are not eligible for funding. **(5)** Per 49 USC § 47118(e), terminal gate projects must not be leased for more than 10 years and must not be subject to a majority in interest clause. **(6)** Per APP-500 policy, the project justification must only be based on civilian operations. **(7)** The sponsor must have good title to the land on which the project sits as discussed in Table 6-14.	Same as for the regularly eligible AIP project.	Same as for the regularly eligible AIP project.

Table T-2 Military Airport Program Project Requirements (for typical projects)

What Can Be Done If Justified	Factors to Consider For Justification and Eligibility	Required Usable Unit of Work and Required Outcome	Work Code*
b. Miscellaneous Building (Construct, Expand, Modify, Improve, or Rehabilitate) *(Hangar)*	**(1)** The normal AIP restrictions for hangars do not apply (such as the requirement to meet airside needs, the restriction on discretionary, the restriction by funding type, and the restriction by airport type). **(2)** Except as noted above, all of the justification and eligibility factors that would normally be associated with the project, airport, and sponsor apply. **(3)** The FAA must have officially approved the airport and project for MAP funding before the grant is programmed. **(4)** The project must aid in the conversion of a military or former military facility to civilian use. **(5)** Per 49 USC § 47118(f), total MAP funding may not exceed $7 million per year per airport for construction, improvement, or repair of airport surface parking lots, fuel farms, utilities, hangars and air cargo terminal building facilities that are 50,000 square feet or less. **(6)** Per APP-500 policy, the project justification must only be based on civilian operations. **(7)** The sponsor must have good title to the land on which the project sits as discussed in Table 6-14.	A fully functional aircraft hangar.	ST BD MS

Table T-2 Military Airport Program Project Requirements (for typical projects)

What Can Be Done If Justified	Factors to Consider For Justification and Eligibility	Required Usable Unit of Work and Required Outcome	Work Code*
c. Miscellaneous Building (Construct, Expand, Modify, Improve, or Rehabilitate) *(Cargo Building)*	**(1)** The cargo building must not be exclusive use (see Appendix A for a definition and references on exclusive use). **(2)** The facility must be 50,000 square feet or less. **(3)** Except as noted above, all of the justification and eligibility factors that would normally be associated with the project, airport, and sponsor apply. **(4)** The FAA must have officially approved the airport and project for MAP funding before the grant is programmed. **(5)** The project must aid in the conversion of a military or former military facility to civilian use. **(7)** Per 49 USC § 47118(f), total MAP funding may not exceed $7 million per year per airport for construction, improvement, or repair of airport surface parking lots, fuel farms, utilities, hangars and air cargo terminal building facilities that are 50,000 square feet or less. **(8)** Per APP-500 policy, the project justification must only be based on civilian operations. **(9)** The sponsor must have good title to the land on which the project sits as discussed in Table 6-14.	A fully functional cargo building.	ST BD MS

Table T-2 Military Airport Program Project Requirements (for typical projects)

What Can Be Done If Justified	Factors to Consider For Justification and Eligibility	Required Usable Unit of Work and Required Outcome	Work Code*
d. Construct Utilities	**(1)** Eligible costs include utility upgrades necessary to meet code requirements, to support the civilian function of a MAP airport, or to allow utilities serving the civilian portion of the base to be separated from the military portion. **(2)** Except as noted above, all of the justification and eligibility factors that would normally be associated with the project, airport, and sponsor apply. **(3)** The FAA must have officially approved the airport and project for MAP funding before the grant is programmed. **(4)** The project must aid in the conversion of a military or former military facility to civilian use. **(5)** Per 49 USC § 47118(e), total MAP funding may not exceed $7 million per year per airport for terminal projects. Per 49 USC § 47118(f), total MAP funding may not exceed $7 million per year per airport for construction, improvement, or repair of airport surface parking lots, fuel farms, utilities, hangars and air cargo terminal building facilities that are 50,000 square feet or less. These limits include the costs of utility projects. **(6)** Per APP-500 policy, the project justification must only be based on civilian operations. **(7)** The sponsor must have good title to the land on which the project sits as discussed in Table 6-14.	A fully functional utility system.	OT OT FF

Table T-2 Military Airport Program Project Requirements (for typical projects)

What Can Be Done If Justified	Factors to Consider For Justification and Eligibility	Required Usable Unit of Work and Required Outcome	Work Code*
e. Parking Lot (Construct or Rehabilitate)	**(1)** The parking lot must be a surface parking lot. **(2)** The other normal AIP restrictions for parking lots do not apply (such as the restriction by airport type and the restriction against revenue production). **(3)** Except as noted above, all of the justification and eligibility factors that would normally be associated with the project, airport, and sponsor apply. **(4)** The FAA must have officially approved the airport and project for MAP funding before the grant is programmed. **(5)** The project must aid in the conversion of a military or former military facility to civilian use. **(6)** Per 49 USC § 47118(f), total MAP funding may not exceed $7 million per year per airport for construction, improvement, or repair of airport surface parking lots, fuel farms, utilities, hangars and air cargo terminal building facilities that are 50,000 square feet or less. **(7)** Per APP-500 policy, the project justification must only be based on civilian operations. **(8)** The sponsor must have good title to the land on which the project sits as discussed in Table 6-14.	A fully functional parking lot.	OT OT PA

Table T-2 Military Airport Program Project Requirements (for typical projects)

What Can Be Done If Justified	Factors to Consider For Justification and Eligibility	Required Usable Unit of Work and Required Outcome	Work Code*
f. Fuel Farms (Construct, Repair, or Improve)	**(1)** The normal AIP restrictions for fuel farms do not apply (such as the restriction by airport type and the restriction against revenue production). **(2)** Except as noted above, all of the justification and eligibility factors that would normally be associated with the project, airport, and sponsor apply. **(3)** The FAA must have officially approved the airport and project for MAP funding before the grant is programmed. **(4)** The project must aid in the conversion of a military or former military facility to civilian use. **(5)** Per 49 USC § 47118(f), total MAP funding may not exceed $7 million per year per airport for construction, improvement, or repair of airport surface parking lots, fuel farms, utilities, hangars and air cargo terminal building facilities that are 50,000 square feet or less. **(6)** Per APP-500 policy, the project justification must only be based on civilian operations. **(7)** The sponsor must have good title to the land on which the project sits as discussed in Table 6-14. **(8)** The facility must meet the requirements of 40 CFR § 112.8, Spill Prevention, Control, and Countermeasure Plan Requirements for On-Shore Facilities (excluding production facilities).	A fully functional fuel farm.	OT OT FF

Table T-2 Military Airport Program Project Requirements (for typical projects)

What Can Be Done If Justified	Factors to Consider For Justification and Eligibility	Required Usable Unit of Work and Required Outcome	Work Code*
g. Operational and Maintenance Expenses (per 49 USC § 47117(e)(1)(B))	**(1)** The airport cannot be a commercial service airport. **(2)** The ADO must restrict the grant amount for this type of work to $30,000 in any fiscal year. **(3)** The FAA must have determined that the airport is adversely affected by the base closure or realignment. **(4)** The sponsor of the airport must certify to the ADO that the airport would otherwise close if the airport does not receive the grant. **(5)** The FAA must have officially approved the airport and project for MAP funding before the grant is programmed.	An airport that remains open.	The ADO must contact APP-520 for the correct work code.

Table T-2 Military Airport Program Project Requirements (for typical projects)

What Can Be Done If Justified	Factors to Consider For Justification and Eligibility	Required Usable Unit of Work and Required Outcome	Work Code*
h. A project to preserve or enhance minimum airfield infrastructure under 49 USC § 47118(h) *(Safety Critical Airports)*	**(1)** APP-1 must have designated the airport as a safety critical airport. **(2)** The APP-500 must have officially approved the project for MAP funding before the grant is programmed. **(3)** The normal AIP restrictions for these projects do not apply. **(4)** The airport is federally owned. **(5)** The project is necessary to meet the minimum safety and emergency operational requirements established under 14 CFR part 139. **(6)** The project is necessary to support emergency diversionary operations for transoceanic flights in locations that meet the following criteria: **(a)** Locations within United States jurisdiction or control. **(b)** Locations where there is a demonstrable lack of diversionary airports within the distance or flight-time required by regulations governing transoceanic flights.	A completed project that meets 49 USC § 47118(h).	Same as for the regularly eligible AIP project.

*The official list of work codes can be obtained from the automated AIP system.

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Appendix U. Sponsor Procurement Requirements (Including 2 CFR §§ 200.317-200.326 (formerly 49 CFR § 18.36))

U-1. Appendix Layout.

This appendix contains 2 CFR §§ 200.317-200.326 in its entirety, with clarifications. As discussed in detail in Paragraph 1-7, this regulation replaced 49 CFR § 18.36 on December 19, 2014.

The remaining paragraphs in this Appendix contain additional sponsor contracting and miscellaneous procurement issues not directly addressed in CFR §§ 200.317-200.326.

Section 10 of Chapter 3 contains ADO procurement responsibilities.

U-2. Sponsor Force Account Costs.

Procurement is obtaining services from commercial sources, therefore, sponsor force account work does not fall under the procurement rules of 2 CFR §§ 200.317-200.326. The rules for sponsor force account work are contained in Paragraph 3-53.

U-3. Sponsor Furnished Material or Supplies.

If a sponsor wishes to provide materials or supplies within an AIP funded project, the sponsor must obtain prior written approval from the ADO. The sponsor must provide a written statement to the ADO indicating whether the material or supplies have been procured per 2 CFR §§ 200.317-200.326 and meet all applicable Federal contract provisions, which can be found on the FAA Office of Airports website (see Appendix B for link). The ADO also has the option to request that the sponsor submit additional documentation to support this statement.

The requirements for the ADO to concur with the use of sponsor furnished materials or supplies are contained in Paragraph 3-36.

U-4. Buy American Requirements.

The Buy American Preferences under 49 USC § 50101 require that all steel and manufactured goods used in AIP funded projects are produced in the United States. Detailed sponsor and ADO requirements are included in Appendix X.

U-5. Suspension or Debarment of Persons or Companies.

Table U-1 contains the requirements sponsors must follow regarding persons or companies that have been excluded from working on AIP funded projects.

Additional information on suspension and debarment is available on the FHWA Construction Program Guide/Suspension and Debarment and the current version of DOT Order 4200.5, Suspension and Debarment, and Ineligibility Procedures.

Table U-1 Sponsor Requirements Regarding Suspension or Debarment

For the following…	The sponsor requirements include…
a. The sponsor is awarding a contract.	2 CFR part 180, OMB Guidelines to Agencies on Governmentwide Debarment and Suspension (Nonprocurement) prohibits a sponsor from entering into a new contract with a person or company that is suspended or debarred. A sponsor must check the System for Award Management (SAM) website (see Appendix B for link) for every procurement to ensure that no suspended or debarred firms or individuals bid on, or are part of an AIP contract.
b. A person or company currently working on an AIP project is suspended or debarred.	If the Federal government suspends or debars a person or company while the person or company is working on an AIP funded project, the sponsor must follow the procedures in 2 CFR part 180 (Subpart C) OMB Guidelines to Agencies on Governmentwide Debarment and Suspension (Nonprocurement), and 2 CFR part 1200, Nonprocurement Suspension and Debarment.
c. It appears that a person or company might need to be suspended or debarred.	If the sponsor becomes aware of this situation, the sponsor must pursue their own contractual remedies and has the option to contact the ADO with this information.
d. The sponsor has suspended or debarred a person or company.	Per the current version of DOT Order 4200.5, Suspension and Debarment Procedures and Ineligibility, the sponsor must notify the ADO.

U-6. Terminology Used in Industry

Industry terminology is evolving and may differ from the terminology contained in 2 CFR §§ 200.317-200.326. This is especially true in 2 CFR § 200.320(d) for competitive proposals. Sponsors are cautioned that the many project delivery methods, regardless of the terminology, must still conform to the basic requirements within this regulation.

U-7. Prohibited Light Emitting Diode (LED) Lighting.

The list of LED lighting that is prohibited from AIP funding is included in Paragraph C-2.

The sponsor must separately procure the prohibited LED lighting equipment from any associated AIP funded project. However, the sponsor may include the installation in the contract of the associated AIP funded project. The eligibility for the purchase and installation of this equipment is contained in Paragraph 3-93.

Sponsors must notify the ADO when the sponsor is proposing to procure prohibited LED lighting concurrently with an associated AIP funded project and confirm that the procurement of the lighting equipment will be separate from the associated AIP funded project. The ADO has the option to review the sponsor's procurement documents to ensure that the sponsor has separated AIP funded procurement and prohibited LED lighting equipment procurement.

U-8. Why 2 CFR §§ 200.317-200.326 is Reproduced in This Appendix.

2 CFR §§ 200.317-200.326 is a critical companion document to the Handbook, and sponsors and ADOs should refer to its contents frequently. Therefore, this regulation has been included below in its entirety. In addition, clarifications have been added under the sections as appropriate.

U-9. 2 CFR § 200.317 - Procurements by States.

The following italicized text is directly quoted from 2 CFR part 200.

§ 200.317 Procurements by states.

When procuring property and services under a Federal award, a state must follow the same policies and procedures it uses for procurements from its non-Federal funds. The state will comply with § 200.322 Procurement of recovered materials and ensure that every purchase order or other contract includes any clauses required by section § 200.326 Contract provisions. All other non-Federal entities, including subrecipients of a state, will follow §§ 200.318 General procurement standards through 200.326 Contract provisions.

Table U-2 AIP Handbook Clarification of 2 CFR § 200.317 - Procurements by States

Clarifications include…
(1) **Difference Between State Procurement Standards and State Design, Planning, or Construction Standards.** State procurement standards are not the same thing as the state planning, design, or construction standards discussed in Paragraph 3-26.
(2) **Buying off a State Schedule.** A sponsor is *not* allowed to purchase off a state schedule unless the state procurement includes *all* of the required causes in 2 CFR § 200.317.
(3) **Subrecipient of States.** Per 2 CFR § 1201.317, the DOT has provided the following exception: **(a)** Notwithstanding 2 CFR § 200.317, subrecipient of states must follow such policies and procedures allowed by the State when procuring property and services under a Federal award.

U-10. 2 CFR § 200.318 - General Procurement Standards.

The following italicized text is directly quoted from 2 CFR part 200.

§ 200.318 General procurement standards.

(a) The non-Federal entity must use its own documented procurement procedures which reflect applicable State and local laws and regulations, provided that the procurements conform to applicable Federal law and the standards identified in this section.

(b) Non-Federal entities must maintain oversight to ensure that contractors perform in accordance with the terms, conditions, and specifications of their contracts or purchase orders.

(c)

(1) The non-Federal entity must maintain written standards of conduct covering conflicts of interest and governing the performance of its employees engaged in the selection, award and administration of contracts. No employee, officer, or agent must participate in the selection, award, or administration of a contract supported by a Federal award if he or she has a real or apparent conflict of interest. Such a conflict of interest would arise when the employee, officer, or agent, any member of his or her immediate family, his or her partner, or an organization which employs or is about to employ any of the parties indicated herein, has a financial or other interest in or a tangible personal benefit from a firm considered for a contract. The officers, employees, and agents of the non-Federal entity must neither solicit nor accept gratuities, favors, or anything of monetary value from contractors or parties to subcontracts. However, non-Federal entities may set standards for situations in which the financial interest is not substantial or the gift is an unsolicited item of nominal value. The standards of conduct must provide for disciplinary actions to be applied for violations of such standards by officers, employees, or agents of the non-Federal entity.

(2) If the non-Federal entity has a parent, affiliate, or subsidiary organization that is not a state, local government, or Indian tribe, the non-Federal entity must also maintain written standards of conduct covering organizational conflicts of interest. Organizational conflicts of interest means that because of relationships with a parent company, affiliate, or subsidiary organization, the non-Federal entity is unable or appears to be unable to be impartial in conducting a procurement action involving a related organization.

(d) The non-Federal entity's procedures must avoid acquisition of unnecessary or duplicative items. Consideration should be given to consolidating or breaking out procurements to obtain a more economical purchase. Where appropriate, an analysis will be made of lease versus purchase alternatives, and any other appropriate analysis to determine the most economical approach.

(e) To foster greater economy and efficiency, and in accordance with efforts to promote cost-effective use of shared services across the Federal government, the non-Federal entity is encouraged to enter into state and local intergovernmental agreements or inter-entity agreements where appropriate for procurement or use of common or shared goods and services.

(f) The non-Federal entity is encouraged to use Federal excess and surplus property in lieu of purchasing new equipment and property whenever such use is feasible and reduces project costs.

(g) The non-Federal entity is encouraged to use value engineering clauses in contracts for construction projects of sufficient size to offer reasonable opportunities for cost reductions.

Value engineering is a systematic and creative analysis of each contract item or task to ensure that its essential function is provided at the overall lower cost.

(h) The non-Federal entity must award contracts only to responsible contractors possessing the ability to perform successfully under the terms and conditions of a proposed procurement. Consideration will be given to such matters as contractor integrity, compliance with public policy, record of past performance, and financial and technical resources.

(i) The non-Federal entity must maintain records sufficient to detail the history of procurement. These records will include, but are not necessarily limited to the following: rationale for the method of procurement, selection of contract type, contractor selection or rejection, and the basis for the contract price.

(j)

(1) The non-Federal entity may use time and material type contracts only after a determination that no other contract is suitable and if the contract includes a ceiling price that the contractor exceeds at its own risk. Time and material type contract means a contract whose cost to a non-Federal entity is the sum of:

(i) The actual cost of materials; and

(ii) Direct labor hours charged at fixed hourly rates that reflect wages, general and administrative expenses, and profit.

(2) Since this formula generates an open-ended contract price, a time-and-materials contract provides no positive profit incentive to the contractor for cost control or labor efficiency. Therefore, each contract must set a ceiling price that the contractor exceeds at its own risk. Further, the non-Federal entity awarding such a contract must assert a high degree of oversight in order to obtain reasonable assurance that the contractor is using efficient methods and effective cost controls.

(k) The non-Federal entity alone must be responsible, in accordance with good administrative practice and sound business judgment, for the settlement of all contractual and administrative issues arising out of procurements. These issues include, but are not limited to, source evaluation, protests, disputes, and claims. These standards do not relieve the non-Federal entity of any contractual responsibilities under its contracts. The Federal awarding agency will not substitute its judgment for that of the non-Federal entity unless the matter is primarily a Federal concern. Violations of law will be referred to the local, state, or Federal authority having proper jurisdiction.

Table U-3 AIP Handbook Clarification of 2 CFR § 200.318 - General Procurement Standards

Clarifications include…	
(1)	**Required Notification to ADO.** Sponsors are responsible for complying with 2 CFR §§ 200.317-200.326. If the sponsor's procurement procedures or operations fail to comply with 2 CFR §§ 200.317-200.326, the sponsor must notify the ADO in writing.
(2)	**Intergovernmental Agreement.** An example where an intergovernmental agreement may be appropriate is where several small airports would like to purchase an AWOS-A for each of the airports. Another example is where a state aviation department enters into a task order contract for eligible pavement maintenance at multiple airports within the state.
(3)	**Time and Materials Contract.** The time and materials contract discussed under 2 CFR § 200.318(j) is only used in the rare instance that no other contract method is suitable.
(4)	**Suitable Contract.** The sponsor is the entity that determines contract suitability under 2 CFR § 200.318(j)(1).
(5)	**Fixed Hourly Rate.** Under 2 CFR § 200.318(j), the hourly rate is fixed for the duration of the contract and cannot be changed when salaries increase.
(6)	**Value Engineering.** Per FAA policy, sponsors are required to use value engineering for new primary airports. In addition, ADOs have the option to require sponsors to use value engineering for unusually complex projects of greater than average costs (or require cost-benefit studies, present worth analysis, the study of alternatives, tactical planning, or other forms of technical evaluation). Value engineering must follow the requirements of the current version of Advisory Circular 150/5300-15, Use of Value Engineering for Engineering and Design of Airport Grant Projects. In addition, the ADO must have concurred in writing on the scope of the value engineering contract prior to the work commencing. Sponsors are cautioned that significant advance preparation may be needed for value engineering.
(7)	**Sponsor Written Protest Procedures.** Per FAA policy (formerly captured in 49 CFR § 18.36(b)(12)), the sponsor must have *written* protest procedures in place before initiating any procurement actions that will be funded with AIP. The protest procedures must define how the sponsor will handle and resolve disputes relating to their procurements and must disclose information regarding the protest to the ADO. A protestor must exhaust all administrative remedies with the sponsor before pursuing a protest with the ADO.
(8)	**Submittal of All Protests and Appeals to ADO.** Per FAA policy, the sponsor must send a copy of the protest and the sponsor's written protest procedures to the ADO without delay. The sponsor must also send a copy of the resolution to the ADO. The ADO will not formally act on bid protests until the protester has exhausted all administrative remedies with the sponsor and the protester submits a formal appeal to the ADO. The ADO's role is limited to a review of 1) violations of Federal law and rules, and 2) violations of the sponsor's protest procedures.

Table U-3 AIP Handbook Clarification of 2 CFR § 200.318 - General Procurement Standards

Clarifications include…
(9) Defects in Bid Solicitation. Per FAA policy, if a protester formally disputes the procurement because the bid solicitation is allegedly defective, it is the responsibility of the protester to notify the sponsor in writing before the bid opening (or before a reasonable deadline set by the sponsor). This will allow the sponsor to correct the deficiency by amending the solicitation. Per FAA policy, if a protester disputes a defective solicitation after bid opening, the sponsor has the choice of rejecting the protest without action if state and/or local procurement rules allow. This is because a protester normally has enough time to protest before bid opening. If the sponsor uses a shortened bidding time (such as 10 days), the FAA recommends that the sponsor accept protests up to contract award. If the protester is not satisfied with the way that the sponsor has resolved the protest, the protester has the option to appeal to the ADO. The ADO acceptance of a Sponsor Certification or the ADO approval of the plans and specifications does not relieve the sponsor of their responsibility for the accuracy, completeness, or technical content of the plans and specifications.
(10) Improper Evaluation of Bids. While protests pertaining to defective solicitations are made prior to bid opening, protests regarding improper bid evaluations occur after bid opening. If the protester believes the sponsor has improperly awarded the project, it is the responsibility of the protester to notify the sponsor in writing of their protest. If the protester is not satisfied with the way that the sponsor has resolved the dispute, the protester has the option to appeal to the ADO.
(11) Switching Suppliers or Subcontractors. A *contractor* may switch suppliers or subcontractors as long as there is no change in the bid and the requirements of 49 CFR part 26 are met. There is no Federal requirement preventing a *contractor* from switching suppliers or subcontractors as long as there is no change in the bid. However, the *sponsor* must not influence the contractor's selection of subcontractors or suppliers. If the sponsor directs or influences a change in supplier or subcontractor, this would be a 2 CFR §§ 200.317-200.326 violation since the sponsor is interfering with the open and competitive market.
(12) Potential Funding Impacts. Failure of the sponsor to properly resolve a bid protest or an ADO identified violation may result in a loss of AIP funding.
(13) Submittal of Resolutions to the ADO. The sponsor must notify the ADO in writing how all bid protest and appeals were resolved.
(14) Restrictions on Payment Requests for Disputed Costs. If the project is already under grant, the sponsor must not request payments for the disputed costs.

U-11. 2 CFR § 200.319 - Competition.

The following italicized text is directly quoted from 2 CFR part 200.

§ 200.319 Competition.

(a) All procurement transactions must be conducted in a manner providing full and open competition consistent with the standards of this section. In order to ensure objective contractor

performance and eliminate unfair competitive advantage, contractors that develop or draft specifications, requirements, statements of work, and invitations for bids or requests for proposals must be excluded from competing for such procurements. Some of the situations considered to be restrictive of competition include but are not limited to:

(1) Placing unreasonable requirements on firms in order for them to qualify to do business;

(2) Requiring unnecessary experience and excessive bonding;

(3) Noncompetitive pricing practices between firms or between affiliated companies;

(4) Noncompetitive contracts to consultants that are on retainer contracts;

(5) Organizational conflicts of interest;

(6) Specifying only a "brand name" product instead of allowing "an equal" product to be offered and describing the performance or other relevant requirements of the procurement; and

(7) Any arbitrary action in the procurement process.

(b) The non-Federal entity must conduct procurements in a manner that prohibits the use of statutorily or administratively imposed state or local geographical preferences in the evaluation of bids or proposals, except in those cases where applicable Federal statutes expressly mandate or encourage geographic preference. Nothing in this section preempts state licensing laws. When contracting for architectural and engineering (A/E) services, geographic location may be a selection criterion provided its application leaves an appropriate number of qualified firms, given the nature and size of the project, to compete for the contract.

(c) The non-Federal entity must have written procedures for procurement transactions. These procedures must ensure that all solicitations:

(1) Incorporate a clear and accurate description of the technical requirements for the material, product, or service to be procured. Such description must not, in competitive procurements, contain features which unduly restrict competition. The description may include a statement of the qualitative nature of the material, product or service to be procured and, when necessary, must set forth those minimum essential characteristics and standards to which it must conform if it is to satisfy its intended use. Detailed product specifications should be avoided if at all possible. When it is impractical or uneconomical to make a clear and accurate description of the technical requirements, a "brand name or equivalent" description may be used as a means to define the performance or other salient requirements of procurement. The specific features of the named brand which must be met by offers must be clearly stated; and

(2) Identify all requirements which the offerors must fulfill and all other factors to be used in evaluating bids or proposals.

(d) The non-Federal entity must ensure that all prequalified lists of persons, firms, or products which are used in acquiring goods and services are current and include enough qualified sources to ensure maximum open and free competition. Also, the non-Federal entity must not preclude potential bidders from qualifying during the solicitation period.

Table U-4 AIP Handbook Clarification of 2 CFR § 200.319 - Competition

Clarifications include…
(1) Unfair Competitive Advantage. Per 2 CFR § 200.319, contractors and consultants who develop or draft specifications, requirements, statements of work, invitations for bids, or requests for proposals on a project are not allowed to bid or submit a proposal on that project.
(2) Brand Name or Equal. If an existing FAA technical specification establishes all necessary performance requirements, the FAA considers the use of a brand name or equal to be a restriction on competition. A sponsor must not disqualify a material, product, or service for not having a characteristic that the brand name material, product, or service possesses if the characteristic was not explicitly identified in the technical requirements.
(3) Matching Existing Equipment. Sponsors often want to specify a particular company or brand of equipment so that the acquired equipment matches what is currently at the airport. The requirements for these situations are contained in Paragraph 3-36.
(4) Required Notification to ADO. If the specification requires a *brand name or equal* product, the sponsor must notify the ADO in writing prior to the award. A sponsor requiring that contractors obtain sponsor approval for a product *prior* to the award if the product is not a specified brand name or equal. This could unduly limit competition by placing additional burdens on the non-brand name product.
(5) Examples of situations that do *not* unduly limit competition. Some examples include: **(a)** A sponsor limiting the height of an ARFF vehicle based on the existing height of the ARFF building door. **(b)** A sponsor specifying sign face dimensions to fit in the existing sign units because the taxiways have been renamed as a result of an AIP funded project.
(6) Examples of situations that could unduly limit competition. Some examples include: **(a)** A sponsor specifying Company X or equal for an L-858R, Mandatory Instruction Sign. Since an existing FAA technical specification establishes all necessary performance requirements, it is unnecessary for the sponsor to specify an actual company and implies a sponsor preference. **(b)** A sponsor specifying that an ARFF truck windshield wiper must be mounted on the top center of the windshield. However, this is not a required feature for performance of the ARFF vehicle and is not a standard feature for ARFF trucks for all manufacturers. This places an unreasonable requirement that could unduly limit competition. **(c)** A sponsor including a requirement for personal attendance at a pre-bid meeting for a project. Contractors and suppliers may not need to attend a pre-bid meeting if they are already very familiar with the project site, or have another member of the bidding team attending the meeting. This places an unreasonable requirement that could unduly limit competition.

Table U-4 AIP Handbook Clarification of 2 CFR § 200.319 - Competition

Clarifications include…
(7) Geographical Preference. Some examples of geographical preference that unduly limit competition are: **(a)** A sponsor requiring a vendor to have local maintenance support within 50 miles or 40 minutes away from the airport. **(b)** A sponsor requiring that a percentage of employees reside in the city, county, or state boundaries. **(c)** A sponsor requiring that a percentage of the required materials be purchased from companies located in the city, county, or state boundaries.

U-12. 2 CFR § 200.320 - Methods of Procurement to be Followed.

The following italicized text is directly quoted from 2 CFR part 200.

§ 200.320 Methods of procurement to be followed.

The non-Federal entity must use one of the following methods of procurement.

Table U-5 AIP Handbook Clarification of 2 CFR § 200.320 - Methods of Procurement to be Followed

Clarifications include...
(1) Difference from Procurement of Professional Services. Sponsors must not confuse the small purchase procurement procedures with the requirements for procurement of professional services discussed in the current version of Advisory Circular 150/5100-14, Architectural, Engineering, and Planning Consultant Services for Airport Grant Projects. The procurement of professional services is not tied to the small purchase procedure threshold ($150,000) noted above.
(2) Sponsor Documentation. Sponsors must adequately document all quotations in writing and make this available to the ADO upon request. It is FAA policy that adequate documentation for projects over $10,000 includes a letter request from the sponsor and a written estimate from each qualified source. For projects $10,000 or below, it is FAA policy that the sponsor has the option of obtaining the quotes verbally as long as the sponsor documents the results in writing.
(3) Submittal of Technical Specifications to ADO. Per 2 CFR § 200.324(a), sponsors must submit all technical specifications to the ADO upon the ADO's request. This may include the plans, the specifications, the engineer's report, and any other items that make up the procurement package.
(4) Calculation of $150,000 and $10,000. It is FAA policy that the *accepted* quote must come below $150,000 for the sponsor to use the small procurement process. It is FAA policy that the *accepted* quote must come below $10,000 for the sponsor to obtain quotes verbally.

Table U-5 AIP Handbook Clarification of 2 CFR § 200.320 - Methods of Procurement to be Followed

Clarifications include...
(5) Indefinite Quantity/Delivery (Task Orders for Construction and Equipment). This contracting method defines a minimum and maximum quantity that may be obtained at any time during the contract period through individual task orders. This contracting method is rarely used for AIP projects. In order to be used for an AIP project, the contract must include any clauses required by Federal statutes and Executive orders and their implementing regulations and must not exceed 12 months unless the contract contains provisions for updating Davis-Bacon requirements. In addition, it is FAA policy that the contract must not exceed five years.
(6) Proposals Containing Ineligible and/or non-AIP Funded Work. Per FAA policy, sponsors must obtain written ADO concurrence before including ineligible and/or non-AIP funded work within the same contract (see Paragraph 3-39). Per FAA policy, the sponsor must award to the lowest responsive and responsible bidder *on the AIP-funded portion of the contract* when the bid is separated by line items or bid schedules. The sponsor must award to the lowest responsive and responsible bidder *on the entire contract* when the bid will be prorated for Federal participation.
(7) Projects Exceeding Design Standards. Per FAA policy, sponsors must obtain written ADO concurrence before designing or bidding a project that will exceed FAA design standards (see Paragraph 3-24).
(8) Proposals Containing Improper Bid Alternates. Sponsors must not use the procurement process, such as including bid alternates, as a means of determining project costs. For example, a sponsor has justified the acquisition of a 1,500 gallon ARFF vehicle but plans to acquire a 3,000 gallon ARFF vehicle, paying the additional costs with local sources of funding. The sponsor is not allowed to bid both vehicles because the procurement process is based on an expectation that the sponsor intends to complete the procurement. In this case, the sponsor has no plan to acquire a 1,500 gallon ARFF vehicle and is simply using the procurement process as a cost estimating tool, which is not allowed.

U-13. 2 CFR § 200.320(a) - Procurement by Micro-Purchases.

The following italicized text is directly quoted from 2 CFR part 200.

(a) Procurement by micro-purchase is the acquisition of supplies or services, the aggregate dollar amount of which does not exceed $3,000 (or $2,000 in the case of acquisitions for construction subject to the Davis-Bacon Act). To the extent practicable, the non-Federal entity must distribute micro-purchases equitably among qualified suppliers. Micro-purchases may be awarded without soliciting competitive quotations if the non-Federal entity considers the price to be reasonable.

Table U-6 AIP Handbook Clarification of 2 CFR § 200.320(a) - Procurement by Micro-Purchases

Clarifications include...
(1) New Requirement. This requirement was not found in 49 CFR 18.36.
(2) Construction Supplies and Services. This is limited to $2,000 under the micro-purchase procurement method.
(3) Non- Construction Supplies and Services. This is limited to $3,000 under the micro-purchase procurement method.
(4) Abuse of Micro-Purchase Procurement Method. Sponsors must not split a single procurement action into multiple procurement actions in order to apply the micro –purchase procurement method..

U-14. 2 CFR § 200.320(b) - Procurement by Small Purchase Procedures.

The following italicized text is directly quoted from 2 CFR part 200.

(b) Procurement by small purchase procedures. Small purchase procedures are those relatively simple and informal procurement methods for securing services, supplies, or other property that do not cost more than the Simplified Acquisition Threshold. If small purchase procedures are used, price or rate quotations must be obtained from an adequate number of qualified sources.

Table U-7 AIP Handbook Clarification of 2 CFR § 200.320(b) - Procurement by Small Purchase Procedures

Clarifications include…
(1) Clarifications for all Procurement Methods. Additional clarifications that apply to all procurement methods, including small purchase procurement, are contained in Paragraph U-12.
(2) Adequate Number of Qualified Sources. The FAA considers an adequate number of qualified sources to be two or more for small purchase procedures (the same as for competitive bids under 2 CFR § 200.320(c)(1)(ii)). If the sponsor is only able to obtain a quotation from one qualified source, then the sponsor must then follow sole source requirements.
(3) Simplified Acquisition Threshold. The simplified acquisition threshold is set in 2 CFR § 200.88 at $150,000. This was previously directly referenced in 49 CFR § 18.36(d)(1) as $100,000.

U-15. 2 CFR § 200.320(c) - Procurement by Sealed Bids (Formal Advertising).

The following italicized text is directly quoted from 2 CFR part 200.

(c) Procurement by sealed bids (formal advertising). Bids are publicly solicited and a firm fixed price contract (lump sum or unit price) is awarded to the responsible bidder whose bid, conforming with all the material terms and conditions of the invitation for bids, is the lowest in price. The sealed bid method is the preferred method for procuring construction, if the conditions in paragraph (c)(1) of this section apply.

(1) In order for sealed bidding to be feasible, the following conditions should be present:

(i) A complete, adequate, and realistic specification or purchase description is available;

(ii) Two or more responsible bidders are willing and able to compete effectively for the business; and

(iii) The procurement lends itself to a firm fixed price contract and the selection of the successful bidder can be made principally on the basis of price.

(2) If sealed bids are used, the following requirements apply:

(i) The invitation for bids will be publicly advertised and bids must be solicited from an adequate number of known suppliers, providing them sufficient response time prior to the date set for opening the bids;

(ii) The invitation for bids, which will include any specifications and pertinent attachments, must define the items or services in order for the bidder to properly respond;

(iii) All bids will be publicly opened at the time and place prescribed in the invitation for bids;

(iv) A firm fixed price contract award will be made in writing to the lowest responsive and responsible bidder. Where specified in bidding documents, factors such as discounts, transportation cost, and life cycle costs must be considered in determining which bid is lowest. Payment discounts will only be used to determine the low bid when prior experience indicates that such discounts are usually taken advantage of; and

(v) Any or all bids may be rejected if there is a sound documented reason.

Table U-8 AIP Handbook Clarification of 2 CFR § 200.320(c) - Procurement by Sealed Bids (Formal Advertising)

Clarifications include…
(1) Clarifications for all Procurement Methods. Additional clarifications that apply to all procurement methods are contained in Paragraph U-12. These clarifications must be used in addition to the ones listed below.
(2) Required Notification to ADO. The sponsor must notify the ADO in writing prior to the award if the procurement is expected to exceed the simplified acquisition threshold (provided in Table U-7) and any of the following situations apply: **(a)** The award will be made without competition. **(b)** Only one bid is received. **(c)** The award will be made to other than the apparent low bidder.
(3) Submittal of Technical Specifications to ADO. Per 2 CFR § 200.324(a), sponsors must submit all technical specifications to the ADO upon the ADO's request. This may include the plans, the specifications, the engineer's report, and any other items that make up the procurement package.
(4) Items Needed for Bidder to Properly Respond. Bid documents must specify the method by which the successful bid will be determined, which may include factors such as life cycle costs, bid alternates, and availability of Federal funding.
(5) Responsive vs. Responsible. The terms responsive and responsible are often misunderstood. *Responsive* applies to the bid documents filed by a bidder and *responsible* applies to qualifications of the bidder. **(a)** *Responsive*. A responsive bid conforms to all significant terms and conditions contained in the sponsor's invitation for bid. It is the sponsor's responsibility to decide if the exceptions taken by a bidder to the solicitation are material or not and the extent of deviation it is willing to accept. **(i)** Material Deviations. It is FAA policy that sponsors may not waive material deviations. Material deviations include those that affect significant terms and conditions of the invitation for bids such as delivery time, quantity, technical specifications, price, or failure to send required bond and insurance information. **(ii)** Minor Deviations. It is FAA policy that sponsors may waive minor deviations. These might include a simple failure to enter an extended price on an item, when such extended price can be ascertained simply by multiplying the unit price by the number of units. **(b)** *Responsible.* A responsible bidder has the ability to perform successfully under the terms and conditions of a proposed procurement, as defined in 2 CFR § 200.318(h). This includes such matters as contractor integrity, compliance with public policy, record of past performance, and financial and technical resources.
(6) Apparent Low Bidder. The apparent low bidder is the bidder with the lowest dollar proposal, and does not reflect whether the sponsor has determined the bidder to be responsive or responsible.

Table U-8 AIP Handbook Clarification of 2 CFR § 200.320(c) - Procurement by Sealed Bids (Formal Advertising)

Clarifications include…
(7) Bid Alternates. A sponsor must not bid a project with alternates (additive or deductive) without establishing how an award will be made within the bid package (commonly referred to as the basis for award). Otherwise, Federal participation may be adversely affected because the bid documents could be considered unclear and the award arbitrary. **(a)** The solicitation must clearly establish the base bid and must define the order of bid alternate combinations based on the availability of funding. **(b)** Sponsors must not arbitrarily choose a bid alternate combination for an unallowable purpose such as choosing or eliminating a specific bidder. **(c)** Sponsors have the option of consulting with the ADO to validate that their use of bid alternates will meet grant requirements. **(d)** The FAA cautions sponsors against using an excessive amount of bid alternates because it may create ambiguities in the bid award. **(e)** Life cycle cost analyses is often used for as part of establishing the basis for award for bid alternatives. **(f)** If a sponsor is bidding both asphalt and concrete alternatives in a project, there are funding implications as discussed in Paragraph 3-46
(8) Life Cycle Cost Analysis (LCCA). The life cycle cost concept recognizes that although an item may have the lowest initial cost, it may be more expensive than another item when costs such as operation and maintenance are considered. Under the life cycle cost concept, any costs expected to be incurred for the item over its useful life (including acquisition, installation, operation, and maintenance) are considered. Cost data must be verifiable independently of a claim by the manufacturer or contractor. OMB Circular A-94, Guidelines and Discount Rates for Benefit-Cost Analysis of Federal Programs, requires elements of a life cycle cost analysis include the following: **(a)** The LCCA must explicitly state assumptions, benefit factors, and costs. **(b)** Sponsors must identify key data for independent analysis and review. **(c)** Sponsor must use real or constant dollars in their LCCA (omit the effects of inflation). **(d)** For AIP funded projects, the sponsor must use the 7% discount rate found in Paragraph 8b(1).of OMB Circular A-94, Guidelines and Discount Rates for Benefit-Cost Analysis of Federal Programs, instead of the real discount rate published annually in Appendix C of the same circular. The 7% rate is the rate that is prescribed by the Federal government for public investment, which is the standard by which AIP is judged. The 7% is based on historical long term trends and is not tied to current available rates. **(e)** The sponsor must not use a project life that exceeds 20 years. For options that have a service life that exceeds 20 years, the sponsor may include a salvage value for the life beyond 20 years. **(f)** If at the 30% design stage, a sponsor conducting a LCCA that results in a particular solution for which there is only one contractor has the option to bidding multiple solutions to establish competition.

Table U-8 AIP Handbook Clarification of 2 CFR § 200.320(c) - Procurement by Sealed Bids (Formal Advertising)

Clarifications include…
(9) Guidance for Conducting Life Cycle Cost Analyses. The following three documents provide useful guidance to sponsors. The first document is especially useful for sponsors who have never completed a life cycle cost analysis and would like a simplified primer. **(a)** Life-Cycle Cost Analysis Primer. **(b)** The current version of Advisory Circular 150/5320-6, Airport Pavement Design and Evaluation. **(c)** AAPTP 06-06, Life Cycle Cost Analysis for Airport Pavements.
(10) Limits on Using Life Cycle Cost Prior to Bidding. The practice of limiting what alternatives the sponsor will consider in their procurement action prior to bidding may unduly exclude an otherwise eligible alternative and is thus contrary to the fair and open requirements of 2 CFR § 200.319. Per FAA policy, the one exception to this limitation is the comparative analysis of pavement design alternatives. Due to additional design costs associated with multiple pavement design alternatives, sponsors have the option to select a pavement design alternative prior to the bid solicitation provided that sufficient competition exists for the selected alternative. Funding limitations for designing two pavement alternatives is discussed in Paragraph 3-46.

U-16. 2 CFR § 200.320(d) - Procurement by Competitive Proposals.

The following italicized text is directly quoted from 2 CFR part 200.

(d) Procurement by competitive proposals. The technique of competitive proposals is normally conducted with more than one source submitting an offer, and either a fixed price or cost-reimbursement type contract is awarded. It is generally used when conditions are not appropriate for the use of sealed bids. If this method is used, the following requirements apply:

(1) Requests for proposals must be publicized and identify all evaluation factors and their relative importance. Any response to publicized requests for proposals must be considered to the maximum extent practical;

(2) Proposals must be solicited from an adequate number of qualified sources;

(3) The non-Federal entity must have a written method for conducting technical evaluations of the proposals received and for selecting recipients;

(4) Contracts must be awarded to the responsible firm whose proposal is most advantageous to the program, with price and other factors considered; and

(5) The non-Federal entity may use competitive proposal procedures for qualifications-based procurement of architectural/engineering (A/E) professional services whereby competitors' qualifications are evaluated and the most qualified competitor is selected, subject to negotiation of fair and reasonable compensation. The method, where price is not used as a selection factor, can only be used in procurement of A/E professional services. It cannot be

used to purchase other types of services though A/E firms are a potential source to perform the proposed effort.

Table U-9 AIP Handbook Clarification of 2 CFR § 200.320(d) - Procurement by Competitive Proposals

Clarifications include…
(1) Clarifications for all Procurement Methods. Additional clarifications that apply to all procurement methods are contained in Paragraph U-12. These clarifications must be used in addition to the ones listed below.
(2) Difference between Sealed Bids and Competitive Proposals. The main difference between sealed bids and competitive proposals is that a sponsor awards sealed bids based principally on price, and awards competitive proposals based price *and/or* other factors (such as qualifications, contract time, proposed phasing, or method of construction).
(3) Common Types of Competitive Proposals in AIP. Design-build, construction manager-at-risk, qualification based, and any other alternative delivery methods are all considered to be competitive proposals. A competitive proposal may be a one step or a two-step process. A brief summary of the most common methods are discussed below. Clarification on EMAS procurement, which is a unique type of competitive proposal, is provided at the end of this table. **(a) Qualification Based with Negotiated Price (Professional Services).** This method is a qualifications based method that is required for professional services. Per 49 USC § 47107(a)(17), AIP must use a qualification based selection method under the Brooks Act for "program management, construction management, planning studies, feasibility studies, architectural services, preliminary engineering, design engineering, surveying, mapping, and related services." Per the Brooks Act, the competitor cannot provide (and the sponsor cannot use) price information when the sponsor ranks the competitors. The FAA interprets this to mean competitors cannot provide any price information before the sponsor determines the most qualified competitor, even if the price information is in a sealed envelope. However, the sponsor must then negotiate a fair and reasonable price or go to the next qualified competitor. The current version of Advisory Circular 150/5100-14, Architectural, Engineering, and Planning Consultant Services for Airport Grant Projects, provides further guidance. **(b) Design-Build.** 49 USC § 47142 establishes design-build contracting as an approvable form of contracting under AIP and defines it as "an agreement that provides for both design and construction of a project by a contractor". This section of the Act also requires that "three or more bids must be submitted". Section 139 of the Wendell H. Ford Aviation Investment and Reform Act for the 21st Century (AIR-21) established a pilot program design-build contracting under AIP, however, this pilot program expired September 30, 2003 and was replaced by the statute in 49 USC § 47142 per Vision 100 – Century of Aviation Reauthorization Act which made this type of contracting eligible outside of the pilot program. **(c) Construction Manager At Risk (CMAR).** Under CMAR, the sponsor engages a design firm for the project design. The sponsor selects a construction manager-at-risk (CMAR) based on qualifications and price (e.g. fee) early in the design phase. The CMAR conducts document reviews, constructability reviews, cost estimating and scheduling. The CMAR then competitively procures the construction component of the project and is responsible for ensuring the project is completed within budget and schedule.

Table U-9 AIP Handbook Clarification of 2 CFR § 200.320(d) - Procurement by Competitive Proposals

Clarifications include…
(4) Required Notification to ADO. If the procurement is expected to exceed the simplified acquisition threshold (provided in Table U-7) and is to be awarded without competition, or only one proposal is received in response to a solicitation, the sponsor must notify the ADO in writing prior to the award.
(5) Competitive Proposals Containing Ineligible Work. For competitive proposals the sponsor must select the proposal that is most advantageous to Federal interest and the sponsor must be able to clearly show how the ineligible and eligible costs are divided.
(6) Adequate Number of Qualified Sources. The FAA considers an adequate number of qualified sources to be two or more for competitive proposals, except for when the sponsor uses the design-build method, in which case three or more are required. If the sponsor is only able to obtain a quotation from one qualified source, then the sponsor must then follow sole source requirements.
(7) Written Method for Selection. The sponsor must have a written basis for selection prior to receiving proposals**.**
(8) Qualification Based With Negotiated Price (Consultant Contracts) Only: **(a) When Price must not be used as a Factor.** The only competitive proposal procedure where price cannot be used (only other factors) is for the qualifications based procurement of architectural/engineering professional services. **(b) Consultant Contract Requirements.** The current version of Advisory Circular 150/5100-14, Architectural, Engineering, and Planning Consultant Services for Airport Grant Projects, provides sponsor requirements for consulting contracts, including the unique contract methods (retainers, cost-plus-a-fixed-fee, cost-plus-a-percentage-of-cost, indefinite delivery). Sponsor must not deviate from the requirements in this advisory circular unless the ADO has reviewed the contract and concurs with the deviations. Note that cost-plus-a-percentage-of-cost is specifically prohibited per 2 CFR § 200.323(d). In addition, if the sponsor uses cost-plus-a-fixed-fee, it is FAA policy that profit must be based on a value, not on a multiplier or percentage. For lump sum contracts, it is FAA policy that the negotiation process must clearly show the amount of profit and how it was derived.
(9) Design Build And Construction Manager-At-Risk (And Any Other Competitive Proposal Not Qualification Based With Negotiated Price): **(a) Clarifications for Sealed Bids.** Since these proposals use price as a factor, the clarifications under sealed bids contained in Paragraph U-15 also apply. **(b) When the Use of Sealed Bids Alone is Not Appropriate.** The sponsor must only use sealed bids instead of competitive proposals unless: **(i)** A complete, adequate, and realistic specification or purchase description is not available (for instance, a complex project contains too many unknowns). **(ii)** The procurement does not lend itself to a firm fixed price contract and the selection of the successful bidder cannot be made principally on the basis of price.

Table U-9 AIP Handbook Clarification of 2 CFR § 200.320(d) - Procurement by Competitive Proposals

Clarifications include…
(c) Example of Situations where Competitive Proposals may be Appropriate. Examples include complex terminal projects (where there are multiple methods of construction and phasing), large demolition projects (where there are multiple methods of demolition), and rehabilitation of runway crossings (where contract time, phasing, or method may have added benefits). In order for the sponsor to consider using competitive proposals, the sponsor must first determine that sealed bids *cannot* be used. **(d) Advantages of Competitive Proposals that are not Allowed under AIP.** Because of the Federal contract and procurement requirements, some of the advantages of competitive proposals are not eligible for AIP funding. Sponsors must still meet all applicable 2 CFR §§ 200.317-200.326 and AIP requirements in order for the ADO to fund the costs with AIP. Examples of some costs that are not allowed include early completion bonuses, cost overruns greater than the allowable grant amendment percent, shared costs savings, contingency costs, price escalation, consultant and airport insurance costs, and state and local preferences. **(e) Obtaining ADO Concurrence Prior to Award.** Per 49 USC § 47142, the sponsor must not award AIP funded design build proposals prior to obtaining ADO concurrence. Per FAA policy, this also applies to construction manager-at-risk proposals (and any other competitive proposals not qualifications based with negotiated price). **(f) Submittal of Technical Specifications to ADO**. Per 2 CFR § 200.324(a), sponsors must submit all technical specifications to the ADO upon the ADO's request. This may include the plans, the specifications, the engineer's report, and any other items that make up the procurement package. **(g) Submittal of Additional Documentation.** The sponsor must provide all additional documentation required by the ADO, which for these types of proposals includes, but is not limited to: **(i)** A description of the method to be used. **(ii)** A full description of the project with general sketches of proposed work. **(iii)** Documentation that provides the reason and justification for using the competitive proposal method over sealed bids. **(iv)** A responsibility matrix showing the contractual relationships between all parties involved in the project. A flowchart is often useful for this purpose. **(v)** Documentation that the selection process is allowed under state or local law. **(vi)** A statement describing what safeguards are in place to prevent conflicts of interest. **(vii)** Proof that the system will be as open, fair and objective as the traditional sealed bid method under 2 CFR § 200.320(c). **(viii)** Documentation of the amount of experience the parties involved in the project have in the proposed method.
(10) Engineered Materials Arresting Systems (EMAS) Procurement. **(a) Procurement Requirement Background.** Prior to April 2012, there was only one manufacturer whose product meets the requirements of the current version of Advisory Circular 150/5220-22, Engineered Materials Arresting Systems (EMAS) for Aircraft Overruns. As of the

Table U-9 AIP Handbook Clarification of 2 CFR § 200.320(d) - Procurement by Competitive Proposals

Clarifications include…
date of this publication, two manufacturers meet these requirements. Therefore, the sponsor must procure the EMAS project under the competitive proposal procurement method that bases the award on price plus other factors, such as phasing, design factors, or total contract time. **(b) Exception for Competitive Proposal Procurement.** The exception on using the competitive procurement method for EMAS is when an EMAS design project is currently under design on the date of Change 1 of this Handbook and the design is beyond 30 percent. In this case, the ADO has the option of allowing the sponsor to use the noncompetitive proposal method to procure the EMAS acquisition and installation. **(c) Request for Information (RFI).** The sponsor is allowed to issue a Request for Information (RFI) to obtain conceptual designs from EMAS vendors. The RFI is issued solely for informational purposes and is not a solicitation. Similarly, responses to RFI's are not offers from the EMAS vendors. **(d) Request for Proposal (RFP) Requirements**. At a minimum, the RFP must contain the following information: **(i)** A description of the project. **(ii)** An existing site drawing showing topography, utilities and structures. **(iii)** Preliminary site design information that will affect the design of the EMAS bed. Examples include: RSA available dimensions, proposed grades, new drainage structures, runway/taxiway extensions, new approach light stations. **(iv)** The current and future (if different from current) fleet mix. Future fleet mixes must be based on terminal area forecasts approved by the ADO. **(v)** All evaluation criteria. **(e) Evaluation Criteria.** **(i)** Proposals demonstrating, through design, that they can meet the requirements for a standard EMAS (70 knot stopping capability for the design aircraft), will take precedence over proposals not demonstrating that they can meet the requirements for a standard EMAS **(ii)** If all of the proposals are unable to demonstrate that they can meet the requirements for a standard EMAS, but still demonstrate that they can meet the requirements for a non-standard EMAS (minimum of 40 knot stopping capability for the design aircraft), the Sponsor must apply the following rating method for relative importance for these primary categories: a. Stopping capability of aircraft within the fleet mix (50% weighting) b. Cost of the bed (40% weighting) c. Maintenance requirements and costs of the bed annually over the design life (5% weighting d. Other unique local conditions, such as severe occurrences of jet blast and environmental and operational impact of the EMAS footprint (5% weighting) **(iii)** The Sponsor may provide additional detailed evaluation criteria, such as ability to meet project schedule and any applicable and unique goal requirements, but must use the

Table U-9 AIP Handbook Clarification of 2 CFR § 200.320(d) - Procurement by Competitive Proposals

Clarifications include…
primary categories listed above. The rating method does not need to be included in the RFP. **(f) Vendor Proposal Requirements.** The proposals from the vendors must contain the following information: **(i)** The specifications of the proposed EMAS. **(ii)** An updated preliminary site plan drawing that shows the actual dimensions of the proposed EMAS footprint and any changes to the sponsor's provided site design. **(iii)** A description of the product performance assessment and modeling process. **(iv)** Details on the profile and cross sections of the EMAS including grade. **(v)** Preliminary calculations for the stopping capability of aircraft within the fleet mix of operation (the highest runway exit speed for each aircraft that can be arrested within the bed). **(vi)** The cost of the EMAS bed. The cost must be submitted based upon the firm fixed price contract method for all EMAS, installation materials, and self-inspection, testing and administration. Payment for materials will be made upon delivery to the site. At the Sponsor's option, the Sponsor may allow the costs for construction inspection, by the vendor or its representative, to be broken out separately using the cost plus fixed fee method of contract pricing. All shipping, storage and travel costs must be included in the firm fixed price. **(vii)** The schedule for material delivery. **(viii)** Annual maintenance cost and requirements of the EMAS over the life of the product. **(g) Sponsor Evaluation.** The sponsor must review, evaluate, and rate each proposal based on the criteria in the RFP. The sponsor's review must result in the selection of a responsible vendor whose proposal is the most advantageous to the project. The sponsor must give precedence to proposals that provide a standard EMAS over those that do not. For proposals with a standard EMAS, the sponsor must award to the lowest responsible, responsive bidder, with respect to the cost of the EMAS bed. **(h) EMAS Bed Replacements and Retrofits.** If the ADO concurs that an existing bed must be replaced, then the procurement requirements for new EMAS installation apply. The sponsor must follow the competitive procurement process to select the vendor. In order for a sponsor to retrofit an EMAS with the original vendor, the sponsor must submit documentation to the ADO showing that the bed can only be modified or retrofitted by the original vendor and that the cost benefit of replacing the bed outweighs the cost benefit of retrofit. The retrofitting project cannot be funded without ADO concurrence.

U-17. 2 CFR § 200.320(e) - Reserved.

The following italicized text is directly quoted from 2 CFR part 200.

(e) [Reserved]

U-18. 2 CFR § 200.320(f) - Procurement by Noncompetitive Proposals.

The following italicized text is directly quoted from 2 CFR part 200.

(f) Procurement by noncompetitive proposals. Procurement by noncompetitive proposals is procurement through solicitation of a proposal from only one source and may be used only when one or more of the following circumstances apply:

(1) The item is available only from a single source;

(2) The public exigency or emergency for the requirement will not permit a delay resulting from competitive solicitation;

(3) The Federal awarding agency or pass-through entity expressly authorizes noncompetitive proposals in response to a written request from the non-Federal entity; or

(4) After solicitation of a number of sources, competition is determined inadequate.

Table U-10 AIP Handbook Clarification of 2 CFR § 200.320(f) - Procurement by Noncompetitive Proposals 2 CFR § 200.320(f) - Procurement by Noncompetitive Proposals

Clarifications include…
(1) Clarifications for all Procurement Methods. Additional clarifications that apply to all procurement methods are contained in Paragraph U-12. These clarifications must be used in addition to the ones listed below.
(2) Single Source, Sole Source, and Proposals with an Inadequate Number of Qualified Sources. Single source, sole source, and proposals with an inadequate number of qualified sources are noncompetitive. The number of adequate qualified sources is found in Table U-7 for small purchase proposals and Table U-9 for competitive proposals.
(3) Contract Changes. Change orders, supplemental agreements, and contract modifications are noncompetitive. The sponsor and ADO requirements are included in Paragraph 5-35.
(4) Cost Analysis. Per FAA policy, the sponsor must prepare a written cost analysis for noncompetitive procurement proposals.
(5) Required Notification to ADO. If the sponsor procures using noncompetitive proposals, makes a contract modification that changes the scope of a contract, or increases the contract amount by more than the simplified acquisition threshold (provided in Table U-7), the sponsor must notify the ADO in writing prior to executing the procurement action.
(6) Submittal of Technical Specifications to ADO. Per 2 CFR § 200.324(a), sponsors must submit all technical specifications to the ADO upon the ADO's request. This may include the plans, the specifications, the engineer's report, cost analysis, and any other items that make up the procurement package.

Table U-10 AIP Handbook Clarification of 2 CFR § 200.320(f) - Procurement by Noncompetitive Proposals 2 CFR § 200.320(f) - Procurement by Noncompetitive Proposals

Clarifications include…
(7) Example where Noncompetitive Proposals may be Appropriate. **(a) Some Services for Less than $10,000.** Services for $10,000 or less for appraisals, grant audit services performed as a part of a project, and Independent project cost estimates. The $10,000 was set by FAA policy in Advisory Circular 150/5100-14, Architectural, Engineering, and Planning Consultant Services for Airport Grant Projects. **(b) Public utility company services.** Public utility companies generally do not allow work on their property or equipment by anyone other than their own employees. A sponsor often has no other choice than to use a noncompetitive proposal for this type of work. In addition, the FAA has determined that the Federal contract provisions do not apply to this situation. **(c) Eligible replacement of a component of a piece of equipment.** This may be allowable if using a competitor's replacement part would make the equipment inoperable, such as during a rehabilitation of an ARFF vehicle. The sponsor must document their justification and make it available to the ADO upon request.
(8) Example where Noncompetitive Proposals may not be Appropriate. **(a) Sponsor convenience**. Sponsors must not use a noncompetitive proposal to ensure consistency of equipment, to improve spare parts management, or to work with companies they have experience with. **(b) Compatibility with nonstandard features.** If a sponsor purchased equipment with nonstandard features that were not required by the FAA, then the sponsor cannot use compatibility as justification for using noncompetitive procurement. An example is when a sponsor purchases an airfield lighting control panel that includes remote maintenance monitoring, which is not required by the FAA. The sponsor cannot limit the procurement of future regulators to only those regulators that support the nonstandard remote maintenance monitoring.
(9) Noncompetitive Proposals. If a sponsor is using a noncompetitive proposal, a modification to standards may be required. The requirements for a modification to standard are outlined in Paragraph 3-23.

Table U-10 AIP Handbook Clarification of 2 CFR § 200.320(f) - Procurement by Noncompetitive Proposals 2 CFR § 200.320(f) - Procurement by Noncompetitive Proposals

Clarifications include…
(10) Separating Noncompetitive and Competitive Procurement. Per FAA policy, sponsors must separate noncompetitive and competitive procurement because it may limit the free and open competition of the competitive procurement. Four examples where sponsors must separate procurement include changes to existing Airfield Lighting Control and Monitoring Systems (ALCMS), certified airfield lighting equipment with only one manufacturer,. sponsor preferred airfield lighting equipment, and certified airfield lighting equipment that is prohibited from AIP funding. Requirements include: **(a)** The sponsor must notify the ADO in writing before the noncompetitive procurement begins. **(b)** The notification must include the schedule for both procurements. These schedules must indicate that the equipment procurement will be completed before the overall AIP project procurement begins. **(c)** The sponsor must acknowledge in the notification that not all costs will be eligible for reimbursement with AIP funding (see Paragraph 3-93 for the reimbursement rules). **(d)** The sponsor must complete the noncompetitive procurement before the overall AIP project procurement begins.

U-19. 2 CFR § 200.321 - Contracting with Small and Minority Businesses, Women's Business Enterprises, and Labor Surplus Area Firms.

The following italicized text is directly quoted from 2 CFR part 200.

§ 200.321Contracting with small and minority businesses, women's business enterprises, and labor surplus area firms.

(a) The non-Federal entity must take all necessary affirmative steps to assure that minority businesses, women's business enterprises, and labor surplus area firms are used when possible.

(b) Affirmative steps must include:

(1) Placing qualified small and minority businesses and women's business enterprises on solicitation lists;

(2) Assuring that small and minority businesses, and women's business enterprises are solicited whenever they are potential sources;

(3) Dividing total requirements, when economically feasible, into smaller tasks or quantities to permit maximum participation by small and minority businesses, and women's business enterprises;

(4) Establishing delivery schedules, where the requirement permits, which encourage participation by small and minority businesses, and women's business enterprises;

(5) Using the services and assistance, as appropriate, of such organizations as the Small Business Administration and the Minority Business Development Agency of the Department of Commerce; and

(6) Requiring the prime contractor, if subcontracts are to be let, to take the affirmative steps listed in paragraphs (1) through (5) of this section.

Table U-11 AIP Handbook Clarification of 2 CFR § 200.321, Contracting with Small and Minority Businesses, Women's Business Enterprises, and Labor Surplus Area Firms

Clarifications include…
(1) Disadvantaged Business Enterprise and Bid Responsiveness. The Small and Minority, Women's Business Enterprise (MWBE) and labor surplus area programs are distinct from the Disadvantaged Business Enterprise (DBE) program (which is a DOT program and a requirement for AIP). A sponsor is allowed to include aspirational goals in bid documents, as well as race-neutral small business set-asides per 49 CFR § 26.39. However, it is FAA policy, based on 49 CFR part 26, that the sponsor cannot use any goals other than DBE to determine bid responsiveness. Local goals for MWBE and labor surplus area programs may not be included on an AIP project.
(2) Other Civil Rights Requirements Outside of 2 CFR §§ 200.317-200.326. Sponsors are also required to follow the other civil rights requirements for AIP projects, such as those found in 49 CFR part 26.

U-20. 2 CFR § 200.322 - Procurement of Recovered Materials.

The following italicized text is directly quoted from 2 CFR part 200.

§ 200.322 Procurement of recovered materials.

A non-Federal entity that is a state agency or agency of a political subdivision of a state and its contractors must comply with section 6002 of the Solid Waste Disposal Act, as amended by the Resource Conservation and Recovery Act. The requirements of Section 6002 include procuring only items designated in guidelines of the Environmental Protection Agency (EPA) at 40 CFR part 247 that contain the highest percentage of recovered materials practicable, consistent with maintaining a satisfactory level of competition, where the purchase price of the item exceeds $10,000 or the value of the quantity acquired by the preceding fiscal year exceeded $10,000; procuring solid waste management services in a manner that maximizes energy and resource recovery; and establishing an affirmative procurement program for procurement of recovered materials identified in the EPA guidelines.

Table U-12 AIP Handbook Clarification of 2 CFR § 200.322 - Procurement of Recovered Materials

Clarifications include…
(1) New Requirement Per 2 CFR § 200.
(2) Clarification from Section 6002(c)(1) of the Resource Conservation and Recovery Act. Sponsors may decide not to procure recovered material if they are not reasonably available in a reasonable period of time; fail to meet reasonable performance standards; or are only available at an unreasonable price.
(3) Listing of Recovered Materials. A listing is available in 40 CFR § 247.3.

U-21. 2 CFR § 200.323, Contract Cost and Price.

The following italicized text is directly quoted from 2 CFR part 200.

§ 200.323 Contract cost and price.

(a) The non-Federal entity must perform a cost or price analysis in connection with every procurement action in excess of the Simplified Acquisition Threshold including contract modifications. The method and degree of analysis is dependent on the facts surrounding the particular procurement situation, but as a starting point, the non-Federal entity must make independent estimates before receiving bids or proposals.

(b) The non-Federal entity must negotiate profit as a separate element of the price for each contract in which there is no price competition and in all cases where cost analysis is performed. To establish a fair and reasonable profit, consideration must be given to the complexity of the work to be performed, the risk borne by the contractor, the contractor's investment, the amount of subcontracting, the quality of its record of past performance, and industry profit rates in the surrounding geographical area for similar work.

(c) Costs or prices based on estimated costs for contracts under the Federal award are allowable only to the extent that costs incurred or cost estimates included in negotiated prices would be allowable for the non-Federal entity under Subpart E—Cost Principles of this part. The non-Federal entity may reference its own cost principles that comply with the Federal cost principles.

(d) The cost plus a percentage of cost and percentage of construction cost methods of contracting must not be used.

Table U-13 AIP Handbook Clarification of 2 CFR § 200.323 - Contract Cost and Price

Clarifications include…

(1) Price or Cost Analysis is a Mandatory Sponsor Action. Sponsors are required to perform a cost or price analysis for every procurement action that uses AIP funds, including contract modifications. Per FAA policy, this includes all procurement actions including contract modifications that are below the simplified acquisition threshold (provided in Table U-7). The only exception is for micro-purchases discussed in Paragraph U-13).

(2) Application to Professional Services Contracts. Professional service contracts (such as engineering or consultant contracts) are considered *for-profit firms* and therefore the contract cost and price principles in 48 CFR part 31 (not 2 CFR § 200.323) apply.

(3) Contract Modifications. Contract modifications include such items as change orders to construction/equipment contracts and supplemental agreements to negotiated professional service contracts. Contract modifications that change the original scope of the project and do not have a line item in the original bid require a full cost analysis. Otherwise, the sponsor can perform a price analysis by simply documenting that the unit prices are consistent with those in the original contract and/or that the changes are necessary to complete the original scope of the work.

(4) Independent Estimate. The independent estimate methods by project type are included below. These estimates are the initial tool for the sponsor to use in price and cost analyses.

For the following project type…	The independent estimate method is…
Land and easement acquisition	Appraisals and review appraisals
Equipment acquisition and construction	Engineer's estimate
Negotiated professional services (such as consultant costs)	Independent fee estimate
Non-negotiated services (such as newspaper advertisements and rental of facilities for a public hearing)	Advertised pricing
Non-negotiated service based on law or regulation (such as utility work by the utility company or a reimbursable agreement with the FAA Air Traffic Organization (ATO))	Not applicable

(5) Cost Analysis Purpose. A cost analysis is the evaluation of separate elements such as labor or materials that make up the total price to determine if the separate elements are allowable, directly related to the project, and reasonable.

(6) Price Analysis Purpose. A price analysis is a process analyzing a proposed total price without evaluating separate cost elements (including profit). The purpose is solely to ensure that a total price is fair and reasonable.

Table U-13 AIP Handbook Clarification of 2 CFR § 200.323 - Contract Cost and Price

Clarifications include…
(7) Cost Analysis vs. Price Analysis. Cost analysis is used in instances where a price analysis is not viable (instances listed 2 CFR § 200.323(a)) and requires evaluation of the individual elements of cost that make up the total price. Price analysis is based solely on the total price.
(8) How to do a Cost or Price Analysis. There are a number of publically-available documents on preparing a cost analysis. DOD's Contract Pricing Reference Guides is an excellent source. Another good source is the Quick Guide to Cost and Price Analysis for HUD Grantees and Funding Recipients, United States Department of Housing and Urban Development. Because HUD has similar grant requirements for their grantees as AIP does for sponsors, the requirements are very similar to those of AIP. References and links for these documents are included in Appendix B.
(9) File Retention. Sponsors must retain a copy of the price or cost analysis in the sponsor's files.
(10) Documentation to the ADO. Sponsors must submit all cost and price analysis documentation to the ADO upon request as required in Section 14 of Chapter 3.
(11) Negotiation of Profit. Sponsor must remember to include this step as a separate action for all of the situations outlined in 2 CFR § 200.323(b) (including change orders).
(12) Contract Bonus for Expedited Construction Completion. Contracts sometimes provide for payment of a bonus to the contractor for completing construction early or a phase of the construction early. A sponsor can include a bonus clause in a contract on an AIP project, however, AIP cannot fund the bonus payment.
(13) Escalator Clauses. Escalator clauses are provisions in a contract for increasing or decreasing the contracted price for labor, material, etc., in step with the market prices or an agreed upon benchmark. Sponsors must send their request to the ADO and obtain written APP-1 approval before awarding contracts containing an escalator clause.
(14) Required Prior Notification to ADO. If the sponsor makes a contract modification that changes the scope of a contract or increases the contract amount by more than the simplified acquisition threshold (provided in Table U-7), the sponsor must notify the ADO in writing prior to executing the procurement action.

U-22. 2 CFR § 200.324 - Federal Awarding Agency or Pass-Through Entity Review.

The following italicized text is directly quoted from 2 CFR part 200.

§ 200.324 Federal awarding agency or pass-through entity review.

(a) The non-Federal entity must make available, upon request of the Federal awarding agency or pass-through entity, technical specifications on proposed procurements where the Federal awarding agency or pass-through entity believes such review is needed to ensure that the item or service specified is the one being proposed for acquisition. This review generally will take place

prior to the time the specification is incorporated into a solicitation document. However, if the non-Federal entity desires to have the review accomplished after a solicitation has been developed, the Federal awarding agency or pass-through entity may still review the specifications, with such review usually limited to the technical aspects of the proposed purchase.

(b) The non-Federal entity must make available upon request, for the Federal awarding agency or pass-through entity pre-procurement review, procurement documents, such as requests for proposals or invitations for bids, or independent cost estimates, when:

(1) The non-Federal entity's procurement procedures or operation fails to comply with the procurement standards in this part;

(2) The procurement is expected to exceed the Simplified Acquisition Threshold and is to be awarded without competition or only one bid or offer is received in response to a solicitation;

(3) The procurement, which is expected to exceed the Simplified Acquisition Threshold, specifies a "brand name" product;

(4) The proposed contract is more than the Simplified Acquisition Threshold and is to be awarded to other than the apparent low bidder under a sealed bid procurement; or

(5) A proposed contract modification changes the scope of a contract or increases the contract amount by more than the Simplified Acquisition Threshold.

(c) The non-Federal entity is exempt from the pre-procurement review in paragraph (b) of this section if the Federal awarding agency or pass-through entity determines that its procurement systems comply with the standards of this part.

(1) The non-Federal entity may request that its procurement system be reviewed by the Federal awarding agency or pass-through entity to determine whether its system meets these standards in order for its system to be certified. Generally, these reviews must occur where there is continuous high-dollar funding, and third party contracts are awarded on a regular basis;

(2) The non-Federal entity may self-certify its procurement system. Such self-certification must not limit the Federal awarding agency's right to survey the system. Under a self-certification procedure, the Federal awarding agency may rely on written assurances from the non-Federal entity that it is complying with these standards. The non-Federal entity must cite specific policies, procedures, regulations, or standards as being in compliance with these requirements and have its system available for review.

Table U-14 AIP Handbook Clarification of 2 CFR § 200.324 - Federal Awarding Agency or Pass-Through Entity Review

Clarifications include…
(1) ADO Responsibilities. The ADO procurement responsibilities are discussed in detail in Section 10 of Chapter 3. The ADO always has the option of reviewing any sponsor procurement documents and systems at any time during the grant process.
(2) Required Sponsor Notifications to the ADO. It is FAA policy that the sponsor must notify the ADO when any of the situations listed in 2 CFR § 200.324(b) exist. The ADO then has the option to require the sponsor to provide further documentation or to conduct a pre-award review.

U-23. 2 CFR § 200.325 - Bonding Requirements.

The following italicized text is directly quoted from 2 CFR part 200.

§ 200.325 Bonding requirements.

For construction or facility improvement contracts or subcontracts exceeding the Simplified Acquisition Threshold, the Federal awarding agency or pass-through entity may accept the bonding policy and requirements of the non-Federal entity provided that the Federal awarding agency or pass-through entity has made a determination that the Federal interest is adequately protected. If such a determination has not been made, the minimum requirements must be as follows:

(a) A bid guarantee from each bidder equivalent to five percent of the bid price. The "bid guarantee" must consist of a firm commitment such as a bid bond, certified check, or other negotiable instrument accompanying a bid as assurance that the bidder will, upon acceptance of the bid, execute such contractual documents as may be required within the time specified.

(b) A performance bond on the part of the contractor for 100 percent of the contract price. A "performance bond" is one executed in connection with a contract to secure fulfillment of all the contractor's obligations under such contract.

(c) A payment bond on the part of the contractor for 100 percent of the contract price. A "payment bond" is one executed in connection with a contract to assure payment as required by law of all persons supplying labor and material in the execution of the work provided for in the contract.

Table U-15 AIP Handbook Clarification of 2 CFR § 200.325 - Bonding requirements

Clarifications include…
(1) Contracts at or below the Simplified Acquisition Threshold (provided in Table U-7). Sponsors have the option to follow their own requirements relating to bid guarantees, performance bonds, and payment bonds for construction if the contract or subcontract is at or below the simplified acquisition threshold (provided in Table U-7).
(2) Maintenance Bonds and Extended Warrantees. Maintenance bonds and extended warrantees are not required under 2 CFR § 200.325 and cannot be funded under AIP. If a sponsor chooses to require a maintenance bond or an extended warrantee, then the sponsor must clearly bid that item separately and not include the costs in the AIP project.
(3) Requirements for Nonstandard Bonding. If the sponsor deviates from the minimum bonding requirements, the sponsor must submit a written assurance to the ADO that the Federal interests are adequately protected.
(4) Combined Payment and Performance Bonds. A combined payment and performance bond does *not* meet the minimum requirements and must not be used unless sponsor has submitted a written assurance to the ADO that the Federal interests are adequately protected.
(5) Bonding for Equipment Procurement Projects (no construction included in project). For an AIP project that is solely to acquire equipment, with no associated construction of any kind, by FAA policy, the decision to require bonds (or not) is at the discretion of the sponsor.

U-24. 2 CFR § 200.326 - Contract provisions.

The following italicized text is directly quoted from 2 CFR part 200.

§ 200.326 Contract provisions.

The non-Federal entity's contracts must contain the applicable provisions described in Appendix II to Part 200—Contract Provisions for non-Federal Entity Contracts Under Federal Awards.

Appendix II to Part 200—Contract Provisions for Non-Federal Entity Contracts Under Federal Awards

In addition to other provisions required by the Federal agency or non-Federal entity, all contracts made by the non-Federal entity under the Federal award must contain provisions covering the following, as applicable.

(A) Contracts for more than the simplified acquisition threshold currently set at $150,000, which is the inflation adjusted amount determined by the Civilian Agency Acquisition Council and the Defense Acquisition Regulations Council (Councils) as authorized by 41 U.S.C. 1908, must address administrative, contractual, or legal remedies in instances where contractors violate or breach contract terms, and provide for such sanctions and penalties as appropriate.

(B) All contracts in excess of $10,000 must address termination for cause and for convenience by the non-Federal entity including the manner by which it will be effected and the basis for settlement.

(C) Equal Employment Opportunity. Except as otherwise provided under 41 CFR Part 60, all contracts that meet the definition of "federally assisted construction contract" in 41 CFR Part 60-1.3 must include the equal opportunity clause provided under 41 CFR 60-1.4(b), in accordance with Executive Order 11246, "Equal Employment Opportunity" (30 FR 12319, 12935, 3 CFR Part, 1964-1965 Comp., p. 339), as amended by Executive Order 11375, "Amending Executive Order 11246 Relating to Equal Employment Opportunity," and implementing regulations at 41 CFR part 60, "Office of Federal Contract Compliance Programs, Equal Employment Opportunity, Department of Labor."

(D) Davis-Bacon Act, as amended (40 U.S.C. 3141-3148). When required by Federal program legislation, all prime construction contracts in excess of $2,000 awarded by non-Federal entities must include a provision for compliance with the Davis-Bacon Act (40 U.S.C. 3141-3144, and 3146-3148) as supplemented by Department of Labor regulations (29 CFR Part 5, "Labor Standards Provisions Applicable to Contracts Covering Federally Financed and Assisted Construction"). In accordance with the statute, contractors must be required to pay wages to laborers and mechanics at a rate not less than the prevailing wages specified in a wage determination made by the Secretary of Labor. In addition, contractors must be required to pay wages not less than once a week. The non-Federal entity must place a copy of the current prevailing wage determination issued by the Department of Labor in each solicitation. The decision to award a contract or subcontract must be conditioned upon the acceptance of the wage determination. The non-Federal entity must report all suspected or reported violations to the Federal awarding agency. The contracts must also include a provision for compliance with the Copeland "Anti-Kickback" Act (40 U.S.C. 3145), as supplemented by Department of Labor regulations (29 CFR Part 3, "Contractors and Subcontractors on Public Building or Public Work Financed in Whole or in Part by Loans or Grants from the United States"). The Act provides that each contractor or subrecipient must be prohibited from inducing, by any means, any person employed in the construction, completion, or repair of public work, to give up any part of the compensation to which he or she is otherwise entitled. The non-Federal entity must report all suspected or reported violations to the Federal awarding agency.

(E) Contract Work Hours and Safety Standards Act (40 U.S.C. 3701-3708). Where applicable, all contracts awarded by the non-Federal entity in excess of $100,000 that involve the employment of mechanics or laborers must include a provision for compliance with 40 U.S.C. 3702 and 3704, as supplemented by Department of Labor regulations (29 CFR Part 5). Under 40 U.S.C. 3702 of the Act, each contractor must be required to compute the wages of every mechanic and laborer on the basis of a standard work week of 40 hours. Work in excess of the standard work week is permissible provided that the worker is compensated at a rate of not less than one and a half times the basic rate of pay for all hours worked in excess of 40 hours in the work week. The requirements of 40 U.S.C. 3704 are applicable to construction work and provide that no laborer or mechanic must be required to work in surroundings or under working conditions which are unsanitary, hazardous or dangerous. These requirements do not apply to the purchases of supplies or materials or articles ordinarily available on the open market, or contracts for transportation or transmission of intelligence.

(F) Rights to Inventions Made Under a Contract or Agreement. If the Federal award meets the definition of "funding agreement" under 37 CFR § 401.2 (a) and the recipient or subrecipient wishes to enter into a contract with a small business firm or nonprofit organization regarding the substitution of parties, assignment or performance of experimental, developmental, or research work under that "funding agreement," the recipient or subrecipient must comply with the requirements of 37 CFR Part 401, "Rights to Inventions Made by Nonprofit Organizations and Small Business Firms Under Government Grants, Contracts and Cooperative Agreements," and any implementing regulations issued by the awarding agency.

(G) Clean Air Act (42 U.S.C. 7401-7671q.) and the Federal Water Pollution Control Act (33 U.S.C. 1251-1387), as amended—Contracts and subgrants of amounts in excess of $150,000 must contain a provision that requires the non-Federal award to agree to comply with all applicable standards, orders or regulations issued pursuant to the Clean Air Act (42 U.S.C. 7401-7671q) and the Federal Water Pollution Control Act as amended (33 U.S.C. 1251-1387). Violations must be reported to the Federal awarding agency and the Regional Office of the Environmental Protection Agency (EPA).

(H) Mandatory standards and policies relating to energy efficiency which are contained in the state energy conservation plan issued in compliance with the Energy Policy and Conservation Act (42 U.S.C. 6201).

(I) Debarment and Suspension (Executive Orders 12549 and 12689)—A contract award (see 2 CFR 180.220) must not be made to parties listed on the governmentwide Excluded Parties List System in the System for Award Management (SAM), in accordance with the OMB guidelines at 2 CFR 180 that implement Executive Orders 12549 (3 CFR Part 1986 Comp., p. 189) and 12689 (3 CFR Part 1989 Comp., p. 235), "Debarment and Suspension." The Excluded Parties List System in SAM contains the names of parties debarred, suspended, or otherwise excluded by agencies, as well as parties declared ineligible under statutory or regulatory authority other than Executive Order 12549.

(J) Byrd Anti-Lobbying Amendment (31 U.S.C. 1352)—Contractors that apply or bid for an award of $100,000 or more must file the required certification. Each tier certifies to the tier above that it will not and has not used Federal appropriated funds to pay any person or organization for influencing or attempting to influence an officer or employee of any agency, a member of Congress, officer or employee of Congress, or an employee of a member of Congress in connection with obtaining any Federal contract, grant or any other award covered by 31 U.S.C. 1352. Each tier must also disclose any lobbying with non-Federal funds that takes place in connection with obtaining any Federal award. Such disclosures are forwarded from tier to tier up to the non-Federal award.

(K) See § 200.322 Procurement of recovered materials.

Table U-16 AIP Handbook Clarification of 2 CFR § 200.326 - Contract Provisions
2 CFR § 200.326 - Contract provisions

Clarifications include…
(1) Additional Clauses and Provisions for AIP Projects and Obligated Sponsors. Appendix II of 2 CFR part 200 (as referenced by 2 CFR § 200.326 does not contain all of the required clauses and provision for AIP projects and obligated sponsors. There are other regulations and statutes that establish additional clauses and provisions. A consolidated listing of required clauses and provision for AIP projects and obligated sponsors is contained in Contract Provision Guidelines for Obligated Sponsors and Airport Improvement Program Projects (see Appendix B for link).
(2) Explanation of Apparent Conflict in Contract Levels between 40 USC § 3701, et seq. and 2 CFR part 200, Appendix II (E). The Contract Work Hours and Safety Standards Act contract provision applies to all contracts in excess of $100,000 that involve labor based on the following: **(a)** The Contract Work Hours and Safety Standards Act is codified at 40 USC § 3701, et seq. **(b)** The Act applies to sponsor contracts and subcontracts "financed at least in part by loans or grants from… the [Federal] Government." This is based on 40 USC § 3701(b)(1)(B)(iii) and (b)(2); 29 CFR § 5.2(h); and 2 CFR part 200, Appendix II (E). **(c)** Although the original Act required its application in any construction contract over $2,000 or non-construction contract to which the Act applied over $2,500 (and language to that effect is still found in 2 CFR part 200, Appendix II (E)), the Act no longer applies to any "contract in an amount that is not greater than $100,000". This is based on 40 USC § 3701(b)(3)(A)(iii)).
(3) Requirement to Include these Contract Provisions into AIP Funded Project Contracts. The sponsor must physically incorporate these contract provisions in each contract funded under AIP. The sponsor must require the contractor (or subcontractor) to insert these contract provisions in each subcontract and further require its inclusion in all lower tier subcontracts (excluding purchase orders, rental agreements and other agreements for supplies or services). **(a)** The sponsor must require the contractor to incorporate applicable requirements of these contract provisions by reference for work done under any purchase orders, rental agreements and other agreements for supplies or services. The prime contractor is responsible for compliance by any subcontractor, lower-tier subcontractor or service provider. **(b)** Subject to the applicability criteria noted in the specific contractor provisions, these contract provisions apply to all work performed on the contract by the contractor's own organization and with the assistance of workers under the contractor's immediate supervision and to all work performed on the contract by piecework, station work, or by subcontract. **(c)** A breach of any of the stipulations contained in these required contract provisions may be sufficient grounds for withholding of progress payments, withholding of final payment, termination of the contract, suspension/debarment or any other action determined to be appropriate by the sponsor and AIP.
(4) Byrd Anti-Lobbying Amendment. This amendment, which is covered in 2 CFR part 200, Appendix II (J) is also covered under 49 CFR part 20.

Appendix V. Revenue Sources for the Airport and Airway Trust Fund

V-1. General.

The Airport and Airway Trust Fund, which was established by the Airport and Airway Revenue Act of 1970, provides the revenues used to fund AIP projects. The Trust Fund receives revenues from a series of excise taxes paid by users of the national airspace system. The excise taxes are associated with purchases of airline tickets and aviation fuel, as well as the shipment of cargo. Table V-1 lists these tax sources and how they are computed. The current tax structure is established under the Taxpayer Relief Act of 1997 (Public Law 105-35). Information on the Trust Fund can be found from the FAA Office of Policy, International Affairs and Environment website.

Table V-1 lists these tax sources and how they are computed.

Table V-1 Revenue Sources for the Airport and Airway Trust Fund

Aviation Taxes	Comment	Tax Rate
a. Domestic Passenger Ticket Tax (including areas of Canada and Mexico not more than 225 miles from the continental United States)	Ad valorem tax.	7.5% of ticket price.
b. Domestic Passenger Flight Segment	A domestic segment is a flight leg consisting of one takeoff and one landing by a flight.	Rate is indexed by the Consumer Price Index starting January 1, 2002.
c. Passenger Ticket Tax at Rural Airports (having less than 100,000 boardings and more than 75 miles from an airport with 100,000 boardings)	Assessed on tickets on flights that begin/end at a rural airport. Rural airports are airports having less than 100,000 enplanements during second preceding calendar year, and either 1) not located within 75 miles of another airport with 100,000 enplanements, 2) is receiving essential air service subsides, or 3) is not connected by paved roads to another airport.	7.5% of ticket price (same as passenger ticket tax). Flight segment fee does not apply.
d. International Departure and Arrival Taxes	Head tax assessed on passengers arriving or departing for foreign destinations (and U.S. territories) that are not subject to the passenger ticket tax.	Rate is indexed by the Consumer Price Index starting January 1, 1999.

Table V-1 Revenue Sources for the Airport and Airway Trust Fund

Aviation Taxes	Comment	Tax Rate
e. Flights between the Continental United States and Alaska or Hawaii		Rate is indexed by the Consumer Price Index starting January 1, 1999.
f. Frequent Flyer Tax	Ad valorem tax assessed on mileage awards (for example, credit cards).	7.5% of value of miles.
g. Domestic Freight and Mail		6.25% of amount paid for the transportation of property by air.
h. General Aviation Fuel Tax		Aviation gasoline – 19.3¢ per gallon. Jet fuel – 21.8¢ per gallon. Effective after March 31, 2012, a 14.1¢ per gallon surcharge on fuel for aircraft used in a fractional ownership program.
i. Commercial Fuel Tax		4.3¢ per gallon.

Appendix W. Competition Plans

W-1. Legislative History.

AIR-21 (Wendell H. Ford Aviation Investment and Reform Act for the 21st Century, Public Law 106-181), Section 155, required the submission of a Competition Plan by certain large and medium hub airports (covered airports) for an AIP grant to be issued beginning in fiscal year 2001. Competition Plan requirements are found in 49 USC § 47106(f).

W-2. Purpose.

Per FAA policy, major airports must be available on a reasonable basis to all carriers wishing to serve the airport. The underlying purpose of the competition plan is for the airport to demonstrate how it will provide for new entrant access and expansion by incumbent carriers.

W-3. Covered Airports.

Per 49 USC § 47106(f)(4) Completion Plans are required for covered airports that meet the conditions outlined in Table W-1.

Table W-1 Airports Falling Under the Competition Plan Requirements

If the following two conditions exist at an airport, the airport is considered a covered airport…
a. The airport is a medium or large hub airport.
b. One or two air carriers control more than 50% of the passenger boardings.

W-4. Prohibition on Grant Execution.

49 USC § 47106(f) prohibits the FAA from issuing an AIP grant to a covered airport unless the airport has submitted a written Competition Plan. It is FAA policy that AIP grants cannot be issued unless a required Competition Plan or Competition Plan update has been *approved* by the FAA. In rare circumstances, when there is a specific and urgent justification, APP-1 may approve a request for the FAA to award a grant based on a conditional approval, but only if the grant includes a special condition that prohibits drawdown of the grant funds until the conditions of the competition plan approval have been fulfilled to the FAA's satisfaction.

W-5. Requirements for Initial Plan Submittal and Updates.

Per FAA policy, covered airports must submit Competition Plans and updates as required in Table W-2. The FAA encourages covered airport to file their initial Competition Plan as close as possible to the start of the fiscal year. Covered airports must either provide two copies of their Competition Plan or Competition Plan update to APP-1 or file an electronic version as directed by the APP-510. In addition, covered airports must also submit one copy of their Competition Plan or update to the ADO and regional office.

Table W-2 Completion Plan and Update Requirements

For the following situation…	The sponsor must…
a. The sponsor is a covered airport and has not submitted an initial Competition Plan.	Submit an initial plan to the FAA. The FAA will send written notification letters to airports that will be required to file initial Competition Plans as close to the beginning of the fiscal year as possible. The FAA encourages covered airports to file their initial Competition Plan as close as possible to the start of the fiscal year to avoid undue delay in AIP grants.
b. The FAA has approved an initial plan, and the sponsor is on the first or second update.	Submit the update within 18 months of the latest FAA approval letter. The FAA will send written notification letters to airports that will be required to file Competition Plan updates as close to the beginning of the fiscal year as possible. The FAA encourages covered airports to file each update as close as possible to the start of the fiscal year to avoid undue delay in AIP grants.

Table W-2 Completion Plan and Update Requirements

For the following situation…	The sponsor must…
c. The FAA has approved an initial plan and two updates.	Submit an update if either of the following special conditions arise. Per FAA policy, covered airports must file these updates within 60 days of these conditions arising to avoid undue delays in AIP grants. **(1) Denial of Access.** An airport files a competitive access report as required by 49 USC § 47107(s) stating it had denied access to an air carrier for gates or facilities within the last six months. 49 USC § 47107(s) requires any medium or large airport that has denied a carrier's request or requests for access to file a report with the Secretary of Transportation describing the carrier's requests, providing an explanation as to why the requests could not be accommodated, and providing a time frame within which, if any, the airport will be able to accommodate the requests. Reports are due each February and August. The FAA expects the airport's written Competition Plan to discuss any changes since the previous submittal as well as and any issues that were raised in the FAA's approval letter. **(2) New Lease and Use Agreement.** An airport executes a new master lease and use agreement, or significantly amends a lease and use agreement, including an amendment due to use of Passenger Facility Charge financing for gates. The FAA encourages airports to consult with the FAA about new lease provisions and to provide the FAA the opportunity to review the new or amended provisions prior to formal execution.

W-6. Initial Competition Plan Contents.

Per 49 USC § 47106(f), initial Competition Plans must include the information in Table W-3 in order for the FAA to accept a filing.

Table W-3 Required Initial Competition Plan Content

Per 49 USC § 47106(f), Competition Plans must include…	Per FAA policy, the following information must be provided to meet the requirements in 49 USC § 47106(f):
a. The availability of airport gates and related facilities.	**(1)** Number of gates available at the airport by lease arrangement, i.e., exclusive, preferential, or common-use, and current allocation of gates. **(2)** Whether any air carriers that have been serving the airport for more than three years are relying exclusively on common-use gates.

Table W-3 Required Initial Competition Plan Content

Per 49 USC § 47106(f), Competition Plans must include…	Per FAA policy, the following information must be provided to meet the requirements in 49 USC § 47106(f):
	(3) Diagram of the airport's concourses. **(4)** Description of gate use monitoring policies, including any differences in policy at gates subject to Passenger Facility Charge Program Assurance # 7 (Competitive Access) and samples of gate use monitoring charts, along with a description of how the charts are derived and how they are used by the airport. The current version of the assurances can be obtained from the FAA Office of Airports website (see Appendix B for link). **(5)** Description of the process for accommodating new service and for service by a new entrant. **(6)** Description of any instances in which the Passenger Facility Charge Program Assurance #7 (Competitive Access) operated to convert previously exclusive-use gates to preferential-use gates or it caused such gates to become available to other users. The current version of the assurances can be obtained from the FAA Office of Airports website (see Appendix B for link). **(7)** Gate utilization (departures/gate) per week and month reported for each gate. **(8)** The circumstances of accommodating a new entrant or expansion during the 12 months preceding filing, including the length of time between initial carrier contact of airport and start of service, the identity of the carriers and how they were accommodated. **(9)** Resolution of any access complaints by a new entrant or an air carrier seeking to expand service during the 12 months preceding the filing, including a description of the process used to resolve the complaint. **(10)** Use/lose, or use/share policies and recapture policies for gates and other facilities. If no such policies exist, an explanation the role, if any under-utilized gates play in accommodating carrier requests for gates must be provided. **(11)** Plans to make gates and related facilities available to new entrants or to air carriers that want to expand service at the airport and methods of accommodating new gate demand by air carriers at the airport (common-use, preferential-use, or exclusive-use gates). **(12)** Availability of an airport competitive access liaison to assist requesting carriers, including new entrants. **(13)** Number of aircraft remain overnight (RON) positions available at the airport by lease arrangement, i.e., exclusive, preferential, common-use or unassigned, and distribution by carrier. This must include a description of the procedures for monitoring and

Table W-3 Required Initial Competition Plan Content

Per 49 USC § 47106(f), Competition Plans must include…	Per FAA policy, the following information must be provided to meet the requirements in 49 USC § 47106(f):
	assigning RON positions and for communicating availability of RON positions to users.
b. Leasing and subleasing arrangements.	**(1)** Whether a subleasing or handling arrangement with an incumbent carrier is necessary to obtain access. **(2)** How the airport assists requesting airlines to obtain a sublease or handling arrangement. **(3)** Airport polices for sublease fees levels (e.g., maximum 15% above lease rates), and for oversight of fees, ground/handling arrangements and incumbent schedule adjustments that could affect access to subtenants. **(4)** Process by which availability of facilities for sublease or sharing is communicated to other interested carriers and procedures by which sublease or sharing arrangements are processed. **(5)** Procedures for resolving disputes or complaints among carriers regarding use of airport facilities, including complaints by subtenants about excessive sublease fees or unnecessary bundling of services. **(6)** Resolution of any disputes over subleasing arrangements in the 12 months preceding filing. **(7)** Accommodation of independent ground service support contractors, including ground handling, maintenance, fueling, catering or other support services. **(8)** Copies of lease and use agreements in effect at the airport.
c. Gate use requirement.	**(1)** Gate use monitoring policy, including schedules for monitoring, basis for monitoring activity (i.e., airline schedules, flight information display systems, etc.), and the process for distributing the product to interested carriers. **(2)** Requirements for signatory status and identity of signatory carriers. **(3)** Where applicable, minimum use requirements for leases (i.e., frequency of operations, number of seats, etc.). **(4)** The priorities, if any, employed to determine carriers that will be accommodated through forced sharing or sub-leasing arrangements. This must include a description of how these priorities are communicated to interested carriers. **(5)** Justifications for any differences in gate use requirements among tenants. **(6)** Usage policies for common-use gates, including, where applicable, a description of priorities for use of common-use

Table W-3 Required Initial Competition Plan Content

Per 49 USC § 47106(f), Competition Plans must include…	Per FAA policy, the following information must be provided to meet the requirements in 49 USC § 47106(f):
	gates. This must include an explanation of how these priorities are communicated to interested carriers. **(7)** Methods for calculating rental rates or fees for leased and common-use space. This must include an explanation of the basis for disparities in rental fees for common-use versus leased gates.
d. Gate-assignment policy.	**(1)** Gate assignment policy and method of informing existing carriers and new entrants of this policy. This must include standards and guidelines for gate usage and leasing, such as security deposits, minimum usage, if any, fees, terms, master agreements, signatory and non-signatory requirements. **(2)** Methods for announcing to tenant carriers when gates become available. The description must discuss whether all tenant air carriers receive information on gate availability and terms and conditions by the same process at the same time. **(3)** Methods for announcing to non-tenant carriers, including both those operating at the airport and those that have expressed an interest in initiating service, when gates become available, and policies on assigning remain overnight (RON) positions and how RON position availability announcements are made.
e. Financial constraints.	**(1)** The major source of revenue at the airport for terminal projects. **(2)** Rates and charges methodology (residual, compensatory, or hybrid). **(3)** Past use, if any, of Passenger Facility Charges for gates and related terminal projects. **(4)** Availability of discretionary income for airport capital improvement projects.
f. Airport controls over air and ground-side capacity.	**(1)** Majority-in-interest (MII) or no further rates and charges clauses covering groundside and airside projects. **(2)** Any capital construction projects that have been delayed or prevented because an MII was invoked. **(3)** Plans, if any, to modify existing MII agreements.
g. Whether the airport intends to build or acquire gates that would be used as common facilities.	**(1)** The number of common-use gates that the airport intends to build or acquire and the timeline for completing the process of acquisition or construction. This must include a description of the intended financing arrangements for these common-use gates, and whether the gates will be constructed in conjunction with preferential or exclusive-use gates.

Table W-3 Required Initial Competition Plan Content

Per 49 USC § 47106(f), Competition Plans must include…	Per FAA policy, the following information must be provided to meet the requirements in 49 USC § 47106(f):
	(2) Whether common-use gates will be constructed in conjunction with gates leased through exclusive or preferential-use arrangements. **(3)** Whether gates being used for international service are available for domestic service. **(4)** Whether air carriers that only serve domestic markets now operate from international gates. This must include a description and explanation of any disparity in their terminal rentals versus domestic terminal rentals.
h. Per 49 USC § 47107(a)(15), the method for making the Competition Plan available to the public.	**(1)** 49 USC § 47107(a)(15) requires sponsors to make special airport financial reports available to the public. Therefore, the Competition Plan must include the covered airport's method of satisfying this requirement. If web posting is employed, the filing must identify the precise web address where the Competition Plan material may be found. Per FAA policy, if a web posting is not employed, the reasons for this decision must be discussed in the submission.

W-7. Competition Plan Update Contents.

Per FAA Policy, Competition Plan updates must include the information in Table W-4.

Table W-4 Required Competition Plan Update Content

Per FAA Policy, Competition Plan updates must include also include…
a. Changes from Last FAA Approval. Information regarding new relevant changes in competitive circumstances at the airport since the previous FAA approval. If there have been no changes in competitive filing information, the airport must state that there has been no change since the previous plan approval. For new master lease agreements or significantly amended lease agreements, this includes a copy of the agreement, a written description of the changes in lease terms, and leasing practices or policies included in the lease document.
b. Reasons for Not Instituting FAA Recommendations. In instances in which the FAA has recommended that an airport adopt a particular management or operating practice and the airport has declined the recommendation, per FAA policy, the airport must explain the activities and/or procedures it is performing that would achieve the same result as the FAA's recommended practice.
c. Responses to FAA Questions. Responses to questions raised or recommendations included in previous FAA approvals.

Table W-4 Required Competition Plan Update Content

Per FAA Policy, Competition Plan updates must include also include…
d. Public Availability. 49 USC § 47107(a)(15) requires sponsors to make special airport financial reports available to the public. Therefore, the Competition Plan update must include the covered airport's method of satisfying this requirement. If web posting is employed, the filing must identify the precise web address where the Competition Plan update material may be found. If a web posting is not employed, the reasons for this decision must be discussed in the submission.

W-8. Sponsor Guidance.

Additional guidance that sponsors can use to reduce barriers to entry and enhance competitive access is contained in the current version of the document titled Highlights of Reported Actions to Reduce Barriers to Entry and Enhance Competitive Access. Additional useful information is contained in the U.S Department of Transportation report titled Airport Business Practices and Their Impact on Airline Competition. See Appendix B for references and links to these documents.

W-9. Plan Review Process.

Per FAA policy, a joint DOT Office of the Secretary (OST) and FAA team will review each plan to determine that the Competition Plan or Competition Plan update satisfies statutory requirements. APP-1 will advise the covered airport and the applicable regional office and ADO of all acceptances, identified deficiencies, or rejections in writing. The OST/FAA team has the option to contact the airport informally during the course of the Competition Plan review. This contact will generally take the form of a telephone conference call and may include a site visit.

W-10. Additional FAA Actions.

Per FAA policy, the FAA has the option to periodically review the implementation of competition plans of all covered airports and may conduct site visits to meet our obligation to ensure that each covered airport successfully implements its approved plan.

W-11. Plan Development Eligibility.

Per FAA Policy, competition plans and updates are only eligible for AIP funding as part of an eligible master planning project (not as a stand-alone project). Additionally, the scope of work for full master planning studies and updates for the full study must include a Competition Plan development or update as part of the effort (if the studies or updates include a review of terminal development and the airport is a covered airport). However, this requirement would not apply to master planning efforts that are either minor in scope or that are occurring at times that would create a duplication of effort with recently completed plans or updates.

Appendix X. Buy American Guidance

X-1. General Sponsor Buy American Requirements.

The Buy American Preferences under 49 USC § 50101 require that all steel and manufactured goods used in AIP funded projects be produced in the United States. Under 49 USC § 50101(c), ground transportation demonstration projects in 49 USC § 47127 are excluded. Sponsors must complete one of the three requirements in Table X-1 for the AIP projects (including ineligible or non-AIP funded work included in the same contract).

Table X-1 General Sponsor Buy American Requirements

All sponsors must complete one of the following for AIP funded projects…
(1) Certify, in writing, all products are wholly produced in America and are of 100% U.S. materials.
(2) Certify that all equipment that is being used on the project is on the Nationwide Buy American conformance list.
(3) Request a waiver to use non- U.S. produced products.

X-2. Other Buy American and Buy America Requirements.

There are other Buy American and Buy America preference rules and requirements imposed by other Federal agencies that may differ from the AIP Buy American guidance. That is because there are difference statutory requirements for other Federal agencies and grant programs that do not apply to AIP.

X-3. Changes Orders and Buy American Requirements.

A change order to a project requires a separate Buy American review and may require an ADO determination.

X-4. Buy American Waiver Process and Delegation.

Under 49 USC § 50101(b) and 49 CFR § 1.83(a)(11), the FAA is given the authority to waive these Buy American Preferences if certain market or product conditions exist. Many pieces of equipment are constructed with some non- U.S. produced components or subcomponents. Therefore, it is expected that the sponsor will have to request a waiver on a majority of projects (unless the project is constructed of materials that already have a nationwide waiver). These requirements only apply to manufactured components and subcomponents. Software is not considered a component or subcomponent.

The four types of Buy American waivers that the FAA may be issued are listed in Table X-2. The responsibility for Type I and II waivers, as well as any nationwide waivers remains with

APP-500. The ADOs have been delegated the authority to issue Type III and Type IV waivers to a sponsor on a project level.

Table X-2 Criteria by Buy American Waiver Type

For the following…	The following criteria apply…
Type I Waiver	Per 49 USC § 50101(b)(1), the FAA can issue this type of waiver if the FAA determines that applying the Buy American requirements would be inconsistent with the public interest. Due to the possible national implications of such a waiver, APP-500 is responsible for reviewing and issuing Type I Waivers.
Type II Waiver	Per 49 USC § 50101(b)(2), the FAA can issue this type of waiver for equipment or construction material if the FAA determines that the goods are not produced in a sufficient and reasonably available amount or are not of a satisfactory quality. Type II Waivers can only be issued on the equipment/construction material level and cannot be issued for a system and/or facility that is comprised of various pieces of equipment/construction material. These waivers are issued by APP-500, after the FAA publishes a Federal Register Notice asking manufacturers to advise the FAA if they manufacture the equipment/material that is seeking a waiver and if their product meets the FAA specifications and Buy American requirements. After manufacturers respond to this notice, APP-500 will make a determination if there is insufficient quantity or quality.

Table X-2 Criteria by Buy American Waiver Type

For the following…	The following criteria apply…
Type III Waiver	Per 49 USC § 50101(b)(3), the FAA can issue this type of waiver if the FAA determines that 60% or more of the components and subcomponents in the equipment/facility are of U.S. origin and their final assembly is in the United States. A Type III Waiver cannot be issued at the system level and must be issued for each piece of equipment; however, in the case of facilities a Type III Waiver may be issued for the entire facility if all the construction materials when combined meet the 60% U.S. origin requirement. The ADO may issue these waivers. For block grant state projects, only the FAA (usually the ADO) may issue the waivers. Block grant states are not allowed to issue a waiver. To complete a Type III Waiver request, the following supporting documentation must be submitted by the requester: **(1)** A completed Buy American Content Percentage Calculation Worksheet (or equivalent) (see Appendix B for link). Per 49 USC § 50101(c), labor costs at final assembly must be excluded from this worksheet. This is because the Buy American statute is based on the cost of materials and equipment, not labor. **(2)** A completed Buy American Product Final Assembly Questionnaire (or equivalent) (see Appendix B for link). Final assembly in the United States must meet the standard defined below under Final Assembly Location. **(3)** The manufacturer must certify in writing that any major structural steel used in their equipment is of 100% U.S. origin. Small amounts of steel that are used in components and subcomponents, that are not structural steel, may be of foreign origin. This would typically consist of nuts, bolts and clips. For these types of steel, the manufacturer must indicate the use of the steel (nuts, bolts, clips, etc.) and must count this steel as non-U.S. origin when completing the Content Percentage Calculation Form. Per FAA policy, after the ADO reviews the waiver request, the ADO must send a notification to the requester informing them of the approval or disapproval of the waiver. The ADO must use the following language in this notification for project specific waivers: *I have reviewed the request for Waiver of Buy American Requirement submitted by XXX for the use of XXXXX equipment on the subject project. The information submitted by XXXX satisfies the requirement for waiver of the requirements of 49 USC § 50101 based on XX% of the cost of components and subcomponents to be used in the project being produced in the United States with final assembly being performed in XXXXXXX. The waiver is hereby approved for use on this AIP grant project*. The ADO must place a copy of the notifications in the grant file. Following this notification, no further action is required.

Table X-2 Criteria by Buy American Waiver Type

For the following…	The following criteria apply…
Type IV Waiver	Per 49 USC § 50101(b)(4), the FAA can issue this type of waiver if the FAA determines that applying Buy American requirements increases the cost of the overall project by more than 25%. The ADO may issue these waivers. For block grant state projects, only the FAA (usually the ADO) may issue the waivers. Block grant states are not allowed to issue a waiver. In order to issue this type of waiver, the FAA must determine that there is at least one bid from a Buy American compliant supplier to make the 25% cost increase determination. Per FAA policy, after the ADO reviews the waiver request, the ADO must send a notification to the requester informing them of the approval or disapproval of the waiver. The ADO must use the following language in this notification for project specific waivers: *I have reviewed the request for Waiver of Buy American Requirement submitted by XXX for the use of XXXXX equipment on the subject project. The information submitted by XXXX satisfies the requirement for waiver of the requirements of 49 USC § 50101 that including domestic material will increase the cost of the overall project by more than 25%. The waiver is hereby approved for use on this AIP grant project*. The ADO must place a copy of the notifications in the grant file. Following this notification no further action is required.

X-5. National Buy American Waiver.

APP-500 may issue National Waivers for certain equipment/material that is used frequently in AIP funded projects. APP-500 will list these National Waivers on the FAA Office of Airports website under the Buy American Conformance List. Any equipment or materials on the Buy American Conformance List do not need additional waiver materials. All personnel not in APP-500 must direct any manufacturer seeking to be added to this Buy American Conformance List to APP-500.

X-6. Definitions.

To assist in making Buy American Waiver determinations the following definitions apply:

Table X-3 Buy American Specific Definitions

Buy American Waiver specific definitions include…
a. Project. The *Project* is generally the project that is being bid or procured. The *Project* does not extend over multiple grants or phases, even though the overall project may be phased or may be built in multiple bid packages.

Table X-3 Buy American Specific Definitions

Buy American Waiver specific definitions include…
b. Facility or Equipment. This will be defined differently depending on the project. For a building, the portion of the building that is being funded under the AIP grant is the *facility* listed in the waiver. For other projects, the bid items as described in the current version of Advisory Circular 150/5370-10, Standards for Specifying Construction of Airports, will generally be the *equipment* referred to in the waiver except for airfield electrical equipment. For airfield electrical equipment, the L- items listed in the Addendum to the current version of Advisory Circular 150/5345-53, Airport Lighting Equipment Certification Program, will generally be the *equipment* referred to in the waiver. For a vehicle or single piece of equipment like a snow plow or ARFF vehicle, the single vehicle itself is the *equipment*.
c. Final Assembly Location. Final assembly is a process whereby assembly is meaningful and complex utilizing a substantial amount of time and resources, a number of different assembly operations, and a high level of skilled labor. The Final Assembly Questionnaire must be completed in order to determine whether final assembly occurs at the recorded site.
d. Nonavailable Items. By FAA policy, the list of items that have been determined nonavailable per 48 CFR § 25.104 are excluded from the Buy American preference requirements for AIP funded projects. This list includes petroleum products; therefore, asphalt is a nonavailable item per this list. In addition, the FAA has determined that cement and concrete are also nonavailable items excluded from the Buy American preference requirements (although the steel used for reinforcement, ties, stirrups, etc. must meet Buy American).

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Appendix Y. Federal Share at Public Land State Airports

Y-1. General Federal Share Definition.

The United States Government's share of project costs on an AIP grant (also known as Federal share or Federal match) is defined in 49 USC § 47109. The Federal share varies by airport size and is generally 75% for large and medium hub airports and 90% for all other airports. The share applicable to a generic class of airports is called the *general Federal share*.

Y-2. Public Land States Definition.

Since the early days of Federal participation in airport infrastructure projects, Congress has provided a higher Federal share at airports located in states with more than 5% of their geographic acreage comprised of unappropriated and unreserved public lands and nontaxable Indian lands (individual and tribal). Land fitting this definition is called Federal land and states meeting the statutory criteria are called public land states.

There are currently 13 public land states whose Federal lands account for between 6.6% (Washington) and 69.23% (Nevada) of the states' total acreage. The Federal land percentages in each of the public land states are identified in Table Y-1. The FAA obtained these percentages from Federal Highway Administration (FHWA) data published pursuant to 23 USC § 120(b)(1), effective March 17, 1992, per 58 Federal Register 158 (January 4, 1993).

Table Y-1 Federally-Controlled Acreage in Public Land States

For the following state…	The percentage of unappropriated and unreserved public lands and nontaxable Indian lands (individual and tribal) in the State is…
(1) Alaska	34.03%
(2) Arizona	43.37%
(3) California	15.74%
(4) Colorado	12.06%
(5) Idaho	22.69%
(6) Montana	12.42%
(7) Nevada	69.23%
(8) New Mexico	26.44%
(9) Oregon	22.23%
(10) South Dakota	9.72%

Table Y-1 Federally-Controlled Acreage in Public Land States

For the following state…	The percentage of unappropriated and unreserved public lands and nontaxable Indian lands (individual and tribal) in the State is…
(11) Utah	41.83%
(12) Washington	6.6%
(13) Wyoming	27.58%

Y-3. History of the Public Land Share Formula.

Since 1970, airport projects in these public land states have been eligible for increased Federal contributions calculated using a series of complex, legislatively-defined formulas. These grant Federal share formulas for public land states have changed over time to keep pace with legislative changes in general Federal shares. The Federal participation rates at airports in public land states are calculated using the prevailing general Federal share for each classification of airports in 49 USC § 47109.

Between 1970 and 1980, Congress adjusted the general Federal shares significantly through a series of amendments to the Airport and Airway Development Act of 1970. ADAP was the predecessor grant program to AIP. The laws that changed the Federal share during ADAP were Public Law 91-258 (May 21, 1970), Public Law 93-44 (June 18, 1973), Public Law 94-353 (July 12, 1976), Public Law 96-415 (November 15, 1979), Public Law 93-44 (July 18, 1973), and Public Law 94-353 (July 12, 1976). As the general Federal shares for grants have increased, Congress changed the public land state formulas to ensure that smaller airports in public land states received some consideration for the large inventories of Federal lands. The legislative formulas under 49 USC § 47109 part ‘b’ and ‘c’ reference the general Federal shares on two specific dates: June 30, 1975 and August 3, 1979. Table Y-2 illustrates the changes in the general Federal share from 1970 to 1980, highlighting the general Federal shares on the two dates of interest.

AIP was established in 1982. The general Federal share under AIP for large and medium hub primary airport grants stabilized at 75%, and the general Federal share for other airport grants increased and then stabilized at 90%. The laws that changed the Federal share during this period were Public Law 97-248, Section 513(b)(5); (September 3, 1982); Public Law 100-223, Section 111(a)(2) (December 30, 1987); and Public Law 102-581, Section 110(b) (October 31, 1992).

In 2003, Congress passed the FAA Century of Aviation Reauthorization Act (Vision 100), Public Law 108-176, Section 161 (December 12, 2003), which temporarily increased the general Federal share of grants at small hub primary, nonhub primary, nonprimary commercial service airports, nonprimary general aviation, and reliever airports to 95%. This increase to 95% was greater than the maximum Federal share (93.75%) that could be calculated under the public land state formulas. Therefore, there was no reason to calculate the public land state Federal grant

share while Vision 100 was in effect, since the 95% general Federal share would always be greater than the maximum public land state percentage. Therefore, between 2003 and 2011, the public land state airports – along with other small airports in the United States – generally received a Federal share of 95% for AIP grants.

In 2012, Congress passed the FAA Modernization and Reform Act of 2012 (FMRA), Public Law 112-95 (February 14, 2012), which did not retain the increased general Federal share provision of Vision 100. Most airports that had been receiving the higher Vision 100 share of 95% reverted to the prior general Federal share of 90%. Smaller airports in public land states reverted to the shares calculated under the public land state formulas, which allowed a Federal share of up to 93.75%.

Table Y-2 Federal Shares by Airport Classification in Public-Land States Between 1970 and 1980

Year	Large Hub Airports	Medium Hub Airports	Small Hub Primary, Nonhub Primary and Nonprimary Commercial Service Airports*	Non-primary General Aviation and Reliever Airports*
a. 1970 – 1973	50%	50%	50%	50%
b. 1974 – 1975 (part 'b' reference)	50%	75%	75%	75%
c. 1976 – 1978	75%	75%	90%	90%
d. 1979 (part 'c' reference) – 1980	75%	75%	80%	80%

Y-4. Calculating the Federal Share in Public Land States Using the Part 'b' and Part 'c' Formulas.

49 USC § 47109 includes two sets of instructions for calculating the Federal share at airports in public land states. Part 'b' provides the general formula for all airports in public land states. Part 'c' provides an additional formula that only applies to small hub primary, nonhub primary and nonprimary commercial service airports.

Y-5. Part 'b' Formula.

The Part 'b' formula applies to airports of all sizes and involves a multi-part analysis. The calculation involves a yes/no test to determine whether a specific class of airports in a public land state is eligible for an adjusted Federal share calculation. If yes, a three-part formula is used to calculate the appropriate share as shown in Table Y-3.

The numerical values and results of the Part 'b' calculation for all airport classes in public land states are contained in Table Y-4. In each row, the highlighted cell identifies the Federal share percentage that governs in that instance, based on the statutory formulas. Note that the Federal shares for small hub primary, nonhub primary and nonprimary commercial service airports in Table Y-4 may change as a result of the part 'c' calculation discussed in the *Grandfather Rule* section to follow.

Table Y-3 Yes/No Test for Part 'b' Calculation

Is the Current General Federal Share (Column C of Table Y-4) less than the 1975 Share (Column B of Table Y-4)?	**Then the Federal Share is…**
a. No	The Current Share (Column C of Table Y-4)
b. Yes	The lessor of: **(1)** The Current Share Increased by 25% (Column E of Table Y-4) **(2)** The Current Share + 1/2 the Public Land Percent (Column F of Table Y-4) **(3)** The 1975 Share (Column G of Table Y-4)

Table Y-4 Part 'b' Calculation Results (see Table Y-5 for columns marked *)

State/ Airport Type*	**A*** % Public Land	**B*** Federal Share, % in 1975	**C** Current Federal Share (FMRA)	**D (y/n)** Is Current Share < 1975?	**E* (calc 1)** Current Share Increased by 25%	**F (calc 2)** Current Share Increased by 1/2 Public Land %	**G (calc 3)** Increased to = 1975 Fed Share	**H** Part 'b' Results
Alaska	**34.03**							
LH		62.5	75	no				75.00
MH		93.75	75	yes	93.75	87.76	93.75	87.76
SH, NHP, & NPCS		93.75	90	yes	112.5	105.31	93.75	93.75
GA & RL		93.75	90	yes	112.5	105.31	93.75	93.75
Arizona	**43.37**							
LH		60.65	75	no				75

Table Y-4 Part 'b' Calculation Results (see Table Y-5 for columns marked *)

State/ Airport Type*	**A*** % Public Land	**B*** Federal Share, % in 1975	**C** Current Federal Share (FMRA)	**D (y/n)** Is Current Share < 1975?	**E* (calc 1)** Current Share Increased by 25%	**F (calc 2)** Current Share Increased by 1/2 Public Land %	**G (calc 3)** Increased to = 1975 Fed Share	**H** Part 'b' Results
MH		91.06	75	yes	93.75	91.26	91.06	91.06
SH, NHP, & NPCS		91.06	90	yes	112.5	109.52	91.06	91.06
GA & RL		91.06	90	yes	112.5	109.52	91.06	91.06
California	**15.74**							
LH		53.72	75	no				75
MH		80.59	75	yes	93.75	80.90	80.59	80.59
SH, NHP, & NPCS		80.59	90	no				90
GA & RL		80.59	90	no				90
Colorado	**12.06**							
LH		52.68	75	no				75
MH		79.02	75	yes	93.75	79.52	79.02	79.02
SH, NHP, & NPCS		79.02	90	no				90
GA & RL		79.02	90	no				90
Idaho	**22.69**							
LH		55.78	75	no				75
MH		83.64	75	yes	93.75	83.51	83.64	83.51
SH, NHP, & NPCS		83.64	90	no				90
GA & RL		83.64	90	no				90

Table Y-4 Part 'b' Calculation Results (see Table Y-5 for columns marked *)

State/ Airport Type*	**A*** % Public Land	**B*** Federal Share, % in 1975	**C** Current Federal Share (FMRA)	**D (y/n)** Is Current Share < 1975?	**E* (calc 1)** Current Share Increased by 25%	**F (calc 2)** Current Share Increased by 1/2 Public Land %	**G (calc 3)** Increased to = 1975 Fed Share	**H** Part 'b' Results
Montana	**12.42**							
LH		52.98	75	no				75
MH		79.47	75	yes	93.75	79.66	79.47	79.47
SH, NHP, & NPCS		79.47	90	no				90
GA & RL		79.47	90	no				90
Nevada	**69.23**							
LH		62.5	75	no				75
MH		93.75	75	yes	93.75	100.96	93.75	93.75
SH, NHP, & NPCS		93.75	90	yes	112.5	121.15	93.75	93.75
GA & RL		93.75	90	yes	112.5	121.15	93.75	93.75
New Mexico	**26.44**							
LH		56.16	75	no				75
MH		84.29	75	yes	93.75	84.92	84.29	84.29
SH, NHP, & NPCS		84.29	90	no				90
GA & RL		84.29	90	no				90
Oregon	**22.23**							
LH		55.66	75	no				75
MH		83.33	75	yes	93.75	83.34	83.33	83.33

Table Y-4 Part 'b' Calculation Results (see Table Y-5 for columns marked *)

State/ Airport Type*	A* % Public Land	B* Federal Share, % in 1975	C Current Federal Share (FMRA)	D (y/n) Is Current Share < 1975?	E* (calc 1) Current Share Increased by 25%	F (calc 2) Current Share Increased by 1/2 Public Land %	G (calc 3) Increased to = 1975 Fed Share	H Part 'b' Results
SH, NHP, & NPCS		83.33	90	no				90
GA & RL		83.33	90	no				90
South Dakota	**9.72**							
LH		52.57	75	no				75
MH		78.55	75	yes	93.75	78.65	78.55	78.55
SH, NHP, & NPCS		78.55	90	no				90
GA & RL		78.55	90	no				90
Utah	**41.83**							
LH		60.65	75	no				75
MH		90.63	75	yes	93.75	90.69	90.63	90.63
SH, NHP, & NPCS		90.63	90	yes	112.5	108.82	90.63	90.63
GA & RL		90.63	90	yes	112.5	108.82	90.63	90.63
Washington	**6.6**							
LH		51.52	75	no				75
MH		77.31	75	yes	93.75	77.48	77.31	77.31
SH, NHP, & NPCS		77.31	90	no				90
GA & RL		77.31	90	no				90

Table Y-4 Part 'b' Calculation Results (see Table Y-5 for columns marked *)

State/ Airport Type*	A* % Public Land	B* Federal Share, % in 1975	C Current Federal Share (FMRA)	D (y/n) Is Current Share < 1975?	E* (calc 1) Current Share Increased by 25%	F (calc 2) Current Share Increased by 1/2 Public Land %	G (calc 3) Increased to = 1975 Fed Share	H Part 'b' Results
Wyoming	**27.58**							
LH		56.33	75	no				75
MH		84.58	75	yes	93.75	85.34	84.58	84.58
SH, NHP, & NPCS		84.58	90	no				90
GA & RL		84.58	90	no				90

*The increased Federal share for large hub airports in 1975 was less than the current Federal share of 75%, therefore there is no increase in Federal share for a large hub airport in a public land states.

Table Y-5 Column Notes for Table Y-4

For Column…	The following applies…
(1) State/Airport Type	LH = Large Hub MH = Medium Hub SH = Small Hub NHP = Non Hub Primary NPCS = Nonprimary Commercial Service GA = General Aviation RL = Reliever
(2) A - % Public Land	The actual percentage of public land in a state was last calculated in 1992 by the Department of Interior (DOI). According to DOI, the agency stopped calculating this statistic because the source data comes from five separate Federal agencies, none of which collect and report data consistently. Because the AIP statute directs FAA to use these statistics, and 1992 was the last year these statistics were produced, FAA continues to rely on the 1992 DOI public land inventories (published in 58 Federal Register 158 (January 4, 1993) by the Federal Highway Administration) to calculate current Federal share.

Table Y-5 Column Notes for Table Y-4

For Column…	The following applies…
(3) B - Federal Share % in 1975	The adjusted Federal shares for large hub airports were published in 37 Federal Register 11014 (June 1, 1972). In 1974, Congress increased the general Federal share to 75% for all airports enplaning less than 1% of passengers in 1974. The Airport Development Acceleration Act, enacted on June 18, 1973, amended the Airport and Airway Development Act of 1970 (Public Law 91-258). The Act became effective for grants issued during Federal Fiscal Year 1974, which began July 1, 1973. While this change affected airports categorized as medium hubs and smaller, the FAA did not publish adjusted rates for the smaller airports until 1979. While the Part 'b' calculation requires a comparison to the rates in place for these smaller airports in 1975, the FAA is using the 1979 published shares as a proxy for the 1975 rates for smaller airports. These rates have been used by the FAA for at least 10 years to perform the Part 'b' calculations.
(4) E (calc 1) - Current share Increased by 25%	The statutory formula to increase the current Federal share by 1/2 the public land percentage is calculated by multiplicatively, not additively. To be consistent with the Column D directive to increase current Federal share by 25%, Column E is calculated by increasing the current Federal share by the percentage equal to 1/2 the state's public land percentage. For example, in Alaska, where the Federal land accounts for 34.03% of the state's acreage, Column E is calculated by increasing the current Federal share (75) by 17.015%. [Federal Share = 75+(0.17 *75)].

Y-6. Part 'c' Calculation (the Grandfather Rule).

In Vision 100 (passed in 2003), Congress amended 49 USC § 47109 to include a provision that applies to only small hub primary, nonhub primary and nonprimary commercial service airports in public land states. This provision, which applies in addition to the Part 'b' calculation, is codified in 49 USC § 47109(c) and is called the Part 'c' formula or *Grandfather Rule*.

Table Y-6 identifies the calculated Federal shares for small hub primary, nonhub primary and nonprimary commercial service airports in public land states. The Part 'c' formula calculates the ratio of the 1979 general Federal share for small hub primary, nonhub primary and nonprimary commercial service airports (80%) to the 1979 public land state adjusted share (Col. A) and applies that ratio to the current Federal share. The resulting adjusted Federal share (Col. B) cannot exceed the maximum percentage calculated for small hub primary, nonhub primary and nonprimary commercial service airports under Part 'b' (Col. C) or 93.75% (Col. D). The shaded table cells represent the determined or calculated share resulting from the Part 'b' or Part 'c' formulas.

Formula: 80 / A = 90 / B where B is subject to the maximum of C and D

Table Y-6 Part 'c' Calculation

State	A Adjusted Fed Share in 1979	B Adjusted Federal Share (Current	C Max Part 'b' Calculation	D Maximum of 93.75%	Part 'c' Results
a. Non Public-Land States (all those not listed below)	80.00%	90.00%	NA	NA	90.00%
b. Alaska	93.75%	105.47%	93.75%	93.75%	93.75%
c. Arizona	91.06%	102.44%	91.06%	91.06%	91.06%
d. California	80.59%	90.66%	NA	90.66%	90.66%
e. Colorado	80.00%	90.00%	NA	90.00%	90.00%
f. Idaho	83.64%	94.10%	NA	93.75%	93.75%
g. Montana	80.00%	90.00%	NA	90.00%	90.00%
h. Nevada	93.75%	105.47%	93.75%	93.75%	93.75%
i. New Mexico	84.29%	94.83%	NA	93.75%	93.75%
j. Oregon	83.54%	93.98%	NA	93.75%	93.75%
k. South Dakota	80.00%	90.00%	NA	90	90.00%
l. Utah	90.94%	102.31%	90.63%	90.63	90.63%
m. Washington	80.00%	90.00%	NA	90.00	90.00%
n. Wyoming	84.58%	95.15%	NA	93.75%	93.75%

Y-7. Public Land State Federal Share Results.

Table 4-8 contains the final Federal share calculation using the part 'b' and part 'c' calculations.

Appendix Z. Establishment and Category Upgrade Policy for Instrument Landing Systems (ILS)

Z-1. Background.

On March 24, 2015, the FAA published an updated policy on the Establishment and Category Upgrade Policy for Instrument Landing Systems. The updated policy reflects the significant progress that has been made in the availability and use of area navigation (RNAV) approach capabilities using the satellite-based Global Positioning System (GPS). Moreover, the updated policy recognizes that the FAA had already effectively moved away from installing new ILS. RNAV approaches can now provide an equivalent instrument approach capability as compared to ILS. Fleet equipage has also improved markedly such that aircraft that routinely fly under instrument flight rules (and so need an instrument approach capability) are normally equipped with the necessary avionics. Accordingly, FAA will no longer fund installation of new Category I ILS with AIP except in limited circumstances. Instead, RNAV will be the primary means of establishing new instrument approach access to qualified runway ends.

In 2017, there are approximately nine times as many RNAV/GPS approaches as compared to ILS. There are over 2300 airports, and over 3200 runway ends, that have RNAV approaches that do not have ILS. This represents a tremendous amount of reliable approach capability in the National Airspace System (NAS). Better than 92 percent of general aviation aircraft that actively fly IFR are equipped with RNAV or Wide Area Augmentation System (WAAS) avionics. In addition, the majority of air carrier aircraft have various levels of RNAV equipage installed; this continues to improve with the retirement of older aircraft with legacy non-RNAV avionics.

The existing ILS network will continue to serve non-RNAV equipped aircraft. FAA policy serves to encourage aircraft operators to equip their fleet with upgraded RNAV avionics by not adding to the existing network of ILS. The addition of new precision approach capabilities to the NAS will be accomplished with more cost-effective RNAV rather than ILS.

Z-2. Use of RNAV Approaches Instead of Cat I ILS Systems.

Development of an RNAV approach will be used instead of installation of a new Cat I ILS at all airports where technically feasible.

Z-3. FAA Air Traffic Organization (ATO) Funding for Cat I ILSs.

FAA announced in 76 Federal Register 77939 (December 15, 2011) that "In order to maximize operational benefits and take advantage of the cost savings associated with WAAS, the FAA no longer intends to establish new Category I ILSs using ATO funding." In the same notice, FAA announced consideration of "…programmatic changes under AIP that would favor WAAS for new precision approaches at airports, rather than ILS." The updated 2015 policy is consistent with these announcements and is also consistent with current practice as aligned with the 2016 FAA NAS Performance Based Navigation (PBN) Strategy.

Z-4. AIP Funding for Cat I ILSs.

At most airports, it is no longer cost effective or operationally justified to install a new Cat I ILS where an RNAV approach can provide nearly equivalent capabilities and service levels for reliable access. Therefore, instead of installing Cat I ILS for new runways or significant runway extension projects where an ILS was not presently installed, AIP funds will be the primary source of completing an RNAV survey. The sponsor can then coordinate the development of an RNAV approach with the ADO and ATO.

In the rare instances where the FAA has determined that an RNAV approach is not suitable for a given location, the sponsor can request a waiver from the ADO to use AIP funding of a traditional ILS. A possible example is a new or extended runways at a large or medium hub airports where an ILS may still be needed for merging and spacing operations for arrival sequencing. The ADO cannot use AIP funding unless APP-1 has approved the waiver.

Z-5. AIP or ATO Funding of Cat II/III ILSs.

AIP or ATO funding of Cat II/III ILS will continue for the present.

However, future enhancements to GBAS are expected to enable approaches to Cat II/III minima. When the technology is certified, FAA anticipates further policy amendments to favor non-Federal GBAS installations, rather than new ILS, to deliver Cat II/III access capabilities. Until that time, AIP funds will continue to a possible source of funding for a justified Cat II/III ILS on a new runway or major new extension.

Z-6. AIP Transition from ILS to RNAV.

a. Airport Owned ILS that has reached the end of its useful life. For any existing airport-owned ILS equipment that has reached the end of its useful life, the ADO can support a project for an RNAV survey. Alternatively, if the airport wishes to replace the equipment with other ground based ILS equipment, FAA will consider supporting the replacement of the individual components up to the reasonable cost of the RNAV survey, but the equipment replacement will not qualify for the takeover provisions found in 49 USC § 44502(e), which requires the FAA to take over ownership of the ground based equipment. Therefore, the sponsor will continue to own and maintain the ILS.

b. FAA Owned ILS. Because of budget augmentation issues, AIP funds cannot be used to upgrade or replace ground based equipment that is owned by the FAA. (There is a limited exception where the FAA-owned equipment is impacted by an AIP funded project that is unchanged by this policy.) There is no change to the eligibility of AIP funds being used for justified airfield lighting improvements (such as the installation of a threshold bar or in-pavement centerline runway lights) that are needed to support upgraded approaches.

Outlook

Fw: document

From Brandy Steffen <brandy.steffen@jla.us.com>
Date Mon 2024-10-21 11:42 AM
To Jen Winslow <Jen.winslow@jla.us.com>; Ashley Balsom <ashley.balsom@jla.us.com>

1 attachment (2 MB)
UAO airport risk analysis for ROFA mod of standards - 2024-8-29 Final.pdf;

BRANDY STEFFEN | **JLA PUBLIC INVOLVEMENT**
Partner + Senior Program Manager
brandy.steffen@jla.us.com » Schedule a 30 minute meeting

From: BEACH Anthony <Anthony.BEACH@odav.oregon.gov>
Sent: Wednesday, October 16, 2024 11:55 AM
To: Samantha Peterson <SPeterson@CenturyWest.com>; Brandy Steffen <brandy.steffen@jla.us.com>
Cc: THOMAS Alex R <Alex.R.THOMAS@odav.oregon.gov>; W. Matt Rogers <WRogers@CenturyWest.com>
Subject: FW: document

FYI, please include this email received by one of our board members in the public record.

Thank you,

Tony Beach
OREGON DEPARTMENT OF AVIATION
STATE AIRPORTS MANAGER
OFFICE 503-378-2523 **CELL** 503-302-5455
M-F 7:30am – 4pm

From: LUCAS Sarah M (Avi Board) <Sarah.M.LUCAS@odav.oregon.gov>
Sent: Wednesday, October 16, 2024 8:45 AM
To: BEACH Anthony <Anthony.BEACH@odav.oregon.gov>
Subject: Fw: document

And here's another. I never did follow up with Tony regarding Aron's report.

From: Sarah Lucas <sarahlucas1982@gmail.com>
Sent: Tuesday, October 8, 2024 8:26 AM
To: LUCAS Sarah M (Avi Board) <Sarah.M.LUCAS@odav.oregon.gov>
Subject: Fwd: document

You don't often get email from sarahlucas1982@gmail.com. Learn why this is important

This message was sent from outside the organization. Treat attachments, links and requests with caution. Be conscious of the information you share if you respond.

---------- Forwarded message ---------
From: **Helbling, Tony** <helbling@wilsonconst.com>
Date: Tue, Sep 10, 2024 at 2:13 PM
Subject: document
To: Sarah Lucas <sarahlucas1982@gmail.com>

Sarah,

This is the document we discussed a few weeks back. Aron gave me permission to send this directly. You can also get it thru ODAV as it was submitted as part of our feedback. Just thought as a professional working in the same field, it would be nice to share this analysis with directly. He'd be happy to discuss thoughts.

Aron Faegre is one of the smartest and kindest people I've ever met. He does sort of the same thing as you but is on the backside of his career/scaling back and only working for/with a few clients on a very limited basis.

Tony Helbling
Logistics Manager
Wilson Construction Company
1190 NW 3rd Ave
Canby, OR 97013
Cell: 503-519-6059
Office: 503-263-6882
helbling@wilsonconst.com
www.wilsonconst.com

From: Wendie Kellington <wk@klgpc.com>
Sent: Monday, September 09, 2024 3:30 PM
To: Wright, Rebecca <Rebecca.Wright@mail.house.gov>; MacFarlane, Joe <Joe.MacFarlane@mail.house.gov>
Cc: Ted Millar <tmillar@wwpmi.com>; Aron Faegre <faegre@earthlink.net>; Helbling, Tony <helbling@wilsonconst.com>
Subject: RE: Aurora State Airport

Hi Rebecca and Joe,

Thank you. Aron points out that the one of the attachments was mislabeled. Attached are the properly labeled ones. Thank you! Wendie

---

From: Wright, Rebecca <Rebecca.Wright@mail.house.gov>
Sent: Monday, September 9, 2024 2:35 PM
To: Helbling, Tony <helbling@wilsonconst.com>

Cc: Ted Millar <tmillar@wwpmi.com>; Aron Faegre <faegre@earthlink.net>; Wendie Kellington <wk@klgpc.com>; MacFarlane, Joe <Joe.MacFarlane@mail.house.gov>
Subject: RE: Aurora State Airport

Hi Tony (and team),

Nice to see all your names here in my inbox. I hope you've all been well and had a nice summer.

Thanks for sending this over, Tony. I have cc'd Joe MacFarlane here, who handles the congresswoman's Aviation Subcommittee portfolio. I will give him some time to digest this, and we will be in touch.

Thanks,

Rebecca Wright
District Director
(971) 403-8977

LORI CHAVEZ-DEREMER
PROUDLY SERVING OREGON'S 5TH DISTRICT

From: Helbling, Tony <helbling@wilsonconst.com>
Sent: Monday, September 9, 2024 2:24 PM
To: Wright, Rebecca <Rebecca.Wright@mail.house.gov>
Cc: Ted Millar <tmillar@wwpmi.com>; Aron Faegre <faegre@earthlink.net>; wk@klgpc.com
Subject: Aurora State Airport

Good Afternoon Rebecca,

Always good to talk with you! Please forward this on to your colleague in Congresswoman Chavez-DeRemer's office along with my contact information. Also (taking advantage of friendship connections) please share with Christine Drazan (I have no shame). I'm hopeful she could work with us as well as Representative Lewis and Senator Girod.

I can't take credit for the masterful information shared below but it (and the attached) very clearly illustrates the situation at Aurora State Airport…

The Oregon Department of Aviation (ODAV – the state) is involved in a master planning effort costing $ 1 million + in federal dollars producing airport 'alternatives" (attached) that all but guarantee the airport's demise. The state's proposed "alternatives" hold the desperately needed runway extension hostage to getting and spending hundreds of millions of dollars to fund "alternatives". These things are wholly unnecessary: like either moving Highway 551 and condemning many homes and businesses or moving the airport tower somewhere else (we note that the tower was just put in during 2015 at considerable cost), moving the entire runway and condemning all of the more than $200 million in private investment from hangars to Atlantic's FBO, to parts Columbia Helicopters and Helicopter Transport Inc., among others, so that ODAV can basically start over at the airport.

Not only are ODAV's "alternatives" wasteful, unnecessary, and dangerous, there does not seem to be any oversight – at a recent work session (9/5/24) ODAV did not even inform their own board that the airport stakeholders gave ODAV the attached fully supported alternative on 9/3/24. An alternative the FAA will almost certainly approve, that costs very little, and that achieves all legitimate goals. ODAV blames regional FAA folks for their untenable alternatives, but the ODAV "alternatives" aren't even consistent with FAA's authority. If there is someone in the FAA playing along, we should consult with their superiors, because unnecessary multi-hundreds of millions of dollars in spending is not something FAA typically insists upon (if they really are – we do not know).

Aurora State Airport is one of the busiest Oregon airports – it features a vitally important hub for Life Flight, numerous natural disaster response companies and various Oregon businesses. We understand that Marion County's governing body is concerned about the direction ODAV is going as well. We would greatly appreciate setting up a meeting with you for some advice about getting the attention of the appropriate people in the FAA about this slow unfolding disaster. Additional points:

- **None** of ODAV's three "alternatives" for the airport are tenable and all are totally unnecessary, based entirely on false assumptions, would cost taxpayers hundreds of millions of dollars to implement (dollars that do not exist), significant loss of tax revenue, loss of good jobs, loss of area tourist revenue, loss of an extremely important state and regional natural disaster asset, all to gain some 27' of separation between the runway and Highway 551, when federal standards allow imperfect compliance with, ODAV merely has to ask. As noted, the airport stakeholders have helped ODAV by giving them a fully supported "Modification to Standards" that meets all FAA standards prepared by an airport professional. Airports throughout the state and country all have such FAA approvals – ODAV just has to ask for it.
- The future of aviation is not just on the horizon, it is here… now! Electric airplanes and electric vertical aircraft (similar to helicopters) are already operating in US Airspace. Its owner has arranged to provide electrical capacity to support electric aircraft, which are the aircraft of the future. The airport boundary should be adjusted to include the one remaining remaining undeveloped through the fence property so it can be put to the aeronautical use it has been planned for since 1976. ODAV is ignoring that innovation which makes their 20-year plan not seem particularly useful for the long term and it is nothing short of appalling for the short term needs of the airport.
- ORS 836.642 clearly calls for ODAV to promote economic development and "Preserve investments in pilot sites…". These proposed alternatives do the exact opposite!

Let's set up a time to talk in person – happy to meet in Canby or up at the airport. I'm out of town till September 19 and pretty open after that. There is a group of smart people (cc'd) that would like to meet. We look forward to meeting with you and your advice.

Thank you in advance for all you do for us.

Tony Helbling
503-519-6059

Aron Faegre Airport Planning & Design 13200 Fielding Road Lake Oswego Oregon 97034 aron@faegre.org

Aurora State Airport (UAO)
Proposed Modification of
Runway Object Free Area (ROFA) Design Standards

Prepared by: Aron Faegre, AIA, PE
Aron Faegre Airport Planning & Design

August 29, 2024

This memorandum provides an analysis and methodology by which a Modifications of FAA Airport Design Standards (MOS) at the Aurora State Airport (UAO), for the Runway Object Free Area (ROFA) can be justified as:

> "… resulting in an acceptable level of safety, useful life, lower costs, greater efficiency, or the need to accommodate an unusual local condition on a specific project through approval on a case-by-case basis." - FAA Order 5300.1G, page 1.

as defined and permitted under FAA Order 5300.1G Modifications to Agency Airport Design, Construction, and Equipment Standards[1].

1. BACKGROUND

The Aurora State Airport is surrounded by farm lands, near Aurora, Oregon, at the northern end of Marion County. It primarily serves aviation businesses involved with:

- emergency medical transport[2],
- aviation heavy-lift helicopter fire-fighting and power line construction companies (for which fixed wing aircraft are essential for support),[3]
- business jets for numerous major national corporations based within 10 miles,
- aircraft manufacturing for the S-LSA (Special Light-Sport Aircraft) and kit-build

[1] FAA Order 5300.1G Appendix A specifically gives FAA Office of Airport (ARP) and Region the authority to issue a MOS for Runway Object Free Areas. The Order can be downloaded at: https://www.faa.gov/documentLibrary/media/Order/order-5300-1G-modifications-to-standards.pdf .
[2] Regional headquarters for Life Flight Network, with bases all over Oregon, Washington, Idaho, Montana, and Nevada.
[3] Columbia Helicopters, Helicopter Transport Services, Wilson Construction, companies that work internationally with headquarters at Aurora Airport. The use of the Aurora Airport runway is essential to these companies for rapid providing of crews, equipment, and repairs to helicopters in active service of fighting fires, moving power lines, or doing rescue, relief, or humanitarian work.

industry[4], and

- other general aviation aircraft using the airfield for business, pilot training, and recreational flying.

There is no scheduled air service using the airport. The State of Oregon Department of Aviation (ODAV) owns, governs, and manages the public lands of the airport. Most of the business aircraft based at the airport access the runway via through-the-fence permits with ODAV.

Flights by based business jets, such as a Challenger 300, dictate that the Airport Reference Code is C-II. Due to the geometry of the existing site, the airport does not meet current FAA design standards for the ROFA, due primarily to adjacent Highway 551 to the west of the runway.

Most recently ODAV's planned solution[5] to meeting these standards ("Refined Preliminary Alternatives Summary", by Century West Engineering, dated July 31, 2024) is one of only two options:

- relocate the highway further west, (which involves acquiring both private residential and commercial properties further west), or
- relocate the runway, taxiway, and control tower east (which involves acquiring many acres of existing private property already developed with hangars, taxilanes, and aprons for aviation uses) and demolishing numerous large 40,000 square foot aviation hangars along the taxiway.

Both options have very high financial and environmental costs (probably in the greater than $100 million range), which would make them difficult to ever be implemented. If this master plan is approved as currently planned, and one of these options were not implemented, then ODAV and FAA have reported that the airport would only receive maintenance funding and no additional safety improvement funds. This would result in the airport not keeping pace with the aviation industry standards of safety. The second option (moving the runway, control tower, and demolishing hangars), If implemented, would in addition force closure of many of the major medical transport and fire-fighting facilities on the airport, and would put many of the airport's 1,500 employees out of jobs.

It is noted that in the 2012 Airport Layout Plan (ALP), approved (signed) by both ODAV and FAA, the airport also had the same Runway Design Code (RDC) status of C-II and

[4] Van's Aircraft www.vansaircraft.com the international leader in S-LSA produced aircraft.
[5] Refined Preliminary Alternatives Summary document dated July 31, 2024 by Century West Engineer can be downloaded at: https://publicproject.net/files/UAOAMP/uao-refined-preliminary-alternatives-summary-1-.pdf?d952c4adef .

listed a MOS as the solution to the non-standard ROFA limitation on the west property line. At that time there was consensus between ODAV and FAA that a MOS was a reasonable solution.

This memorandum provides the evidence to show that the 2012 ALP was a good approach to resolution of the ROFA, and that it can reasonably be continued. This report demonstrates that there is an acceptable level of safety through modifying the ROFA standard for the specific deviation to standards located on the west side of the runway.

FAA standards for different airports ROFA's vary from 250 foot width, to an 800 foot width, depending on aircraft type using the airport. As will be shown below, the primary reason justifying the modification is that the going from B-II to C-II category is just where the 500-foot required ROFA width changes to an 800-foot wide required ROFA - yet this is the same width required for all RDC category aircraft all the way to E-VI -Portland International Airport, San Francisco Airport, and every other international airport in the country. UAO will never have the larger size of aircraft those airports accommodate – Boeing 737's to Boeing 777's – so a slight reduction in width on the west side provides a level of safety appropriate for UAO, which will always serve only much smaller aircraft.

Modifications of standards for ROFA's are common at even large national airports. For example, recently several MOS were adopted at San Jose International Airport for deficiencies in the ROFA, as well as for runway-taxiway separations, and for runway object free areas[6]. It even appears that Portland International Airport (PDX) may have their airport perimeter fence, the shoulder of NE Marine Drive, and improper grading within the 400-feet area from runway centerline, at the northeast corner of the ROFA for Runway 10L.

This memorandum provides the detailed technical background and mathematically calculated justification, needed for the FAA and ODAV to again approve a MOS for the ROFA at Aurora State Airport.

2. MOS PROCESS

The process for gaining a modification of standards is provided in FAA AC 150/5300-13B Airport Design[7] in Section 2.8. It states, and we provide commentary after each paragraph as to acceptability:

[6] Norman Y. Mineta San Jose International Airport Runway Incursion Mitigation/Airfield Design Standards Analysis, November 27, 2017. Justification for ROFA modifications in this document were often simply the practical and cost issues of modifying major adjacent highways, similar to what is at issue in a much smaller Aurora Airport.
[7] FAA AC 150/5300-13B Airport Design Available free on line at:
https://www.faa.gov/documentLibrary/media/Advisory_Circular/AC-150-5300-13B-Airport-Design-Chg1.pdf

2.8 ***Modification of Standards.***

Site-specific conditions may make it impractical to meet all FAA design standards at an airport. The FAA considers, on a case-by-case basis, modifications to design standards that result in an acceptable level of safety and efficiency. Specific operational controls may be necessary to establish an acceptable level of safety for operation of aircraft at the airport. FAA Order 5300.1 establishes FAA policy for administering airport requests for modification of standards. See paragraphs 2.4 and 2.5.

This memorandum provides this information and finds that no specific operational controls are necessary, see comments on paragraph 2.4 below.

2.8.1 The FAA views an approved modification of standards as an interim measure intended to mitigate unique site-specific conditions. Unless the FAA explicitly states otherwise in the approval action, the FAA expects airports with approved modifications to pursue ways to meet design standards. This may occur incrementally over time or at such time it becomes practical to correct the non-standard condition.

The FAA and ODAV can work with Oregon Department of Transportation on master planning future revisions to State Highway 551 so that it can be corrected "at such time it becomes practical." Also, there are potential options where ODAV and ODOT could jointly agree to relocate the airport perimeter fence closer to Highway 551, which could be an "incrementally" established improvement.

2.8.2 The FAA will not consider any request to modify design standards associated with the following:

- *RSA dimensions*
- *OFZ dimensions*
- *Approach or departure surface dimensions*
- *Standards established within a regulation (e.g., stopway, clearway).*

The ROFA is not one of these.

2.8.3 An airport seeking FAA approval of modification to a design standard submits a request using the Modification of Standards application tool within the Airport Data and Information Portal (ADIP) at https://adip.faa.gov. The FAA relies on the following information, in part, to determine the acceptability of a modification to FAA design standards:

- *Information on the standard proposed for modification.*
- *Description of proposed modification and why the airport cannot meet standards.*
- *Statement addressing how modification will provide an acceptable level of safety, economy, durability, and workmanship.*
- *Listing of any special operational measures necessary to accommodate the modification.*

This document was prepared to provide the analysis needed for ODAV to submittal for the MOS per Section 2.4.

2.4 Addressing Non-standard Airport Conditions.

> *The FAA expects airport owners to address non-standard conditions through the airport planning process. The FAA acknowledges that conformance to current standards is not always practical. However, the FAA expects airports to continue to investigate mitigation measures, whether in one or multiple phases, and correct the non-standard conditions over time.*

It is important to re-emphasize the above statement, that the FAA here "acknowledges that conformance to current standards is not always practical." Further, per this paragraph, the current master planning activity is the appropriate place for this analysis and the formal establishment of a MOS for the ROFA. This report and analysis identifies intermediate steps that can be taken, such as relocating the airport perimeter fence, that will iteratively move the airport closer to compliance.

This analysis utilizes an FAA established safety analysis methodology to show that the MOS provides an acceptable level of safety. The study found no special measures needed to accommodate the modification.

3. METHODOLOGY

In 2011, the Transportation Research Board (TRB) released Airport Cooperative Research Program (ACRP) Report #51 – Risk Assessment Method to Support Modifications of Airfield Separation Standards. The ACRP is funded by the Federal Aviation Administration (FAA). Report #51 is used to support the ROFA MOS requested at Aurora State Airport.

The proposed ROFA MOS is modeled in this report in accordance with Appendix A – Risk Assessment Methodology of ACRP Report #51[8].

This report uses risk plots, along with the annual number of operations, to analyze the cumulative risks associated with Runway to Object Separations. The operations numbers at UAO are taken from the current draft Master Plan, and are numbers already approved by the FAA in a letter[9] to ODAV dated November 15, 2023 (corrected January 23, 2024). For sake of a conservative analysis, we are using the most distant forecast projects for the year 2041, which are:

- 90,231 total operations all RDC categories, of which
- 862 operations are of RDC C-II and D aircraft

[8] ACRP Report #51 – Risk Assessment Method to Support Modifications of Airfield Separation Standards is available free on line at: https://nap.nationalacademies.org/catalog/14501/risk-assessment-method-to-support-modification-of-airfield-separation-standards

[9] Federal Aviation Administration (FAA) Aurora (UAO Aviation Activity Forecast Approval Airport Improvement Program Grant Number 3-41-0004-022-2021 available at: https://publicproject.net/files/2024-01/Aurora-Airport/uao-forecast-approval-20231115-corrected-20240123.pdf?57af6c19b7

For operations involving the runway, per the methods of Report #51, the risk is analyzed based on three distinct phases of flight:

a. Landing - Airborne Phase
b. Landing - Ground Phase
c. Takeoff

The separation distance from the runway centerline to an object is used with the associated risk plot to calculate the risk of collision per operation.

The risk of collisions per operation is then analyzed along with the number of annual airport operations for the appropriate phase of flight to determine the predicted frequency of occurrence. The frequency of occurrence is used to determine the FAA likelihood level using Table A-3 from ACRP Report #51 which is shown below:

Table A-3. FAA likelihood levels (FAA, 2010).

	General	Airport Specific	ATC Operational	
			Per Facility	NAS-wide
Frequent A	Probability of occurrence per operation is equal to or greater than 1×10^{-3}	Expected to occur more than once per week or every 2,500 departures (4×10^{-4}), whichever occurs sooner	Expected to occur more than once per week	Expected to occur every 1–2 days
Probable B	Probability of occurrence per operation is less than 1×10^{-3}, but equal to or greater than 1×10^{-5}	Expected to occur about once every month or 250,000 departures (4×10^{-6}), whichever occurs sooner	Expected to occur about once every month	Expected to occur several times per month
Remote C	Probability of occurrence per operation is less than 1×10^{-5} but equal to or greater than 1×10^{-7}	Expected to occur about once every year or 2.5 million departures (4×10^{-7}), whichever occurs sooner	Expected to occur about once every 1–10 years	Expected to occur about once every few months
Extremely Remote D	Probability of occurrence per operation is less than 1×10^{-7} but equal to or greater than 1×10^{-9}	Expected to occur once every 10–100 years or 25 million departures (4×10^{-8}), whichever occurs sooner	Expected to occur about once every 10–100 years	Expected to occur about once every 3 years
Extremely Improbable E	Probability of occurrence per operation is less than 1×10^{-9}	Expected to occur less than once every 100 years	Expected to occur less than once every 100 years	Expected to occur less than once every 30 years

Note: Occurrence is defined per movement.

Source: ACRP Report #51

The key takeaway from Table A-3 is that for a specific airport, if the likelihood of incidence is less than once every 100 years it is considered a “Extremely Improbable” Class E occurrence.

A Hazard Severity Classification is then assigned based on the worst credible outcome of an incident. Since the ACRP method is based on wingtip separation, the report states that: “From the point of view of risk and based on the records of incidents and accidents,

the worst credible consequence expected for wingtip collisions of two taxiing aircraft is aircraft damage" (ACRP Report #51 page 19). A similar aircraft damage expectation would be a wingtip collision with the airport perimeter fence, which is the ROFA limitation examined in this report.

The Hazard Severity Classifications were determined in accordance with Table A-4 FAA Severity Definitions from ACRP Report #51 and are shown below:

Table A-4. FAA severity definitions (FAA, 2010).

Hazard Severity Classification				
Minimal 5	**Minor 4**	**Major 3**	**Hazardous 2**	**Catastrophic 1**
No damage to aircraft but minimal injury or discomfort of little consequence to passenger(s) or workers	- Minimal damage to aircraft; - Minor injury to passengers; - Minimal unplanned airport operations limitations (i.e. taxiway closure); - Minor incident involving the use of airport emergency procedures	- Major damage to aircraft and/or minor injury to passenger(s)/ worker(s); - Major unplanned disruption to airport operations; - Serious incident; - Deduction on the airport's ability to deal with adverse conditions	- Severe damage to aircraft and/or serious injury to passenger(s)/ worker(s); - Complete unplanned airport closure; - Major unplanned operations limitations (i.e. runway closure); - Major airport damage to equipment and facilities	- Complete loss of aircraft and/or facilities or fatal injury in passenger(s)/ worker(s); - Complete unplanned airport closure and destruction of critical facilities; - Airport facilities and equipment destroyed

Source: ACRP Report #51

Then, using both the FAA likelihood level and the Hazard Severity Classification the risk is then analyzed using Figure A-1 FAA Risk Matrix from ACRP Report #51, shown below:

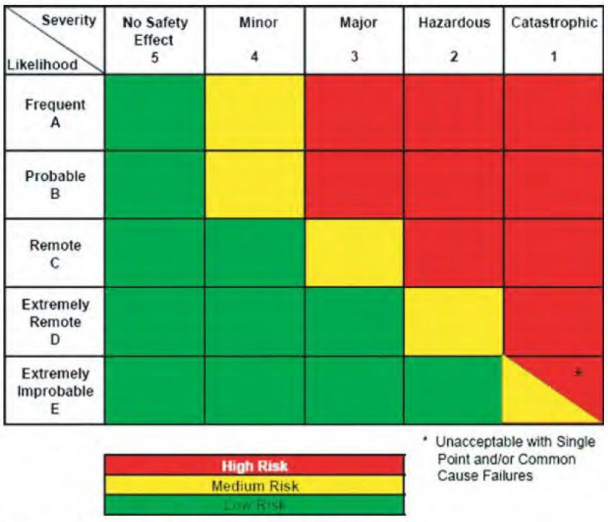


Figure A-1. FAA risk matrix (FAA, 2010).

Source: ACRP Report #51

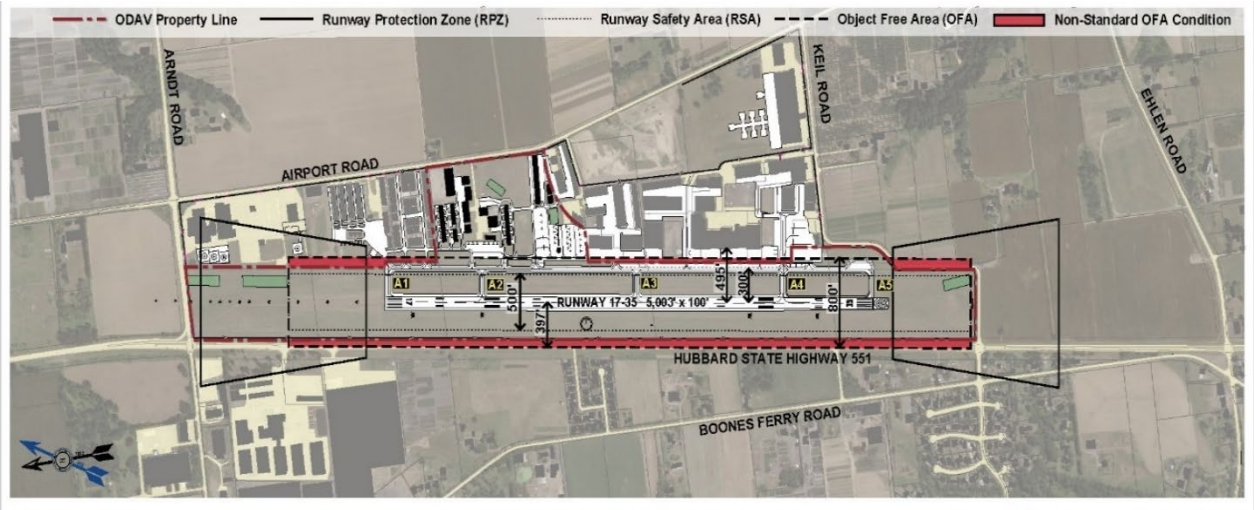
Based on Figure A-1 if the incident is Extremely Improbably (i.e. more than 100 years probability) the risk is considered “Low,” except for an incident considered catastrophic. We will use these graphs to evaluate the results from the detailed risk analysis of UAO below.

4. UAO ANALYSIS

In 2012 Master Plan and ALP established the UAO runway RDC, given existing based aircraft, as C-II, up from a B-II. The required ROFA width of a B-II runway is 500 feet centered on the runway. As it turns out, any runway of higher RDC than a B-II requires 800 feet in width. Thus, the UAO required C-II ROFA width is 800 feet centered on the runway. This 800-foot width is the standard used for aircraft ranging from a Challenger 300 business jet to the largest Boeing 777 or even the largest military aircraft. The 2012 approved ALP lists the ROFA deviation as a modification to standards, since the airport perimeter fence and Highway 551 were within the ROFA.

The UAO forecast of operations predicts that by the year 2041 there will be 90,230 annual operations at the airport, of which 862 would be an RDC above the B-II category. Thus, the 89,368 operations by B-II or lesser category clearly are operating well within ROFA safety standards, as the existing runway to road separations provide more than the 500-foot required width. It is just the 862 operations that need to be analyzed for ROFA safety relative to the required 800-foot width.

The deficiencies in the existing Runway OFA at UAO are shown in the Figure below:



UAO Figure A: Highway 551 Shown as ROFA Deviation Object
Source: Century West Engineers, Aurora State Airport Draft Airport Master Plan, Working Paper No. 1, Figure 2-15, November 2023 (Updated)

The current ROFA object deficiencies are:

d. Hubbard State Highway 551 for which the OFA penetrates 3 feet beyond the highway centerline. (368' to 377' clear width available from outer edge of highway gravel shoulder to Runway CL)
e. Perimeter Fence Inside OFA (312' clear width from Runway CL)

Potentially the airport fence could be relocated to the east edge of the 12-foot-wide gravel shoulder, since both the highway and the airport are owned by the State of Oregon. There can be an agreement between ODOT and ODAV to allow this. Relocating the fence in this way would result in a minimum width of the ROFA on the west side of the runway, to a 368-foot clearance - which would be only 32 feet out of conformance.

However, we will evaluate the ROFA for the existing conditions, and thus use the location of the airport perimeter fence as the maximum ROFA available at this time.

When analyzing the risk associated with a reduction in Runway OFA it is important to consider the purpose of the design standard. Paragraph 3.12 of Advisory Circular 150/5300-13B defines the ROFA but does not give detailed design rational behind the standard:

> *"ROFA is a clear area limited to equipment necessary for air and ground navigation, and provides wingtip protection in the event of an aircraft excursion from the runway"*

Appendix I, Paragraph I.8 of Advisory Circular 150/5300-13B provides the only available reference to the design rationale behind the Runway OFA width:

> *"The ROFA serves two principal purposes: 1. Development buffer in proximity to a runway, and 2. Wing clearance for a runway excursion event to the outer limit of the RSA. `*

Appendix I, in Section I.8.2, also clarifies that part of the "development buffer" intent is:

> *"Protection of the ROFA also reserves space for future development of a parallel taxiway that permits proper alignment of aircraft at a holding position on an entrance taxiway."*

However, for the given physical layout of UAO there can be no plan for a parallel taxiway on the west side of the runway, because of the location of Highway 551 and that there never can be hangars or other aviation uses on that side of the runway. Therefore, that leaves the only ROFA purpose for UAO as only "wingtip clearance for a runway excursion" which is precisely what this analysis provides.

Below we will analyze resolving the ROFA utilizing the risk analysis method of ACRP Report #51, for the case:

- No Change to existing ROFA conditions on West Side of Runway (Hwy 551 and Airport Perimeter Fence remain as existing) resulting in a 312-foot clearance to runway CL.

Per the methodology of ACRP Report 51, we analyze the risks for each of the takeoff and landing scenarios. For landing operations, the analysis is further divided into two parts: airborne (approach) phase and ground (landing rollout) phase. However, because the risk of veering off the runway during takeoff is so much less than for during landing, the methodology indicates that usually it is not necessary to evaluate takeoff option except if there are runways that only are used for takeoffs and not for landings. We will do that takeoff evaluation in any case, just to clearly determine what it is in the UAO context.

Since the existing runway to taxiway separation meets the current criteria for a C-II airport, for this study that analysis would seem unnecessary. However, we will include that option in this report because it provides a baseline of safety that the AC 150-5300-13B Airport Design Standards have determined is an acceptable and appropriate level of safety for a C-II airport.

Thus, for this UAO ROFA analysis separate risks are developed for each of:

1. Airborne Phase (Landing) is for instrument approaches which terminate the approach as a missed approach, and the risk is hitting another object such as hitting the airport perimeter fence or a vehicle on Highway 551 (using ACRP Report 51 Fig. 31); “the airborne risk is computed only for missed approaches” (ACRP Report 51, page 21).
2. Ground Phase (Landing Rollout) where risk is veering off the runway into the reduced width ROFA and hitting the fence or a car on Highway 551 (using ACRP Report 51 Fig 42). Figure 42 is based on the assumption that the risk is between the two wingtips of two aircraft, one aircraft on the edge of the runway and the other at the centerline of a taxiway. The ACRP makes clear that the x-axis distance on the Risk Figures are centerline of runway to centerline of taxiway because the risk is assumed aircraft to aircraft. However, the predicted risk is based on the wingtip-to-wingtip distance. When using the Risk Figures for objects (not aircraft) like a fence or road (which has no wings), half of the wingspan should be added to the distance to compensate for the wingtip-to-wingtip assumption. Thus, per Group II standards, the clearance distance used for Figure 42 should add half of 79 feet (equals 39.5 feet) of additional clearance, which would create a total of 351 feet to use in Fig. 42. The risk shown with the 312 feet and the 351 feet are each shown in figures.

3. Ground Phase (Takeoff) where risk is veering off the runway into the reduced width ROFA and hitting the fence or a car on Highway 551 (using ACRP Report 51 Fig 49).

Finally, to have more relevant data, we will also perform the risk analysis of the standard required 300-foot separation between runway centerline and taxiway centerline for a landing, which is the level of safety the AC 150/5300-13B sets for in a C-II airport:

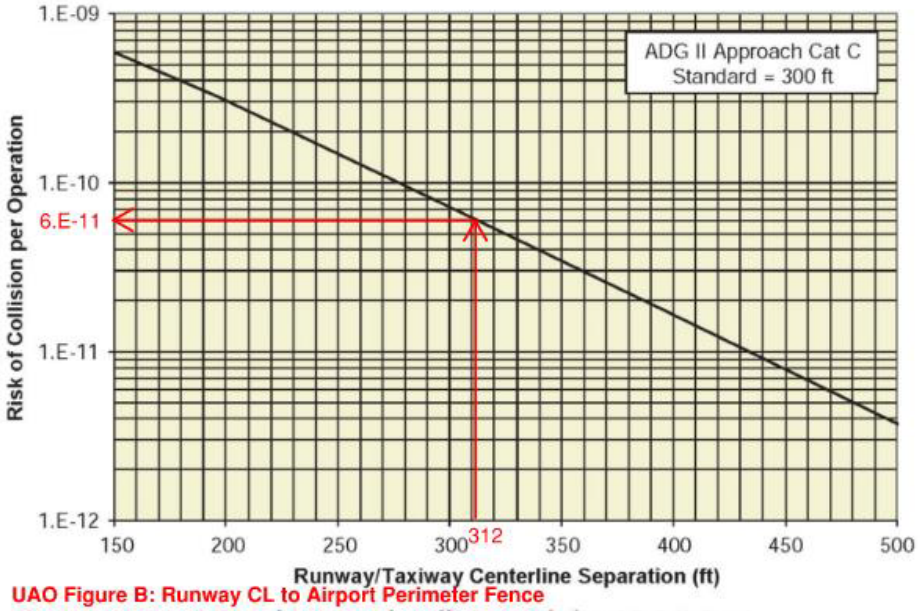
4. Ground Phase (Landing Rollout) where risk is veering off the runway into the taxiway (using ACRP Report 51 Fig 42).

This data will give us an example of an acceptable level of safety utilized in AC 150/5300-13B for a C-II airport.

5. Specific Analysis: Proposed MOS Option - No Change to Existing ROFA Conditions (312' Separation from Runway Centerline to Airport Fence)

The Perimeter Fence at the west side is located 312 feet from the runway centerline. The risks associated with leaving it there as a modification of standards, for each of the phases of flight are analyzed below:

1. Airborne Landing Phase Risk from Reduced ROFA – For a very conservative analysis we will assume that this includes all approach to landings, not just missed approaches. Using the separation of 312' and Figure AA-33 in Appendix A of ACRP Report #51, the following provides a risk level 6.0E-11 of occurrence per landing (which as an inverse, is one chance in a 16.7 trillion landings) that an aircraft gets 312' from the runway centerline. This can be seen in the figure below:

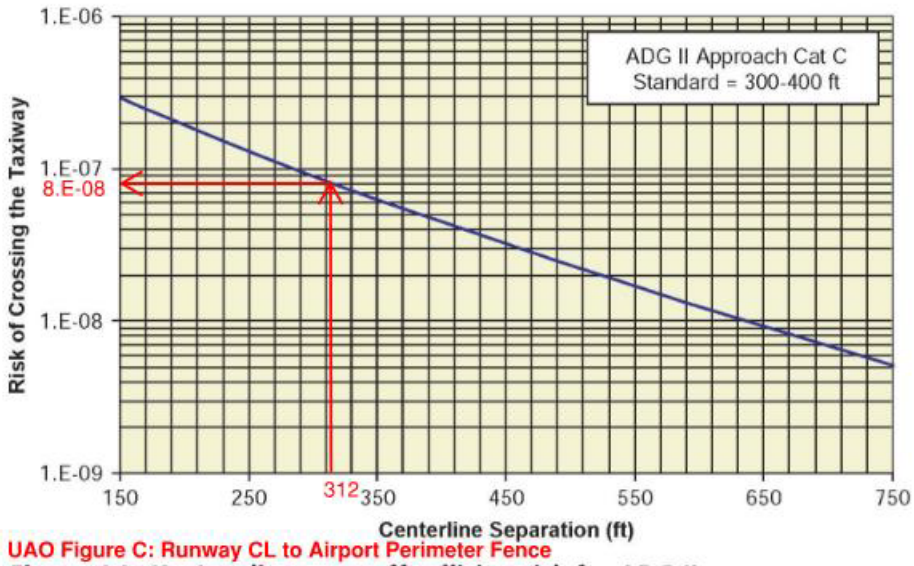


UAO Figure B: Runway CL to Airport Perimeter Fence

Figure AA-31. Missed approach collision risk for ADG II Cat I.

The current annual number of landing operations at UAO is approximately 45,115 or half of the 90,230 annual operations. As the risk is one incident in every 16.7 trillion landings, the time between occurrences is calculated as 16 trillion landings divided by 45,115 landing operations per year which equates to one incident every 369,000 years. Thus, this risk is of no significance.

2. Landing Roll Phase Risk for Reduced ROFA - Using the separation of 312' and Figure AA-43 in Appendix A of ACRP Report #51, provides a risk level 8.0E-08 or in the inverse: one chance in 12.5 million landings. This can be seen in the figure below:



UAO Figure C: Runway CL to Airport Perimeter Fence

Figure AA-42. Landing veer-off collision risk for ADG II.

As the risk is one incident in every 12.5 million landings, the rate of occurrence is calculated as 12.5 million landings divided by 45,115 landings per year which equates to one incident every 277 years.

Using the ACRP described adjustment when the object is not another aircraft and half the C-II wingspan can be added to the clearance distance, results in a separation of 351' and Figure AA-43 in Appendix A of ACRP Report #51, provides a risk level 6.0E-08 or one chance in 16.7 million landings. This can be seen in the figure below:

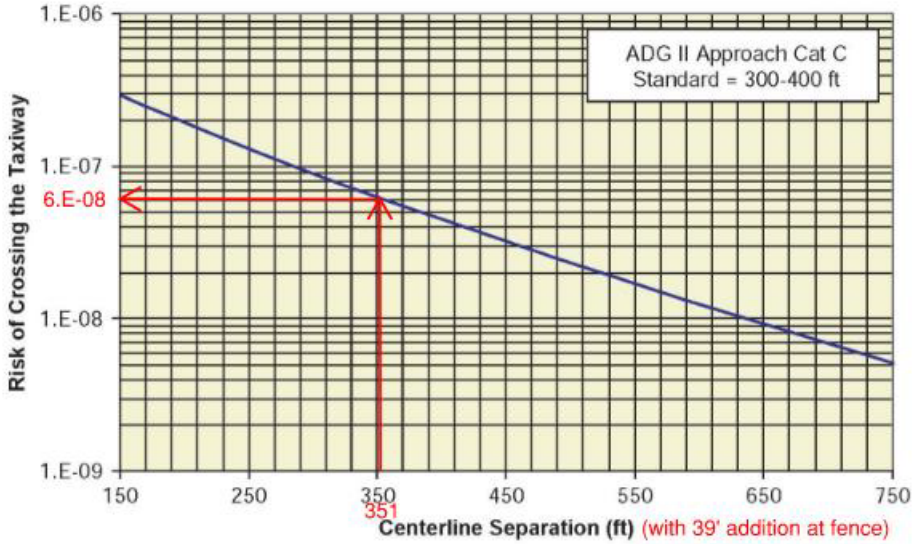
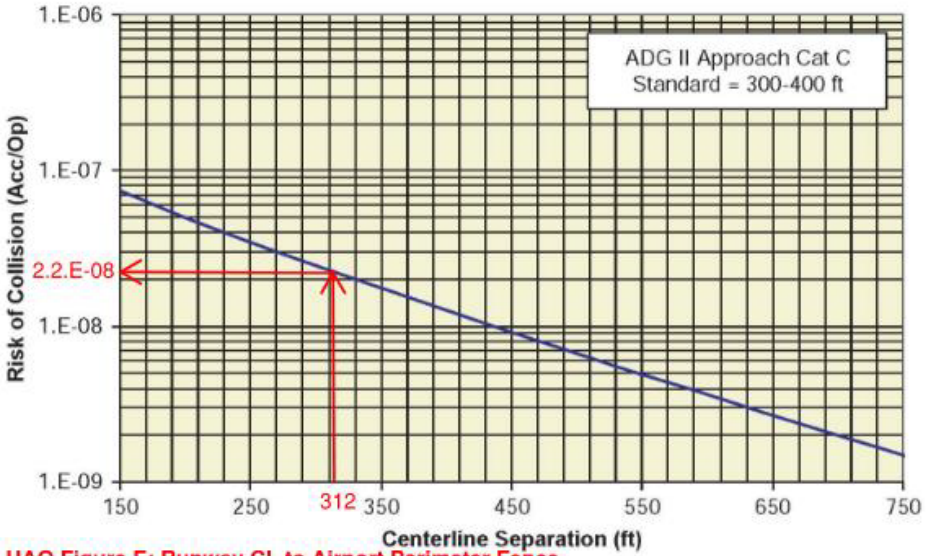


Figure AA-42. Landing veer-off collision risk for ADG II.
UAO Figure D: Runway CL to Airport Perimeter Fence Including Wingspan adjustment

As the risk is one incident in every 16.7 million landings, the rate of occurrence is calculated as 16.7 million landings divided by 45,115 landings per year which equates to one incident every 369 years.

3. Takeoff Roll Phase Risk for Reduced ROFA - Using the separation of 312' and Figure AA-49 in Appendix A of ACRP Report #51, provides a risk level 2.2E-08) or one chance in 45.5 million takeoffs. This can be seen in the figure below:

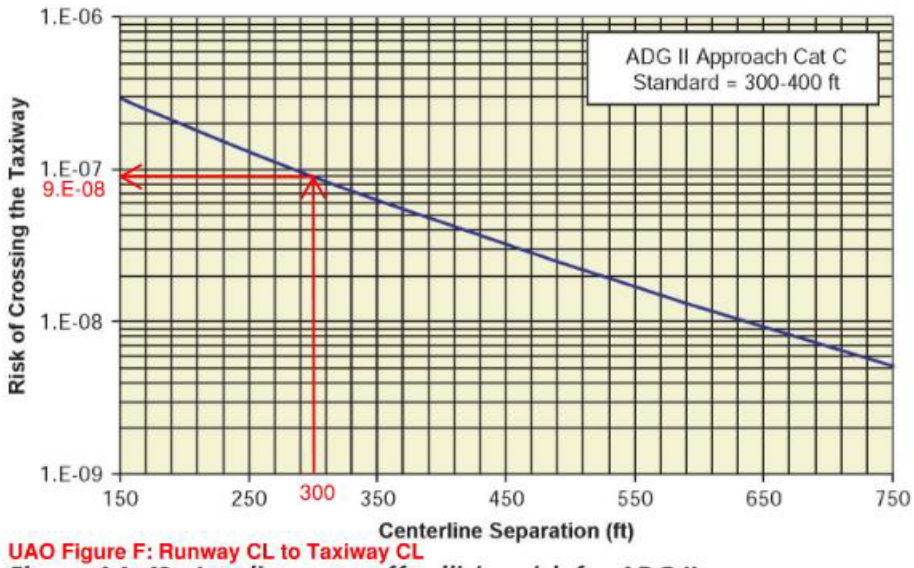


UAO Figure E: Runway CL to Airport Perimeter Fence
Figure AA-49. Takeoff veer-off collision risk for ADG II.

As the risk is one incident in every 45.5 million takeoffs, the rate of occurrence is calculated as 45.5 million takeoffs divided by 45,115 takeoffs per year which equates to one incident every 1,008) years.

Finally, as a test of the level of safety that AC 150/5300-13B considers acceptable we check what the predicted risk level is of the existing runway-taxiway separation considered appropriate[10] by FAA.

4. Landing Roll Phase Risk to Taxiway Consistent with Safety Standards of AC 150/5300-13B - Using the separation of 300' and Figure AA-43 in Appendix A of ACRP Report #51, provides a risk level 9.0E-08 or one chance in 11.1 million landings. This can be seen in the figure below:



UAO Figure F: Runway CL to Taxiway CL

Figure AA-42. Landing veer-off collision risk for ADG II.

As the risk is one incident in every 11.1 million landings, the rate of occurrence is calculated as 11.1 million landings divided by 45,115 landings per year which equates to one incident every 246 years.

[10] Note that Section 3-24 of Order 5100.38D Change 1 states that the FAA will not fund airport safety greater than that in the Airport Design standards, so the standard set by the runway-taxiway separation is a significant number. Order 5100.38D Change 1 can be downloaded for free at: https://www.faa.gov/documentLibrary/media/Order/AIP-Handbook-Order-5100-38D-Chg1.pdf

6. Conclusions

Considering the risk of each phase of flight, the risk of collision during the landing roll is the controlling factor. The Hazard Severity Classification for this type of operation would be major and the acceptable probability of occurrence is remote (1E-05) or less than once every 1-10 years. The following table summarizes the risk associated with each phase of flight:

Phase of Flight	Rate of Occurrence	Acceptable Level
Airborne Phase	Once every 369,000 years	Yes
Landing Roll Phase	Once every 277 years (or 369 years with calculation adjustment for fence object in lieu of wing object)	Yes
Takeoff Roll Phase	Once every 1,000 years	Yes

A runway to object separation of 312’ provides an acceptable level of safety as the controlling occurrence is once every 277 years (or 369 years with the adjustment for wingspan at the fence as allowed in the ACRP method). This is much less risk than the once per 100 years FAA standard shown in Table A-3 and results in a Category E “Extremely Improbable” occurrence. Further, per ACRP’s method, a wingtip to fence occurrence is considered by ACRP’s method to be a Table A-4 Minimal Severity occurrence. This combination via Figure A-1 concludes that the outcome as Low Risk.

Figure UAO F shows that the existing risk of occurrence between the existing runway and existing taxiway, which fully meets FAA standards, is one in every 246 years. This means that the risk to an occurrence at the taxiway, is much less (i.e. longer duration between events) than the FAA’s 100-year standard. The risk of collision with the perimeter fence is then even much less than that of a taxiway collision.

Finally, there is an incremental improvement option of ODAV and ODOT coming to an agreement to move the perimeter fence further west, to the east edge of the 12’ wide gravel shoulder, which would result in a 368-foot separation. If the 39.5-foot wing span correction is added at the new fence location, this results in an equivalent distance of 407 feet for use on Figure AA-42. That in turn would result in an ACRP predicted probability occurrence being once every 515 years, almost half the risk of a taxiway collision.

Given that the commercial use of aviation is itself only around 100 years old, these numbers of one predicted occurrence at the existing airport fence every 277 or 369 years, demonstrates the high level of safety that will be maintained at Aurora Airport with this MOS.

Given the regional and national importance of Aurora Airport for emergency medical, firefighting, and emergency power line moving, along with the use by local national corporations, using the MOS ensures the airport can continue to upgrade with safety improvements, and can continue to support the approximately 1,500 employees that rely on the airport for their livelihood.

This study shows definitively that the 2012 signing off on the Aurora Airport master plan and ALP with a modification of standards for the ROFA, by FAA and ODAV, was a reasonable and appropriate action to take. The same action should be taken for the current 2024 master plan work.

Author: Aron Faegre is an architect, civil engineer, physicist, and pilot who has been the lead planner and designer on over two hundred airport planning and development projects in Oregon, Washington, California, New York, and British Columbia over the past 35 years. He has a Master of Architecture from MIT and a Bachelor of Physics from Reed College.

ARON FAEGRE AND ASSOCIATES
AVIATION PLANNING AND DESIGN SERVICES FIRM PROFILE

Introduction

Aron Faegre and Associates is a multi-disciplinary firm with a special interest in performing planning and engineering for aviation projects. The principal of the firm, Aron Faegre, personally manages the firm's key projects and is an aviation planner, architect, civil engineer, and landscape architect. He is also an instrument rated commercial pilot.

Mr. Faegre's firm has completed aviation projects for the following clients:

- Oregon Department of Aviation
- Port of Walla Walla
- Quinault Indian Nation
- Horizon Air
- Southwest Airlines
- Columbia Helicopters
- Helicopter Transport Services
- Oregon Health Sciences University
- Kaiser Hospital
- Atlantic Aviation
- The Port of Portland
- Port of Columbia County Scappoose)
- The City of Portland
- City of Pendleton
- Washington State DOT
- Life Flight Network
- Van's Aircraft
- City of Newberg
- Transwestern Aviation
- Flightcraft PDX

Aviation Services

Aron Faegre & Associates provides consulting services on all aspects of aviation facilities design including:

- Airport Master Plans
- Maintenance Hangars and Shops
- Storage Hangars
- Terminals and Concourses
- Airport Layout Plans
- Runway Design
- Access Road Design
- Instrument Approach Drawings
- Apron Design
- Airport Economic Impact
- Noise Abatement Planning
- Environmental Assessment
- Fixed Base Operator Facilities
- Air Cargo Facilities
- Tenant Fit-up
- Obstruction Survey
- Taxiway Design
- Airport Security Design
- Aviation Land Use Planning
- Public-Private Partnerships

Aron Faegre, P.E, AIA is the principal of AFA, a multi-disciplinary planning and design firm. Mr. Faegre has a Master's Degree in Architecture from the Massachusetts Institute of Technology, during which he was also a National Science Foundation Fellow for three years. Mr. Faegre has a Bachelor's Degree in Physics from Reed College and has published research in scientific journals. He is licensed as a civil engineer, architect, and landscape architect. He is a commercial pilot with instrument rating. He also serves on the board of the Airway Science for Kids, an Oregon non-profit, where he also leads the TeenFlight program – where teams of 15 teenagers build an RV-12is aircraft, and then get to experience flying the airplane they built.

Outlook

Fw: Idea for ODAV to work with ODOT

From Brandy Steffen <brandy.steffen@jla.us.com>
Date Mon 2024-10-07 9:27 AM
To Ashley Balsom <ashley.balsom@jla.us.com>; Jen Winslow <Jen.winslow@jla.us.com>

FYI

BRANDY STEFFEN | JLA PUBLIC INVOLVEMENT
brandy.steffen@jla.us.com » 503-235-5881 » jla.us.com
Woman-led, community-centered, for 35 years and counting
Meeting + email hours 9 a.m.–5 p.m. Monday–Thursday. Administrative-only hours on Friday.
Check my availability » Schedule a 30 minute check-in

From: BEACH Anthony <Anthony.BEACH@odav.oregon.gov>
Sent: Friday, October 4, 2024 4:30 PM
To: Samantha Peterson <SPeterson@CenturyWest.com>; Brandy Steffen <brandy.steffen@jla.us.com>
Cc: W. Matt Rogers <WRogers@CenturyWest.com>; THOMAS Alex R <Alex.R.THOMAS@odav.oregon.gov>
Subject: FW: Idea for ODAV to work with ODOT

Hi all, please see my response to Tony Helbling. Please include this in the record.

Thank you,

Tony Beach
OREGON DEPARTMENT OF AVIATION
STATE AIRPORTS MANAGER
OFFICE 503-378-2523 **CELL** 503-302-5455
M-F 7:30am – 4pm

From: BEACH Anthony
Sent: Friday, October 4, 2024 4:28 PM
To: Helbling, Tony <helbling@wilsonconst.com>; SUGAHARA Kenji <Kenji.SUGAHARA@odav.oregon.gov>
Cc: ZWERDLING Naomi <Naomi.ZWERDLING@odot.oregon.gov>
Subject: RE: Idea for ODAV to work with ODOT

Hi Tony,

ODAV and the Planning Team appreciate your feedback and suggestions.

The Alternatives developed by the team address the nonstandard conditions and needs of the airport, as discussed in Chapter 4 - Facility Requirements. One of the most challenging and critical nonstandard conditions being addressed is for the Runway Object Free Area (ROFA), which is 800 feet wide centered on the runway centerline. The FAA defines the ROFA as “a clear area limited to equipment necessary for air and ground navigation and provides wingtip protection in the event of an aircraft excursion from the runway.” The ROFA overlaps portions of Highway 551.

The Planning Team has focused on the least impactful and most feasible solutions. Unfortunately, there is not enough space to move the fence without at least moving the highway or the runway to resolve the ROFA issue. All three Refined Alternatives presented in the July 30th PAC meeting would bring the ROFA and fence into compliance with FAA standards.

Thanks again for your input, we look forward to discussing more at the October 15th PAC Meeting.

Anthony Beach, C.M., ACE
OREGON DEPARTMENT OF AVIATION
STATE AIRPORTS MANAGER
M-F 7:30am – 4pm

OFFICE 503-378-2523 **CELL** 503-302-5455

EMAIL Anthony.Beach@odav.oregon.gov

3040 25TH STREET SE, SALEM, OR 97302

WWW.OREGON.GOV/AVIATION

From: Helbling, Tony <helbling@wilsonconst.com>
Sent: Wednesday, October 2, 2024 2:02 PM
To: BEACH Anthony <Anthony.BEACH@odav.oregon.gov>; SUGAHARA Kenji <Kenji.SUGAHARA@odav.oregon.gov>
Cc: ZWERDLING Naomi <Naomi.ZWERDLING@odot.oregon.gov>
Subject: Idea for ODAV to work with ODOT

This message was sent from outside the organization. Treat attachments, links and requests with caution. Be conscious of the information you share if you respond.

Kenji and Tony,

I and another PAC member (Naomi – cc'd) are exploring an idea that I'd like to propose to you. This just might be the win/win situation that if considered in coordination with a phased approach alternative, well, it just might make everyone happy!

Proposed idea…

Rather than shift Highway 551 to the west and/or tear down hangars fronting the runway to the east, what if we move the western airport fence, approximately 30' to the west? This would get it further from the runway.

The property spanning the length of the airport x 30' would have to be purchased by ODAV from ODOT to keep the Oregon Highway Trust whole, but it could be done.

If ODAV is interested in pursuing the conceptual idea, ODOT could begin a market analysis for the value of the land to be sold by ODOT to ODAV to get an idea of the current cost for this proposed idea.

Please add this to the list of things being considered as we prepare for the next PAC meeting.

Tony Helbling
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Canby, OR 97013
Cell: 503-519-6059
Office: 503-263-6882
helbling@wilsonconst.com
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Outlook

Fw: Master Plan Discussion

From Brandy Steffen <brandy.steffen@jla.us.com>
Date Tue 2024-10-22 10:04 AM
To Jen Winslow <Jen.winslow@jla.us.com>; Ashley Balsom <ashley.balsom@jla.us.com>

BRANDY STEFFEN | **JLA PUBLIC INVOLVEMENT**
Partner + Senior Program Manager
brandy.steffen@jla.us.com » Schedule a 30 minute meeting

From: BEACH Anthony <Anthony.BEACH@odav.oregon.gov>
Sent: Monday, October 21, 2024 3:46 PM
To: Samantha Peterson <SPeterson@CenturyWest.com>; Brandy Steffen <brandy.steffen@jla.us.com>
Cc: THOMAS Alex R <Alex.R.THOMAS@odav.oregon.gov>; W. Matt Rogers <WRogers@CenturyWest.com>
Subject: FW: Master Plan Discussion

Hi all, please include this in the record.

Thank you,

Tony Beach
OREGON DEPARTMENT OF AVIATION
STATE AIRPORTS MANAGER
OFFICE 503-378-2523 **CELL** 503-302-5455
M-F 7:30am – 4pm

From: BEACH Anthony
Sent: Monday, October 21, 2024 3:46 PM
To: Helbling, Tony <helbling@wilsonconst.com>; SUGAHARA Kenji <Kenji.SUGAHARA@odav.oregon.gov>
Cc: wk@klgpc.com; Ted Millar <tmillar@wwpmi.com>
Subject: RE: Master Plan Discussion

Hi Tony, hope you enjoyed the long weekend.

ODAV has made its decision on the Preferred Alternative with input from the PAC, which you were part of. We cannot make changes outside of that process. As mentioned earlier, we are accepting comments from the PAC through the 29th of October if you'd like to provide comments on the materials covered in the recent PAC meeting. In our December 10th PAC meeting, we will discuss noise, the Capital Improvement Plan, and Airport Layout Plan.

If you reconsider, Kenji and I are happy to meet to discuss how we can work together to ensure the Aurora State Airport can continue to serve the businesses at the airport.

Tony Beach
OREGON DEPARTMENT OF AVIATION
STATE AIRPORTS MANAGER
OFFICE 503-378-2523 **CELL** 503-302-5455
M-F 7:30am – 4pm

From: Helbling, Tony <helbling@wilsonconst.com>
Sent: Monday, October 21, 2024 10:43 AM
To: BEACH Anthony <Anthony.BEACH@odav.oregon.gov>; SUGAHARA Kenji <Kenji.SUGAHARA@odav.oregon.gov>
Cc: wk@klgpc.com; Ted Millar <tmillar@wwpmi.com>
Subject: RE: Master Plan Discussion

This message was sent from outside the organization. Treat attachments, links and requests with caution. Be conscious of the information you share if you respond.

Good Morning Tony and Kenji,

Was off Friday, now going thru emails – just saw this… very disappointed.

The whole purpose of the meeting would be to discuss the future of the airport – that would include the "preferred alternative" and its detrimental effect on so many business, jobs, communities, etc.…

We were hoping we could figure out how we could work collaboratively to toss around ideas and see if we identify a path forward together.

Sounds like the "preferred alternative" is a done deal.

There is no sense in us meeting tomorrow if this is your position.

Tony Helbling
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From: BEACH Anthony <Anthony.BEACH@odav.oregon.gov>
Sent: Thursday, October 17, 2024 3:55 PM
To: Helbling, Tony <helbling@wilsonconst.com>; SUGAHARA Kenji <Kenji.SUGAHARA@odav.oregon.gov>
Cc: wk@klgpc.com; Ted Millar <tmillar@wwpmi.com>
Subject: RE: Master Plan Discussion

Hi Tony, we don't have a PAC meeting on October 29th, we're accepting comments from the PAC through the 29th of October if you'd like to provide comments on the materials covered in the meeting.

We can meet for 1 hour Tuesday October 22nd at 10am at our office in Salem. We are not going to discuss changes to the Preferred Alternative.

Please let us know in advance if an attorney will be present as we will need ours. If ours is not available, we'll have to reschedule sometime in November or December.

Tony Beach
OREGON DEPARTMENT OF AVIATION
STATE AIRPORTS MANAGER
OFFICE 503-378-2523 **CELL** 503-302-5455
M-F 7:30am – 4pm

From: Helbling, Tony <helbling@wilsonconst.com>
Sent: Thursday, October 17, 2024 1:21 PM
To: BEACH Anthony <Anthony.BEACH@odav.oregon.gov>; SUGAHARA Kenji <Kenji.SUGAHARA@odav.oregon.gov>
Cc: wk@klgpc.com; Ted Millar <tmillar@wwpmi.com>
Subject: RE: Master Plan Discussion

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Tony,

Thank you for the clarification – this is great news! We're moving forward collaboratively!

We would like to take you up on the offer to "further discuss the feedback materials that were submitted and how we can work together to ensure the Aurora State Airport can continue to serve the businesses at the airport, as well as the community." Would like to do this prior to the next PAC meeting on October 29th.

When and where would you like to meet so we can start herding the cats! We could meet at our conference room in Hangar Juliet – plenty of room!

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From: BEACH Anthony <Anthony.BEACH@odav.oregon.gov>
Sent: Thursday, October 17, 2024 11:54 AM
To: Helbling, Tony <helbling@wilsonconst.com>; SUGAHARA Kenji <Kenji.SUGAHARA@odav.oregon.gov>
Cc: wk@klgpc.com; Ted Millar <tmillar@wwpmi.com>
Subject: RE: Master Plan Discussion

Both.

We are continuing with the next steps as presented on October 15th, and we can further discuss the feedback materials that were submitted and how we can work together to ensure the Aurora State Airport can continue to serve the businesses at the airport, as well as the community. I apologize for any confusion, I did not intend to suggest we would hold the master plan or change the preferred alternative outside of the PAC process.

As mentioned during the meeting, we'll be collecting comments from the PAC through the 29th of October if you'd like to provide comments on the materials covered in the meeting.

Tony Beach
OREGON DEPARTMENT OF AVIATION
STATE AIRPORTS MANAGER
OFFICE 503-378-2523 **CELL** 503-302-5455
M-F 7:30am – 4pm

From: Helbling, Tony <helbling@wilsonconst.com>
Sent: Thursday, October 17, 2024 11:10 AM
To: BEACH Anthony <Anthony.BEACH@odav.oregon.gov>; SUGAHARA Kenji <Kenji.SUGAHARA@odav.oregon.gov>
Cc: wk@klgpc.com; Ted Millar <tmillar@wwpmi.com>
Subject: FW: Master Plan Discussion

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Tony (and Kenji)

Again – thanks for the call back.

Just asking for clarification on the note below – are you saying we are going to hold for a second and set up a meeting so **"We can further discuss the feedback materials and how we can work together to ensure the Aurora State Airport can continue to serve the businesses at the airport, as well as the community."**?

Or is ODAV going to proceed as per the "next steps" slide presented October 15th to the PAC?

Please clarify.

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From: BEACH Anthony <Anthony.BEACH@odav.oregon.gov>
Sent: Thursday, October 17, 2024 9:32 AM
To: Helbling, Tony <helbling@wilsonconst.com>
Cc: SUGAHARA Kenji <Kenji.SUGAHARA@odav.oregon.gov>
Subject: Master Plan Discussion

Hi Tony,

Thanks for chatting with Kenji and me on the recent master plan meeting. We understand your concerns and frustrations, and we appreciate you talking through those with us. We also understand you would like an opportunity to meet and discuss the materials that were provided to us as part of the PAC feedback process. Finally, we understand your desire for a safe, realistic, and less impactful path forward for the Aurora State Airport. We believe our alternatives met those criteria, and we selected the alternative that best reflects the feedback we received from the PAC.

We can further discuss the feedback materials and how we can work together to ensure the Aurora State Airport can continue to serve the businesses at the airport, as well as the community.

Thanks again, this email will be sent to the planning team to be included in the public record.

Tony Beach
OREGON DEPARTMENT OF AVIATION
STATE AIRPORTS MANAGER
OFFICE 503-378-2523 **CELL** 503-302-5455
M-F 7:30am – 4pm

Outlook

Fw: Aurora Preferred Alternative

From Brandy Steffen <brandy.steffen@jla.us.com>
Date Mon 2024-11-04 4:17 PM
To Jen Winslow <Jen.winslow@jla.us.com>; Ashley Balsom <ashley.balsom@jla.us.com>

BRANDY STEFFEN | **JLA PUBLIC INVOLVEMENT**
Partner + Senior Program Manager
brandy.steffen@jla.us.com » Schedule a 30 minute meeting

From: BEACH Anthony <Anthony.BEACH@odav.oregon.gov>
Sent: Monday, November 4, 2024 4:03 PM
To: Samantha Peterson <SPeterson@CenturyWest.com>; Brandy Steffen <brandy.steffen@jla.us.com>
Cc: THOMAS Alex R <Alex.R.THOMAS@odav.oregon.gov>
Subject: FW: Aurora Preferred Alternative

Good afternoon, please include this in the public record for the UAO master plan.

Thank you,

Tony Beach
OREGON DEPARTMENT OF AVIATION
STATE AIRPORTS MANAGER
OFFICE 503-378-2523 **CELL** 503-302-5455
M-F 7:30am – 4pm

From: Sarah Lucas <sarahlucas1982@gmail.com>
Sent: Monday, November 4, 2024 3:49 PM
To: Helbling, Tony <helbling@wilsonconst.com>
Subject: Re: Aurora Preferred Alternative

This message was sent from outside the organization. Treat attachments, links and requests with caution. Be conscious of the information you share if you respond.

Tony,

Thank you for your patience with my reply. I have been traveling for work the last couple of weeks and am trying to process the situation at UAO.

The alternatives, proposed or preferred, are not ideal - given FAA will not issue any Mods. On that subject, I have asked ODAV to provide a statement from the FAA, as I have not seen FAA's position in writing. Without Mods, it seems they will not accept any alternative that partially addresses the issues - it's all in or nothing. Hopefully a letter will clarify that understanding. As a member of the PAC, did you, or any of the other businesses, voice support of any alternative presented?

I am emphatic to the issue, and I do appreciate the interest, but given my current workload I cannot take on any additional roles. On top of that, I'm not sure state ethics would allow my participation in any process while on the Board.

-Sarah

On Oct 25, 2024, at 4:23 PM, Helbling, Tony <helbling@wilsonconst.com> wrote:

Good afternoon…

Had dinner with Senator Betsy Johnson last night – wow – she's not a fan of ODAV staff right now! But, she's not in office and knows she really holds no sway with them anymore.

If you are interested, would like to get on the phone next week and talk about how this is going… not good. It seems to the front row hangar owners this is being ram rodded and the decision has already been made. The staff and consultant are only going thru the motions so they can check the blocks on the FAA grant form.

Thing is, this is going to create a very bad situation for everyone, and I don't think the staff, the consultant, or the FAA remotely care about the damage that looms on the horizon.

I doubt you could, due to conflict of interests, but would you be interested/willing to work as a professional consultant for the owners group that is planning to push back against this madness?

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Outlook

Fw: questions

From Brandy Steffen <brandy.steffen@jla.us.com>
Date Fri 2024-11-01 4:50 PM
To Jen Winslow <Jen.winslow@jla.us.com>; Ashley Balsom <ashley.balsom@jla.us.com>

BRANDY STEFFEN | **JLA PUBLIC INVOLVEMENT**
Partner + Senior Program Manager
brandy.steffen@jla.us.com » Schedule a 30 minute meeting

From: Helbling, Tony <helbling@wilsonconst.com>
Sent: Wednesday, October 30, 2024 4:37 PM
To: BEACH Anthony <Anthony.BEACH@odav.oregon.gov>; Brandy Steffen <brandy.steffen@jla.us.com>
Cc: Bruce Bennett <bruce@auroraaviation.com>; Ted Millar <tmillar@wwpmi.com> <tmillar@wwpmi.com>; wk@klgpc.com <wk@klgpc.com>
Subject: RE: questions

Thanks for the follow up note - Understand – please enter these thoughts into the record…

Its hard for me as a PAC member to support or validate ODAV's preferred alternative including an Vehicle Service Road (VSR) when there is no explanation of definition of an allowed "Vehicle". This essentially gives ODAV the ability to define "Vehicle" anyway it wants **after** the adoption of the MP/ALP – a blank check if you will.

The 2012 ALP approved by the FAA showed an Internal Circulation Road (ICR) with the identified purpose of circulating traffic within the airport such that private vehicles could be included to **support commerce** and allow movement inside the airport without having to go out onto Airport Rd – a 55 mph hightway… i.e., private vehicles, Amazon vans, bikes, pedestrians, tugs, fuel trucks, etc… a SLOW route for the movement of goods and people inside the airport… very valuable for the spirit of the through the fence business development as called out in the ORS. Most of the ICR was purposefully designated in/thru areas **well back from the ramp** with to goal of reducing the probability of a VPD.

We fear the VSR would be substantially different (and can not assume otherwise) in that it is between the ramp and active taxiway(s), making it an unlikely place for private vehicles, bicycles or pedestrians, especially in light of the note included drivers would have to complete ODAV training for driving beyond the movement line… which counts out the amazon drivers, etc…

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From: BEACH Anthony <Anthony.BEACH@odav.oregon.gov>
Sent: Wednesday, October 30, 2024 4:19 PM
To: Helbling, Tony <helbling@wilsonconst.com>; Brandy Steffen <brandy.steffen@jla.us.com>
Subject: RE: questions

Hi Tony, the requirements are not currently defined.

Tony Beach

OREGON DEPARTMENT OF AVIATION
STATE AIRPORTS MANAGER
OFFICE 503-378-2523 **CELL** 503-302-5455
M-F 7:30am – 4pm

From: Helbling, Tony <helbling@wilsonconst.com>
Sent: Monday, October 28, 2024 3:17 PM
To: BEACH Anthony <Anthony.BEACH@odav.oregon.gov>; Brandy Steffen <brandy.steffen@jla.us.com>
Subject: RE: questions

This message was sent from outside the organization. Treat attachments, links and requests with caution. Be conscious of the information you share if you respond.

Please define requirements to be granted "privileges to access inside the Fence/Aircraft Operations Area" in addition to the driver training.

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From: BEACH Anthony <Anthony.BEACH@odav.oregon.gov>
Sent: Monday, October 28, 2024 3:10 PM
To: Helbling, Tony <helbling@wilsonconst.com>; Brandy Steffen <brandy.steffen@jla.us.com>
Subject: RE: questions

Hi Tony,

A Vehicle Service Road (VSR) is defined by the FAA as "a designated roadway for vehicles in a non-movement area." The VSR would be for the use of vehicles by individuals that have privileges to access inside the Fence/Aircraft Operations Area at UAO, and have received ODAV's Non-Movement Area Driver's Training.

Tony Beach

OREGON DEPARTMENT OF AVIATION
STATE AIRPORTS MANAGER
OFFICE 503-378-2523 **CELL** 503-302-5455
M-F 7:30am – 4pm

From: Helbling, Tony <helbling@wilsonconst.com>
Sent: Monday, October 28, 2024 10:51 AM
To: Brandy Steffen <brandy.steffen@jla.us.com>; BEACH Anthony <Anthony.BEACH@odav.oregon.gov>
Subject: questions

This message was sent from outside the organization. Treat attachments, links and requests with caution. Be conscious of the information you share if you respond.

I'm working on my feedback as a PAC member to send back tomorrow…

Question – the preferred alternative shows a "Vehicle Service Road – VSR"… who will be allowed to use this road? Will only be tugs, fuel trucks, ODAV vehicles, FAA vehicles?

Or – will (i.e.) Tony Helbling's personal car be able to use the road (after state trailing) to move up and down the airport? Will bicycles or walkers be allowed on this road?

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Outlook

Fw: Feedback to Preferred Alternative Rev 0.docx

From Brandy Steffen <brandy.steffen@jla.us.com>
Date Fri 11/1/2024 4:49 PM
To Jen Winslow <Jen.winslow@jla.us.com>; Ashley Balsom <ashley.balsom@jla.us.com>

BRANDY STEFFEN | **JLA PUBLIC INVOLVEMENT**
Partner + Senior Program Manager
brandy.steffen@jla.us.com » Schedule a 30 minute meeting

From: BEACH Anthony <Anthony.BEACH@odav.oregon.gov>
Sent: Wednesday, October 30, 2024 4:14 PM
To: Helbling, Tony <helbling@wilsonconst.com>; Brandy Steffen <brandy.steffen@jla.us.com>
Cc: Ted Millar <tmillar@wwpmi.com> <tmillar@wwpmi.com>; wk@klgpc.com <wk@klgpc.com>; Bruce Bennett <bruce@auroraaviation.com>
Subject: RE: Feedback to Preferred Alternative Rev 0.docx

Hi Tony, confirming receipt, and we'll have our comments and PAC meeting summary posted on the project website shortly.

Thank you!

Tony Beach
OREGON DEPARTMENT OF AVIATION
STATE AIRPORTS MANAGER
OFFICE 503-378-2523 **CELL** 503-302-5455
M-F 7:30am – 4pm

From: Helbling, Tony <helbling@wilsonconst.com>
Sent: Tuesday, October 29, 2024 2:55 PM
To: Brandy Steffen <brandy.steffen@jla.us.com>; BEACH Anthony <Anthony.BEACH@odav.oregon.gov>
Cc: Ted Millar <tmillar@wwpmi.com> <tmillar@wwpmi.com>; wk@klgpc.com; Bruce Bennett <bruce@auroraaviation.com>
Subject: Feedback to Preferred Alternative Rev 0.docx

This message was sent from outside the organization. Treat attachments, links and requests with caution. Be conscious of the information you share if you respond.

Please see attached.

Tony Helbling

October 29, 2024

To: Oregon Department of Aviation (ODAV)

FROM: Tony Helbling - PAC Member
Ted Millar - PAC Member
Aurora Airport Improvement Association

RE: Feedback to Preferred Alternative - Aurora Airport Master Plan

Per the invitation at the October 15, 2024, PAC meeting, this comment is submitted by Airport Stakeholders who are PAC members as well as is submitted by the entirety of the Aurora Airport Improvement Association (AAIA). AAIA is the organization of the private airport stakeholders including but not limited to:

- Atlantic Aviation
- TLM Holdings
- Wilson Construction Company
- Kory McGregor
- Blue Skies Aviation
- Tim Warren
- George VanHoomison
- Helicopter Transport Services

This is the Airport Stakeholders feedback to ODAV/Century West on "Preferred Alternative" presented during the October 15, 2024, PAC Meeting.

1. ODAV's preferred alternative needlessly punts indefinitely the desperately needed runway extension, inexplicably relocates the internal access road from where it is already partly constructed (wasting the investment in the existing internal road infrastructure) and where it was approved in the 2012 master plan to a location that dangerously parallels an active taxiway, destroys the septic drainfields necessary for the $300 million in private investment at the airport to continue to support the airport's 1,500 jobs, unnecessarily takes critically needed airplane parking, unnecessarily takes property from people on both sides of the airport, while wholly neglecting ODAVs duty as steward of the airport to keep it safe and nurture the economic engine that the legislature directed ODAV support. ODAV's preferred alternative is contrary to law and ODAV's responsibilities. ODAV's claim "the airport MUST be brought into standards as per the FAA" is simply wrong. We have explained in detail that FAA must and will consider a MOS to enable the runway extension (which will be temporary until ODAV moves Highway 551 thirty feet west in the existing ODOT right-of-way). During the last PAC meeting FAA did not claim otherwise. Rather,

the FAA representative specifically stated the FAA is not directing ODAV what to write and that the agency simply wanted a pathway to design standard compliance. Those words mean FAA will (as it must) allow the runway to be extended so long as the master plan contemplates moving Highway 551 when funding becomes available to do so.

2. The preferred alternative is a nonstarter for the following reasons.

    a. The acquisition of the properties is unfair in that

        i. Acquisition is apparently planned to violate the law. Instead of paying fair market value as the law requires, David Miller, the lead consultant during the PAC meeting – explained rates to be paid for the properties will not be the fair market values, the paid rates will be the tax roll valuations. (Which is a significantly lower price.) Even though this is unlawful, the statement of intention to acquire private property at unlawful law ball prices sets up the area for precondemnation blight.
        ii. ODAV (Tony Beach) stated in a direct conversation that it will not pay for relocation costs for affected properties.
        iii. ODAV will also not pay for business disruption costs. If the alternative proceeds the airport and affected privately owned areas will be blighted.

    b. ODAV is completely failing

        i. To defend investment as called for in ORS 836.642, (3), (e), "Preserve investments in pilot sites…"
        ii. To recognize that more than half of the entire airport is made up of privately owned property, upon which private investment provides nearly 1500 family wage paying jobs. A significant portion of which could be lost if the preferred alternative is adopted.

    c. The "Vehicle Service Road" (VSR) is poorly thought out, damaging and unnecessary.

        i. Previous Master Plan updates to include the 2012 ALP approved by the FAA, showed and Internal Circulation Road (ICR) the underlying land for which is largely currently available at no cost to ODAV now and is partially constructed per the 2012 master plan. The ICR was designed for fuel trucks, tugs, official agency vehicles, private vehicles, and 3rd party vendor delivery vehicles. Most of the ICR was set back from the ramp and the taxiway, reducing the probability of a Vehicle Pedestrian Deviation (VPD) or a collision event.

ii. The VSR anomalously parallels the active taxiway, and the preferred alternative omits the ICR that works and that had previously been planned to be improved to work even better to serve the private investment at the airport. Without an answer to the question put to ODAV, "Who will be allowed to operate a vehicle on the VSR?", it appears that ODAV will only allow fuel trucks, tugs, ODAV and FAA vehicles on the VSR, again seeming to turn a blind eye to the needs of the private aeronautics' investors at the airport and the 1500 family wage jobs they created and, until now at least, have maintained. And its responsibilities assigned by the legislature under ORS 836.640-642,

d. Neither ODAV (nor the FAA) have identified any funding source to pay for anything in the preferred alternative, essentially making this Masterplan and its subsequent Airport Layout Plan completely unachievable, ultimately useless and a colossal waste of taxpayer money. ODAV has failed to discharge its responsibility to establish a meaningful and achievable master plan outlined in a of number federal rules to include:

i. AC 150/5070-6B, Part I, Chapter 1, 101. - "The technical steps described in this AC are generally applicable, although each step should be undertaken only to the extent necessary to produce a **MEANINGFUL** (emphasis added) product for a specific airport."
ii. AC 150/5070-6B, Part I, Chapter 1, 104., b. – "The FAA strongly encourages that planners consider the possible environmental and **SOCIOECONOMIC** costs associated with alternative development concepts, and the possible means of **AVOIDING, MINIMIZING OR MITIGATING IMPACTS** to sensitive resources at the appropriate level of detail for facilities planning."
iii. AC 150/5070-6B, Part I, Chapter 1, 104., c. 5) – "Propose an **ACHIEVABLE** financial plan to support the implementation schedule."

3. It is also frustrating that a group of airport stakeholders asked to have a meeting with ODAV and its consultants to discuss an alternative the stakeholders presented on the record that is wholly consistent with the 2012 master plan, constructs in the short term the runway extended on an approvable MOS, and includes a plan to move Highway 551 west the magic 30 feet in the existing right-of-way, when funding is available to do so. It also maintains the existing drainfields merely requiring that they be brought to compliance with FAA standards as demonstrated is wholly achievable by an uncontroverted geotechnical report in the record.[1] ODAV has made it clear that it has no

[1] ODAV asserted with no evidence, that is zero support that compliance was infeasible. Reliance upon that and other unsupported assertions are disappointingly ODAV's theme in this master plan effort.

interest in the airport stakeholders' meaningful, achievable and much less expensive master plan alternative. Rather:

a. The Airport Stakeholders were told by the Director of ODAV that ODAV would not meet to discuss it outside of a PAC meeting and explained that any discussions of ideas would only happen during, and in full view of the public, a live PAC meeting.
b. As directed by ODAV's director, the Airport Stakeholders waited for the October 15, 2024, meeting to discuss the stakeholders master plan alternative (presented on September 3, 2024, and ignored to date).
c. We asked during that PAC meeting to discuss our proposal and were then told by ODAV's Tony Beach that the proposal had been dismissed by ODAV and the consultant for no reason other than the unsupported conclusion that it was "not possible". And any consideration or discussion of the Stakeholders' alternative was completely foreclosed in the PAC meeting forum.
d. ODAV and the consultants presented the ODAV preferred alternative and next steps to the PAC with no PAC discussion of the stakeholders' alternative. This appears to the PAC, that its input is unwelcome and the entire process pro forma. The only conclusion is that ODAV's decision was already made, and that stakeholder input has been and was always intended to be window-dressing, nothing more.
e. After the PAC Meeting, the airport stakeholders expressed frustration with not being allowed to discuss the proposed stakeholder alternative during the PAC meeting. ODAV merely gave a giant bureaucratic shrug.

4. Anyone can see this Master Plan effort is a sham, has a pre-determined outcome, and public or PAC member input is viewed as a nuisance level necessity

a. It is apparent ODAV, the consultants have decided how the final master plan shall be completed – the preferred alternative is not about airport safety, airport efficiency, aeronautical advancement for the future, economic development, family wage jobs, but about destroying the through the fence operations at the airport. But ODAV must understand, they are in that single minded focus destroying the Goose that laid the golden economic development egg that until now has been the Aurora Airport and importantly they are violating the legislative command of ORS 836.640-642.
b. ODAV's tone deafness to input and the law rests on false assumptions that the FAA can and does demand perfect airport design standard compliance before the runway may be extended, even though it is clearly a real safety issue to ignore the needed runway extension, and the safety risk of imperfect design compliance is almost infinitely minute:

i. The landing risk is “one incident in every 16.7 trillion landings, the time between occurrences is calculated as 16 trillion landings divided by 45,115 landing operations per year which equates to one incident every 369,000 years.”
ii. The landing roll risk is “one incident in every 12.5 million landings, the rate of occurrence is calculated as 12.5 million landings divided by 45,115 landings per year which equates to one incident every 277 years” at worst or more likely “one incident in every 16.7 million landings, the rate of occurrence is calculated as 16.7 million landings divided by 45,115 landings per year which equates to one incident every 369 years.”
iii. The takeoff roll phase, the risk is “one incident in every 45.5 million takeoffs, the rate of occurrence is calculated as 45.5 million takeoffs divided by 45,115 takeoffs per year which equates to one incident every 1,008 years.”
iv. The landing roll phase risk to taxiway is “one incident in every 11.1 million landings, the rate of occurrence is calculated as 11.1 million landings divided by 45,115 landings per year which equates to one incident every 246 years.”

5. You are no doubt aware that FAA is required to consider and approve a MOS “when necessary to meet local conditions” so long as the “modification will provide an acceptable level of safety, economy, durability and workmanship.” (*See,* 14 CFR § 152.11(b)).

    a. That has been proven by the Airport Stakeholders alternative that ODAV is ignoring.
    b. The design standards for which ODAV claims FAA demands perfect prerequisite compliance for any runway extension applies to all airports in the US. The FAA routinely approves MOS for large airports nationwide some with genuine safety concerns. Nothing suggests Aurora has some super anomaly warranting the disparate treatment ODAV claims FAA demands. Rather, as shown above, the risk of 30 feet of imperfection until funding is available to move Highway 551 is ridiculously small.

6. ODAV’s decisions were made before presenting information to the PAC, specifically evident in the facts surrounding the previous two PAC meetings.
    a. Refined Alterantives 1A, 1B and 2 were NOT allowed to be seen by PAC members or the public for meaningful review BEFORE the July 31, 2024, PAC meeting.
    b. The Preferred Alternative was not allowed to be seen by the PAC members or the public for meaningful review BEFORE the October 15, 2024, PAC meeting.

7. ODAV has lost its way. ODAV should pause the process and park the preferred alternative until such time that:

    a. ODAV and consultants set up an in-person work session for the ENTIRE PAC where proposals that bring a win-win situation for everyone could be JOINTLY developed.
    b. ODAV works collaboratively with the FAA, and the PAC to define a path forward that provides as safe airport, respectful of surrounding communities, protects the investment in private property both on and off the airport, and follows the law to include ORS 836.640-642.

Sincerely,

Tony Helbling - PAC Member
Ted Millar - PAC Member
Aurora Airport Improvement Association

Outlook

Fw: PAC

From Brandy Steffen <brandy.steffen@jla.us.com>
Date Tue 12/10/2024 6:27 PM
To Jen Winslow <Jen.winslow@jla.us.com>; Ashley Balsom <ashley.balsom@jla.us.com>

BRANDY STEFFEN | **JLA PUBLIC INVOLVEMENT**
Partner + Senior Program Manager
brandy.steffen@jla.us.com » Schedule a 30 minute meeting

From: BEACH Anthony <Anthony.BEACH@odav.oregon.gov>
Sent: Tuesday, December 10, 2024 3:47 PM
To: David Waggoner <willametteaviation@icloud.com>; Tony Helbling <helbling@wilsonconst.com>
Cc: Dave Waggoner <dave@WillametteAir.com>; Betsy Johnson <betsy@betsyjohnson.com>; SUGAHARA Kenji <Kenji.SUGAHARA@odav.oregon.gov>; Samantha Peterson <SPeterson@CenturyWest.com>; Brandy Steffen <brandy.steffen@jla.us.com>; THOMAS Alex R <Alex.R.THOMAS@odav.oregon.gov>
Subject: RE: PAC

Hi all,

I am sorry but we can't make last minute changes to the PAC. As you know, there is a lot of interest from airport users and local communities in representing a wide range of organizations for the UAO master plan. Our PAC is already significantly larger than used for most master plans, and our goal is to be as fair and transparent as possible. Most importantly, we value the feedback from the members of the organizations that we have requested representation on the PAC for this master plan.

The process in which we conduct the master plan for UAO is very important. For 3 years since this process started we have made sure that all PAC members had equal opportunities for engagement. This includes, for public benefit, transparency in who represents organizations and communities throughout this process. The PAC list is published on the project website.

The public will have ample opportunities to provide comments in the meeting as long as time allows. If there is not enough time, the public can submit written comments that will be considered by the planning team and included in the public record for this master plan.

Thank you for your understanding,

Tony Beach
OREGON DEPARTMENT OF AVIATION
STATE AIRPORTS MANAGER
OFFICE 503-378-2523 **CELL** 503-302-5455
M-F 7:30am – 4pm

From: David Waggoner <willametteaviation@icloud.com>
Sent: Tuesday, December 10, 2024 3:40 PM
To: Tony Helbling <helbling@wilsonconst.com>
Cc: Dave Waggoner <dave@WillametteAir.com>; Betsy Johnson <betsy@betsyjohnson.com>; SUGAHARA Kenji <Kenji.SUGAHARA@odav.oregon.gov>; Samantha Peterson <speterson@centurywest.com>; BEACH Anthony <Anthony.BEACH@odav.oregon.gov>; Brandy Steffen <brandy.steffen@jla.us.com>
Subject: Re: PAC

This message was sent from outside the organization. Treat attachments, links and requests with caution. Be conscious of the information you share if you respond.

Master Planning Committee,

I would like to appoint Betsy Johnson as my alternate for the PAC meeting this evening.

Please confirm receipt of this email and the appointment has been made.

I also want to register my concern on how the current Preferred Alternate would effect the emergency services provided from our property on the Airport and the devastating impact on our airport neighbors.

The Preferred Alternate would displace many of the airport neighbors living to the west of the Hubbard Hwy. Many of the residents are retired and living on a fixed income. In a time where there is a housing shortage, forcing the residents out of their homes would a horrendous burden.

The Civil Air Patrol (CAP) and the Disaster Airlift Response Team (DART) both have facilities on our property to support of Oregonians during and after an emergency.

We provide, at no cost, a facility where the CAP has established a permanent Emergency Operations Center (EOC). The CAP has installed communications equipment to coordinate their efforts with State and Federal agencies in responding to disasters. It is a communications hub for Oregon and Southwest Washington.

The EOC also is the home for a CAP Cadet program. CAP's cadet program is designed to inspire the country's youth to become leaders and good American citizens through their interest in aerospace and service to the country. Cadets work their way through a series of achievements by completing studies and other activities. Some of the achievements include aerospace education, moral leadership, physical fitness, drill and ceremonies, leadership, and other special activities.

The EOC is also used as a staging area for Oregon DART. This distribution hub is used to store and transport emergency supplies, medical equipment and responders from Aurora to outlying communities impacted by fire, floods and other natural disasters.

If the current Preferred Alternate is adopted, the EOC building would be demolished, forcing the EOC to be closed. This would significantly Oregon's emergency

preparedness response.

Thank you for your consideration,

David Waggoner

Willamette Aviation Service
23115 Airport Rd NE
Aurora OR 97002

Direct: 503-680-3597
Office: 503-678-2252
dave@willametteair.com

On Dec 10, 2024, at 1:50 PM, Helbling, Tony <helbling@wilsonconst.com> wrote:

Dave,

Please see thread below. We're going to need you to set up Betsy Johnson as your alternate for tonight's PAC meeting. Otherwise, she can only speak for 2 min during public testimony.

Durning the public input segment, you will still be able to share your direct concern about your property being taken and it's effect on emergency aero services associated with Willamette Aviation's property – detrimental effect on disaster response – but may be limited to two minutes.

Thanks for doing this…

Tony Helbling
Logistics Manager
Wilson Construction Company
1190 NW 3rd Ave
Canby, OR 97013
Cell: 503-519-6059
Office: 503-263-6882
helbling@wilsonconst.com
www.wilsonconst.com

From: SUGAHARA Kenji <Kenji.SUGAHARA@odav.oregon.gov>
Sent: Tuesday, December 10, 2024 11:24 AM
To: Helbling, Tony <helbling@wilsonconst.com>; Samantha Peterson <speterson@centurywest.com>; BEACH Anthony <Anthony.BEACH@odav.oregon.gov>
Subject: Re: PAC

Sorry man, it has to be during public comment. That would open the door to litigation.

From: Helbling, Tony <helbling@wilsonconst.com>
Sent: Tuesday, December 10, 2024 10:03:40 AM
To: SUGAHARA Kenji <Kenji.SUGAHARA@odav.oregon.gov>
Subject: PAC

This message was sent from outside the organization. Treat attachments, links and requests with caution. Be conscious of the information you share if you respond.

Would you allow Betsy Johnson to participate during the PAC portion of tonight's meeting or will you require her to only speak during the public testimony portion?

Please let me know ASAP.
Tony Helbling
Logistics Manager
Wilson Construction Co.

Sent from my iPhone: (503) 519-6059

Outlook

Fw: OAB packet enter into tonight's record

From Brandy Steffen <brandy.steffen@jla.us.com>
Date Tue 12/10/2024 2:31 PM
To Jen Winslow <Jen.winslow@jla.us.com>; Ashley Balsom <ashley.balsom@jla.us.com>

5 attachments (6 MB)

Aurora Airport Situation Brief v5.docx; aurora-amp-preferred-alternative-summary-10.15.24.pdf; ORS 836.642 - Program for through the fence operations.pdf; UAO airport risk analysis for ROFA mod of standards - 2024-8-29 Final.pdf; LTR DIRECTOR GARRISON.pdf;

BRANDY STEFFEN | **JLA PUBLIC INVOLVEMENT**
Partner + Senior Program Manager
brandy.steffen@jla.us.com » Schedule a 30 minute meeting

From: Helbling, Tony <helbling@wilsonconst.com>
Sent: Tuesday, December 10, 2024 1:54 PM
To: BEACH Anthony <Anthony.BEACH@odav.oregon.gov>; Brandy Steffen <brandy.steffen@jla.us.com>
Cc: jamiestickel@yahoo.com <jamiestickel@yahoo.com>; wk@klgpc.com <wk@klgpc.com>; warrenjt@proton.me <warrenjt@proton.me>; Betsy Johnson <betsy@betsyjohnson.com>
Subject: OAB packet enter into tonight's record

Tony and Brandy,

Please enter attached packet delivered to the OAB 12/5/24 into tonight's record. We will be referencing it during the round table discussion.

Please acknowledge receipt.

Tony Helbling
Logistics Manager
Wilson Construction Company
1190 NW 3rd Ave
Canby, OR 97013
Cell: 503-519-6059
Office: 503-263-6882
helbling@wilsonconst.com
www.wilsonconst.com

Overview

1. In 2007, SB680 was approved by the Oregon State Legislature and became ORS 864-642. It clearly stated Aurora State Airport (KUAO) as well as five other rural airport are to participate in the effort. The spirit of the legislation called for government agencies to look outside of the box to allow surrounding communities to provide sewer, water, fire & police protection without having to annex into those cities.
    a. In reliance ORS 864-642, according to the Marion County tax records, over $250 Million dollars' worth of buildings have been built at KUAO by private enterprise.
    b. KUAO pays over $1,750,000 in property taxes into the General Fund supporting schools, libraries, over 1/3 of the Aurora Fire district budget etc. according to the Marion County tax records.
    c. According to ODAV's "Oregon Aviation Plan", the multiplier effect to the surrounding cities and communities is approximately $2.50 Billion per year.
    d. KUAO now has over 1500 living wage jobs in addition to supporting most of the major employer businesses in Clackamas & Marion Counties.
2. The FAA designated KUAO to be one of 83 non-commercial service airports in the nation that has Major Significance to the National Transportation System.
    a. KUAO is the airport base for numerous companies that provide emergency services, firefighting, police & drug enforcement etc. such as Life Flight, Columbia Helicopters, Helicopter Transport, Wilson Construction, Winco Power Line Services, Clackamas County Sherrif's Dept., Portland Police, FBI, Civil Air Patrol, Angel Flight and many more.
    b. KUAO is further recognized as important in the State's Emergency Management Plan in the event of a major disaster.
3. The 2012 Airport Master Plan Update (2021 MPU) was approved by the Oregon Department of Aviation and by the FAA in 2012. It was law & not challengeable.
4. The Control Tower was approved & constructed in 2014 based on the 2012 MPU. It was successfully built with full Non-Partisan support by Governor Kitzhaber, Senator Wyden, Senator Merkley, Senator Bob Smith, Senator Schrader and others.
5. Former ODAV Director, Betty Stansbury decided to have the 2012 MPU re-approved. The airport users begged her not to do so as it would open the new approval to legal challenges, but she did it anyway, triggering several costly major lawsuits to the State of Oregon because of Betty Stansbury's action.
6. The airport opposition groups with the assistance of City of Wilsonville, & City of Aurora nearly immediately filed an appeal of the 2012 MPU re-approval.
7. ODAV's State Airports Manager, Tony Beach (Betty Stansbury's protégé) is now continuing to NOT support the safety & economic viability of the airport with the development of a completely new "preferred alternative" in the master plan proposal (Exhibit 1), in such a manner, airport users are severely limited in their ability to participate in the discussion. Some members of the Public Advisory Committee (PAC) were disallowed to speak about their proposed solution after being told, the only time they would be allowed to speak was during a PAC meeting for the new Master Plan development.
8. Major employers at the Airport have been strong participants as part of the "Advanced Manufacturing Industry Cluster – Aviation" called out in the Oregon Business Plan. Their work efforts are actively coordinated with Business Oregon.

9. Nearly all these businesses have branch offices in Idaho, Nevada & Washington and if ODAV kills their opportunities to expand & operate safely at KUAO, surrounding states would be happy to offer them tax & incentive subsidies to move to these states. We should not let that happen!!!
10. **ODAV (Betty Stansbury and Tony Beach) Caused this Problem!! ODAV (Now Director Kenji Sugahara and Tony Beach) needs to correct it!! Not Make it Worse!!**

December 5, 2024

A brief prepared by

Aurora Airport Improvement Association

for

Oregon Aviation Board

The Great State of Oregon

"Oregon Department of Aviation's Aurora State Airport Master Plan Preferred Alternative includes an unacceptable phasing program that withholds the urgently needed runway extension while destroying the drain-fields necessary to serve the septic needs of over $250 million in private aeronautic investment. This alternative makes the airport less safe and needlessly diminishes significant private investment that created nearly 1500 jobs. These were investments at the Aurora Airport made in good faith pursuant to State of Oregon legislation."

Aurora State Airport is located at the north end of Marion County, between the towns of Aurora and Wilsonville, parallel to State Highway 551. Adjacent to the airport is private property established as "through the fence" operations per ORS 836.640 and ORS 836.642. Pursuant to the promise of those state statutes, significant private monies have been invested into national and international aviation businesses situated at the airport. These businesses are responsible for nearly 1,500 family-wage paying jobs. The economic impact of the airport is measured at over a half billion dollars annually by the Oregon Aviation Plan Airport Summary, published by the Oregon Department of Aviation (ODAV) several years ago. The airport's economic impact is even greater now.

The Federal Aviation Administration (FAA) provides funding to airports that have formalized plans for future improvements and safety upgrades. These plans look ahead 20 years based on current operations and future forecasts. The formal term for these plans is an airport "Master Plan" (MP), part of which is the future "Airport Layout Plan" (ALP). Typically, these plans are "Updated" (Plan Updates or MPUs) every 10 years. The MP and Plan Updates to include the ALP are approved by the FAA and are the roadmaps to where and how airports develop adequately and safely over the planning horizon. ODAV is creating a new MP in lieu of conducting update to the MP they already have for the airport.

THE NEEDED RUNWAY EXTENSION WAS ALWAYS A PART OF AURORA AIRPORT MASTER PLANS. IT CANNOT BE ABANDONED NOW WHEN THE NEED IS MOST URGENT

The first MP was approved in 1976, showing the airport was determined to be of substantial value to the State's and the region's transportation and economic infrastructure. The 1976 MP called for a 6,000 linear foot runway and a tower to control air traffic. Subsequent MPUs and ALPs all called for a 6,000 linear foot runway and tower. The runway is now 5,003 linear feet, still nearly 1,000 feet too short for the aircraft that now use the airport.[1] The tower was recently completed in 2014. But the runway extension languishes.[2] As the airport and private properties have developed over the years in accordance with FAA standards and ORS 836.642 "Program for through the fence operations", private industry has invested heavily and worked closely, or at least have attempted to do so, with ODAV.

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[1] This is not about making the runway longer to attract new aircraft. This is exclusively about making the runway long enough to safely handle the aircraft that already use the airport. This fact is not disputed but is often lost in the din.

[2] ODAV's prior director unwisely and inexplicably allowed airport opponents to challenge the 2012 mast plan some eight (8) years after it was finally approved by both the state and the FAA and after significant public and private investments were made on the strength of it. City of Aurora and other perennial airport opponents took full advantage of that opportunity and objected to pretty much everything about the master plan to include the planned 1,000 linear foot runway extension to the south citing that some of that land was zoned "EFU." The court remanded, but to the great frustration of the aviation stakeholders, ODAV refused to respond to that remand, preferring to start over.

ODAV FALSE CLAIMS DRIVING UNACCEPTABLE AIRPORT DEVELOPMENT FOR NEXT 20 YEARS

ODAV is now claiming that the FAA will not allow the runway to be lengthened unless and until the distance between the runway and Highway 551 is increased by 32 feet, a herculean, hundred-plus millions of dollars, task.[3] ODAV makes this claim even though aviation crews and passenger safety has demanded that the runway be lengthened for more than 10 years, and its lengthening was approved in the 2012 MP and its ALP. ODAV blames the FAA, asserting that the FAA now refuses to accept any "Modifications of Standard" for certain airport features that do not perfectly comply with FAA design standards and the FAA is saying Aurora must be brought into perfect compliance with said standards right now or the FAA will put the airport into a "maintenance only," mode, whatever that means. What this means is that unless the state and federal government come up with the $100+ million to move Hwy 551 (money that no one claims exists), the runway is condemned to be substandard for the aircraft that use it for the foreseeable future – an unacceptable result. But ODAV's premise is wrong and ignores what the FAA actually requires – the FAA requires no immediate compliance with every design standard – but rather current assurances of safety for existing conditions and a pathway to eventual compliance to be achieved when it is feasible. As you will see from attached Exhibit 2, Letter to FAA Regional Director Garrison, the situation is so untenable that the aviation stakeholders have asked FAA to clarify that ODAV has misinterpreted FAA's requirements.

The truth is that FAA **routinely** approves such Modifications of Standards for existing conditions that cannot practically be changed (like moving highways) for airports all over the United States, on findings that the airport will be safe regardless of a lack of perfect compliance. Here, as you can see from the attached risk report (Exhibit 3), FAA's safety standard is met (not more than a single adverse "event" every 100 years) without holding the runway extension hostage to spending the gargantuan sums of money to increase the distance between the highway and the runway 32' (i.e. without perfect design standard compliance). Highlights from the Exhibit 3 risk analysis for the existing proximity between the runway and Hwy 551:

(A) The landing risk is "one incident in every 16.7 trillion landings, the time between occurrences is calculated as 16 trillion landings divided by 45,115 landing operations per year which equates to one incident every 369,000 years."
(B) The landing roll risk is "one incident in every 12.5 million landings, the rate of occurrence is calculated as 12.5 million landings divided by 45,115 landings per year which equates to one incident every 277 years" at worst or more likely "one incident in every 16.7 million landings, the rate of occurrence is calculated as 16.7 million landings divided by 45,115 landings per year which equates to one incident every 369 years."
(C) The takeoff roll phase, the risk is "one incident in every 45.5 million takeoffs, the rate of occurrence is calculated as 45.5 million takeoffs divided by 45,115 takeoffs per year which equates to one incident every 1,008 years."

[3] ODAV says the distance between the runway and Hwy 551 must be much greater, but there can be no dispute that just 32 feet that is needed for the runway to meet the FAA design standard. No one knows why ODAV claims that such greater distance is required. ODAV isn't saying.

(D) The landing roll phase risk to taxiway is "one incident in every 11.1 million landings, the rate of occurrence is calculated as 11.1 million landings divided by 45,115 landings per year which equates to one incident every 246 years."

What the FAA is almost certainly telling ODAV, is what it tells everyone - that the MP has to contemplate merely a "pathway to compliance". In other words, FAA needs only to see that ODAV plans to address design standards over the life of the MP - if there is funding to do so. The FAA cannot assert that it will not allow the runway to be lengthened unless and until the distance between the runway and Highway 551 is increased by 32 feet, because FAA has rules for exactly this situation that allow modifications on showing that safety is maintained. And it routinely grants the same. Thus, what ODAV's MP ***should be showing*** is a modification of standards (based on Exhibit 3 or a document like it) allowing the runway to be lengthened now - as an "interim" measure - with the MP promising that by the end of the MP planning period of 20 years, that Hwy 551 will be moved the 32 feet west, within the existing ODOT right-of-way to achieve perfect design standard compliance, if funding is available to do so. This is not hard.

ODAV also falsely asserts that the FAA is demanding that the north and south drain-fields that support two of the airport's major collective septic systems must be moved, but ODAV has not identified locations where either can be feasibly moved. Here again, FAA rules do not require this extreme that ODAV insists upon, but rather the FAA requires simply the drain-fields meet certain soil compaction standards, which, with modest improvement, the drain-fields can meet. The only evidence in ODAV's record is that the drain-fields can be improved to meet FAA rules. ODAV asserts, without providing any support for their claim, that they think otherwise. But one thing is clear: the FAA does not demand that the drain-fields be moved at all, rather only that they meet compaction requirements. This is ODAV's harmful demand, and ODAV's alone.[4]

Therefore, ODAV's MP "preferred alternative" includes a phasing plan that no runway extension can occur until and unless Highway 551 is moved west and that demands removal of the critically necessary septic drain fields, to nowhere are based upon wholly false premises that ODAV refuses to correct. ODAV is refusing to apply for Modification of Standard, when that is normative and what every other airport in ODAV's situation would and does do – with success. As such, ODAV is needlessly, if not negligently, pursuing a Master Plan that will severely damage the airport and the significant private investment in it.

ODAV IS IGNORING ITS LEGISLATIVE COMMAND

Per the recommendation of the Oregon Economic Development Department, the Oregon legislature specifically adopted ORS 836.640 and ORS 836.642 (Exhibit 4 attached) to make Aurora Airport and a handful of other sites economic powerhouses for their region. These statutes

[4] The aviation stakeholders suspect that ODAV is trying to push the aviation stakeholders to annex to the City of Aurora. The City of Aurora's current mayor publicly stated he wants to annex the airport to get its tax base. Previous mayors are on record expressing desires to shut the airport down and the city has litigated against the airport ceaselessly. If is indeed ODAV's secret plan to get the airport annexed into the City of Aurora, then ODAV must disclose that and have a transparent discussion on the topic. Hidden agendas help no one and public agencies are not supposed to harbor them.

are the "Through the Fence Operations" program and require ODAV "to encourage through the fence operations designed to promote economic development by creating family wage jobs, by increasing local tax bases and by increasing financial support" for such airports through "public-private partnerships." "Through the fence operations" are defined as the usual and customary aeronautical activities by a "commercial or industrial user" in the "airport boundary."

ODAV is ignoring this command in the development of this new MP and ALP. Instead, it undermining the investments made in good faith by private industry on the strength of the statutes, in the following ways:

1. Demanding removal of the septic drain-fields that the through the fence operations rely upon (with no identified feasible alternative locations) on the wholly false claim that FAA demands such.
2. Refusing to submit a well-documented risk assessment provided by "through the fence" stakeholders that is Exhibit 3 (or an assessment ODAV thinks is better) to support an "interim" modification of standard to enable the runway to be extended now and the highway moved later when there is funding to do so.
3. Identifying the privately owned through the fence areas established by the above statutes, as land not honored for its aeronautical investment and economic development success, but rather as land ODAV will buy up, if funding becomes available to do so.
4. Refusing to expand the airport boundary to include and thus support all of the previous MP identified through the fence properties.[5]

ODAV PRESENTED ALTERNATIVES THAT CAUSED NEEDLESS ANGST, THEN SELECTED A DIFFERENT ONE

ODAV presented startling alternatives to its Master Plan Public Advisory Committee (PAC) on 7/31/24. During the presentation, ODAV and its consultants stated the alternatives were all premised on the (false) claim the FAA said no runway extension could occur unless the Highway 551 Runway Object Free Area (ROFA) design standard was first met.

This incorrect premise drove all ODAV's binary 7/31 alternatives that needlessly pitted aeronautical interests against homeowners and nonaeronautical businesses – one alternative moving Highway 551 west significantly more than is needed to meet the FAA's design standard, and in so doing wiping out homes and businesses ***or*** moving the runway (and air traffic control tower) east, wiping out the private aeronautical investment at the airport and a truly awful alternative that blended the worst of both. Yet, to meet the 32 feet of increased distance between the runway and Highway 551, all that was needed is 32 feet and that can all be taken from the existing right-or-way – no homes or businesses needed to be wiped out at all. And, all of ODAV's

[5] Per the above statutes, aeronautical through the fence operations can only occur within the airport's "boundary." The airport's "boundary" is a term of art that simply identifies all areas master planning identifies as suitable for aeronautical activity. All Aurora Airport MPs have identified particular areas adjacent to the airport as suitable for airport related uses. Yet, ODAV STILL has not expanded the boundary to include all of those properties and so far is apparently not planning to do so in the current iteration of the MP.

"alternatives" wiped out the septic drain-fields that enable private investment to exist. And all of the alternatives included an unwise internal airport access road paralleling the active taxiway and runway, when it is elementary airport planning that such is to be avoided as a matter of safety. Yet even though the 2012 MP approved an internal airport access road (that is already partially built) that is internal to the airport and does not run the risk of unintended internal traffic - like an Amazon driver in the driving rain, inadvertently finding their way onto the active taxiway or runway, ODAV with no explanation, ignored that reasonable and prudent option. The preferred alternative now puts the internal access road in a new location, perilously close to the runway and next to the active taxiway.

Finding themselves, the "adult in the room", the airport's aeronautical stakeholders presented an airport MP alternative that extended the runway to the north in the short term to serve the decades-plus long need for improved existing aircraft safe operations. The stakeholder's alternative provided a fully documented Modification of Standard study (Exhibit 3) demonstrating unequivocally that Modification of Standard requirements were met through careful risk analysis, to support the runway lengthening. It also contemplated HWY 551 be moved 32 ft to the west after the runway extension happens, and later in the MP planning period and within the acquired ODOT right of way (taking no homes/businesses), if funding is available. It contemplates the drainfield simply be improved to FAA standards and remain in place. And restored the 2012 internal access road so that there were no risks of incursions.

To date, ODAV has ignored this alternative and worse, would not allow discussion of the proposed alternative during the October 15, 2024 Public Advisory Committee meeting.

What ODAV did was to decide that a modified Alternative 1A be identified as the preferred alternative (Exhibit 1). This alternative was the best of the three truly terrible alternatives ODAV floated. This one moves Hwy 551 west – but well more than the 32 feet that is needed, puts the internal circulation road along side the active taxiway and runway, removes the septic drain fields to nowhere, fails to expand the airport boundary and still shows ODAV buying up, tearing down front privately owned front row hangars, only to rebuild new hangars that would be leased out by the State. Additionally, the ODAV shows intent to purchase privately owned properties now devoted to aeronautical uses. Newly part of this alternative as of October 16, 2024, is that the critically needed runway extension is planned to languish and is only "phased in" when Hwy 551 is moved. ODAV can do better. And in its history, it has done better.

THE ASK

We need your help. ODAV has lost its way. We ask that the Oregon Aviation Board to recognize the damaging effect presented by this plan to private investment made in good faith in accordance with the State statute. Please confer with the Governor's Office to convene the key players – Governor's Office, FAA, ODAV, ODOT, airport stakeholders, nearby Cities, Marion and Clackamas County, and interest groups – for an open discussion of the future of the airport. If people simply have a way to talk to each other, we think many of these problems can be avoided.

If that is not doable, we ask that ODAV be directed to support its preferred alternative 1A with the following very modest and normative changes:

- Phase in the runway extension at least 500 feet to the north **as an immediate action** regardless of the 32' of imperfect ROFA compliance and, to prove up on safety doing so, submit the Exhibit 3 Modification to Standards to FAA to support it. The FAA will approve it. Call this step an interim measure, subject to moving Highway 551 in the longer term, when funds are available (next bullet).
- Plan to move Highway 551, 32 feet west (and also move the airport's perimeter fence proportionately west), outside the ROFA but within ODOT right-of-way by the end of the planning period if funding is available.
- The septic system drain-fields be brought to FAA standard and remain in place.
- Remove the Vehicle Service Road from the plan and replace it with the Internal Circulation Road as approved in the 2012 Master Plan Update.
- Remove the parallel taxi-lane from the ball, negating (and removing) the need for the indicated taking of the front row hangars.
- The airport boundary is adjusted to include the property that all airport Master Plans have shown as suitable for airport development.

Preferred Alternative

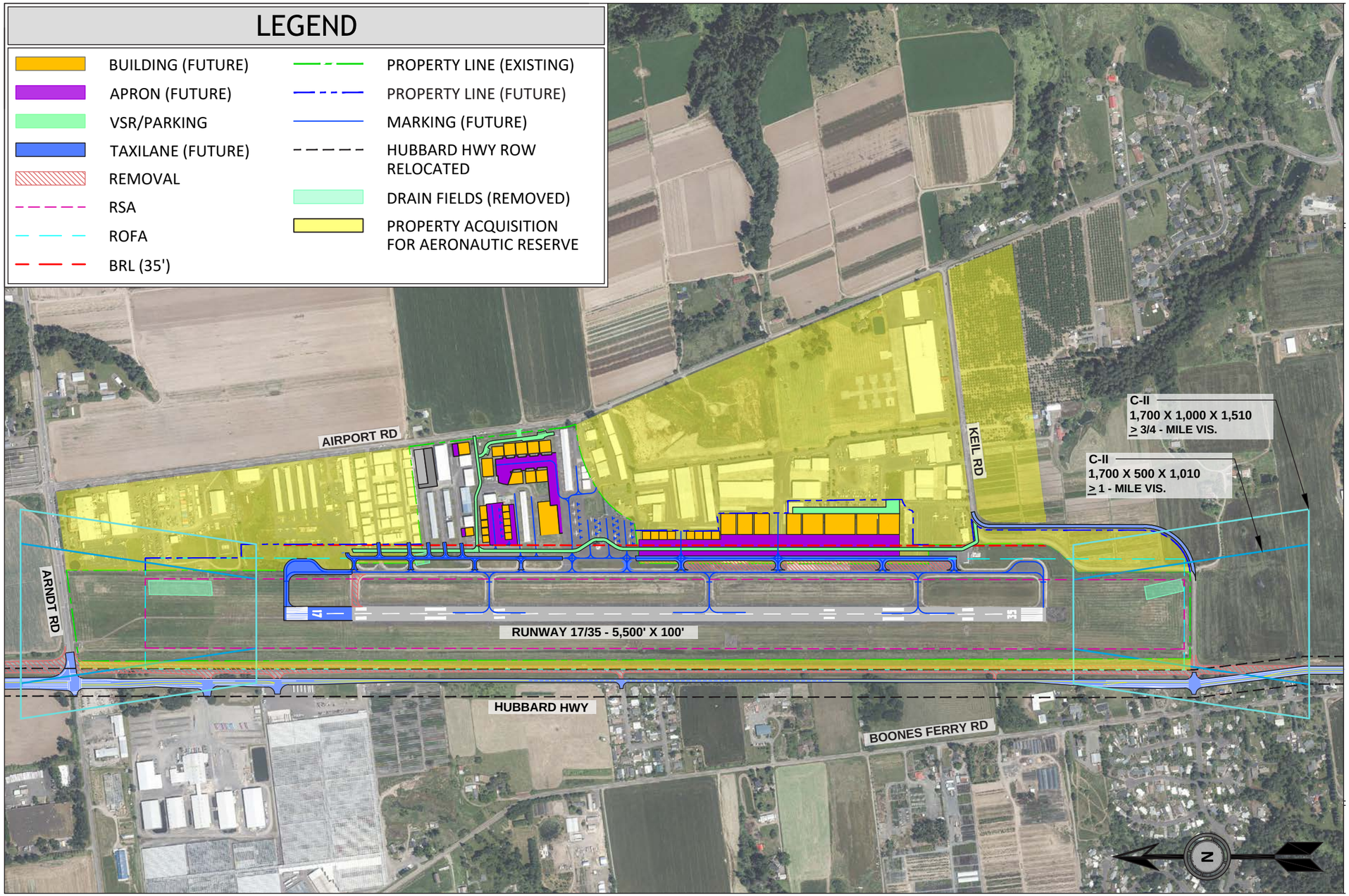
Project Update 10/15/2024

Refined Preliminary Alternative 1A was selected as the preferred alternative following an extensive review of all feedback provided by the FAA, members of the PAC, airport users, and the public throughout the planning process. The preferred alternative identifies a path to conformance to correct the existing non-standard ROFA and RSA as required by the FAA, and it offers advantages over the other preliminary alternatives including:

- It maintains the runway in its current location compared to Refined Preliminary Alternatives 1B and 2.
- It reduces the impacts on west residential properties compared to Refined Preliminary Alternative 1B.
- It does not require relocation of the ATCT as required in Preliminary Alternative 2.
- It provides phased opportunities for the flexible implementation of projects to conform to standards, improve efficiency, and improves safety. The phases of these projects are in no specific order of implementation; however, based on FAA input, the phase to extend the runway would not occur until the phase to meet ROFA and RSA standards are completed. The phases of the preferred alternative include:
  - » Figure 1: Preferred Alternative Overview
  - » Figure 2: Phase for projects needed to meet ROFA & RSA conformance standards
  - » Figure 3: Phase for addition of a vehicle service road (VSR)
  - » Figure 4: Phase for runway and parallel taxiway extension
  - » Figure 5: Phase for the addition of a parallel taxilane
  - » Figure 6: Property Overview

PREFERRED ALTERNATIVE

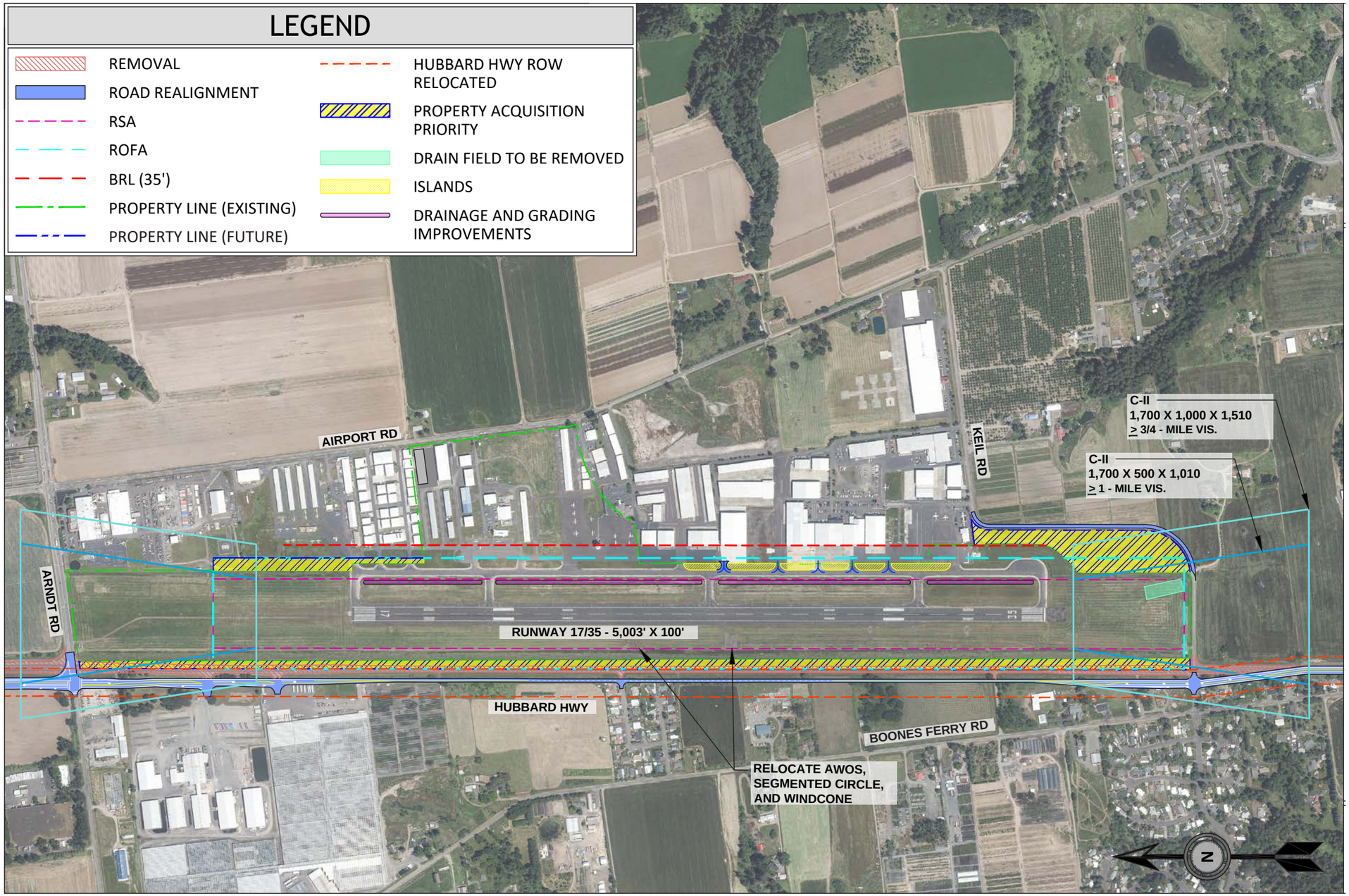
Figure 1: Overview



CENTURY WEST ENGINEERING

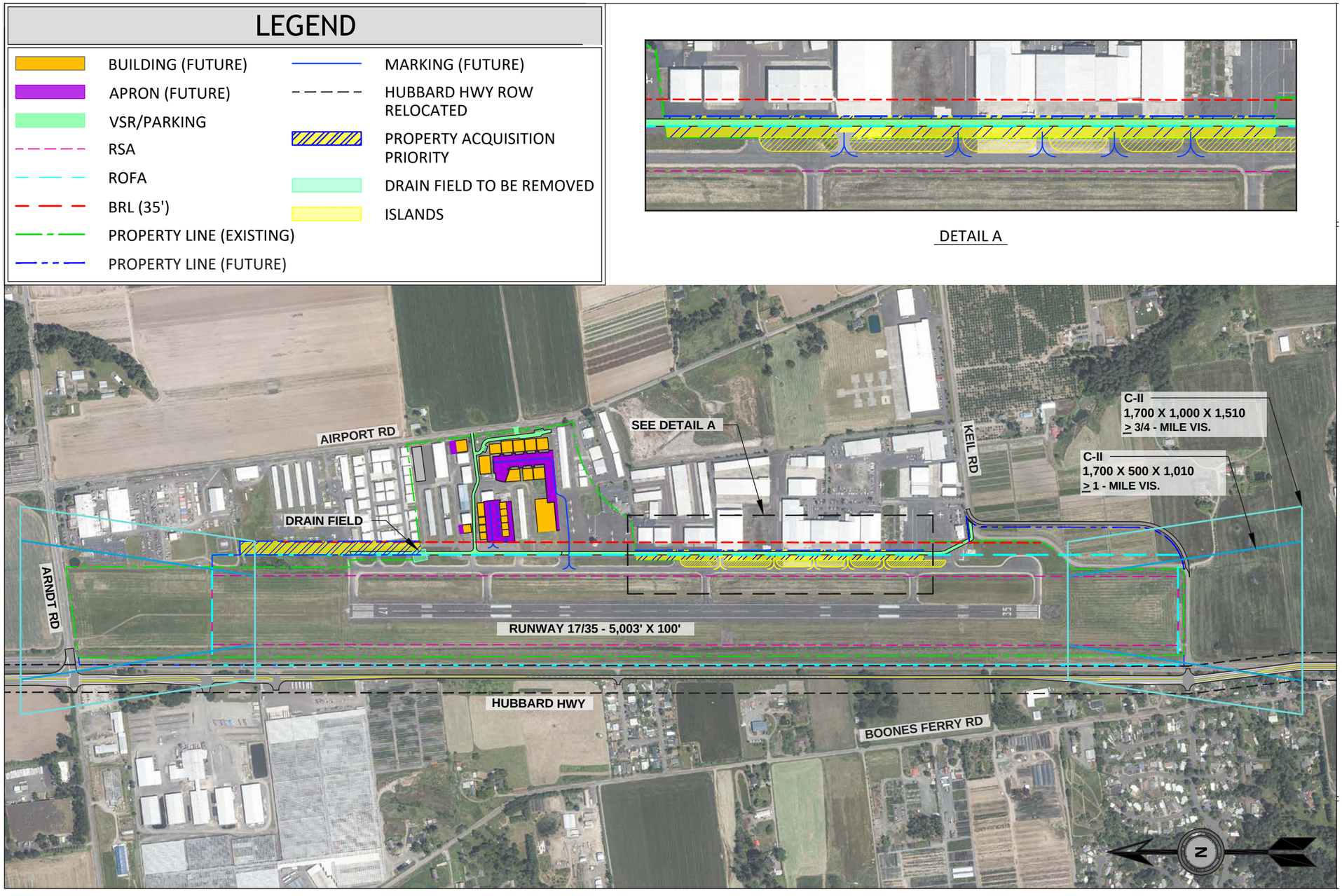
PREFERRED ALTERNATIVE

Figure 2: Meet ROFA & RSA Conformance Standards



PREFERRED ALTERNATIVE

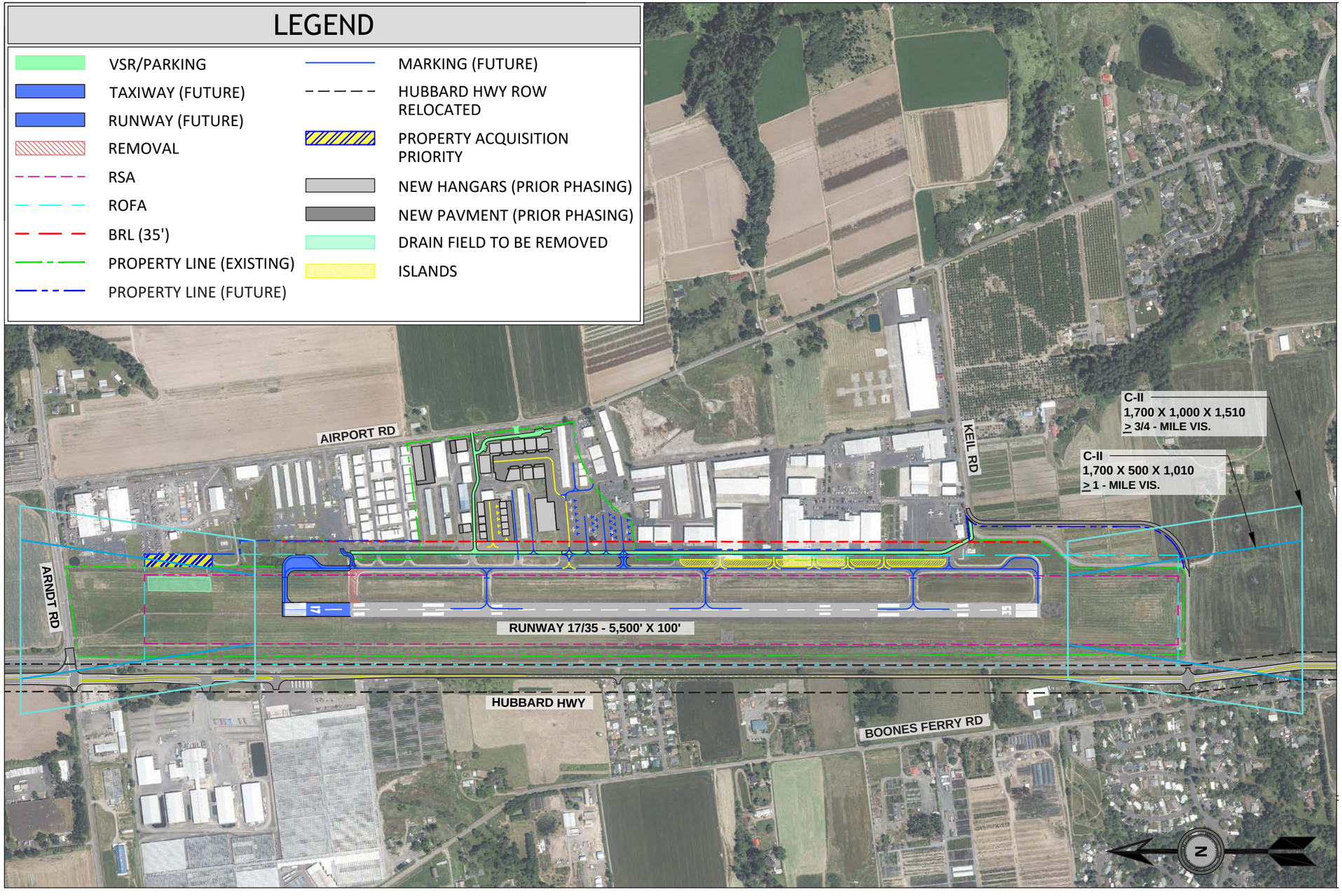
Figure 3: Addition of a Vehicle Service Road (VSR)



CENTURY WEST ENGINEERING

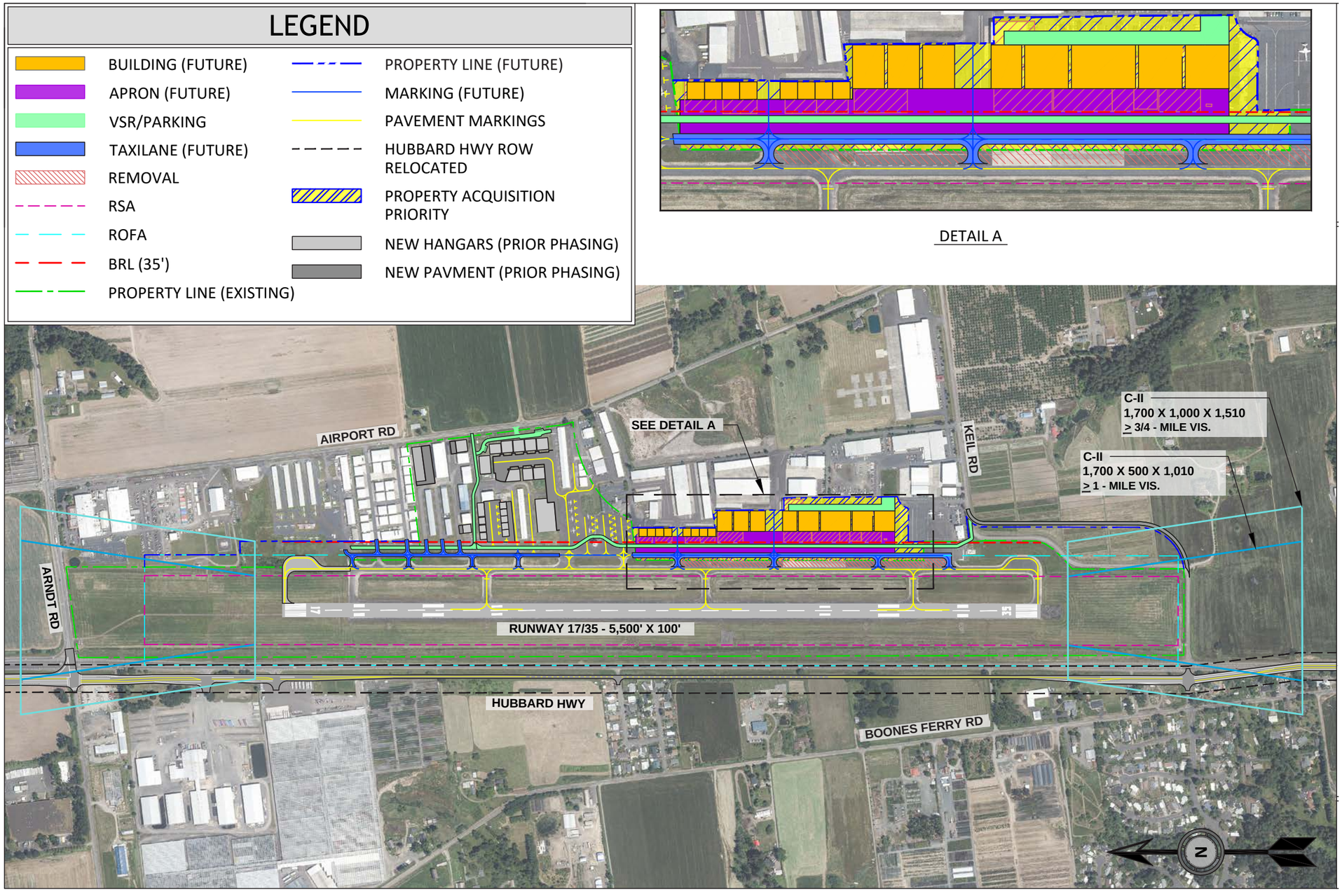
PREFERRED ALTERNATIVE

Figure 4: Runway and Parallel Taxiway Extension



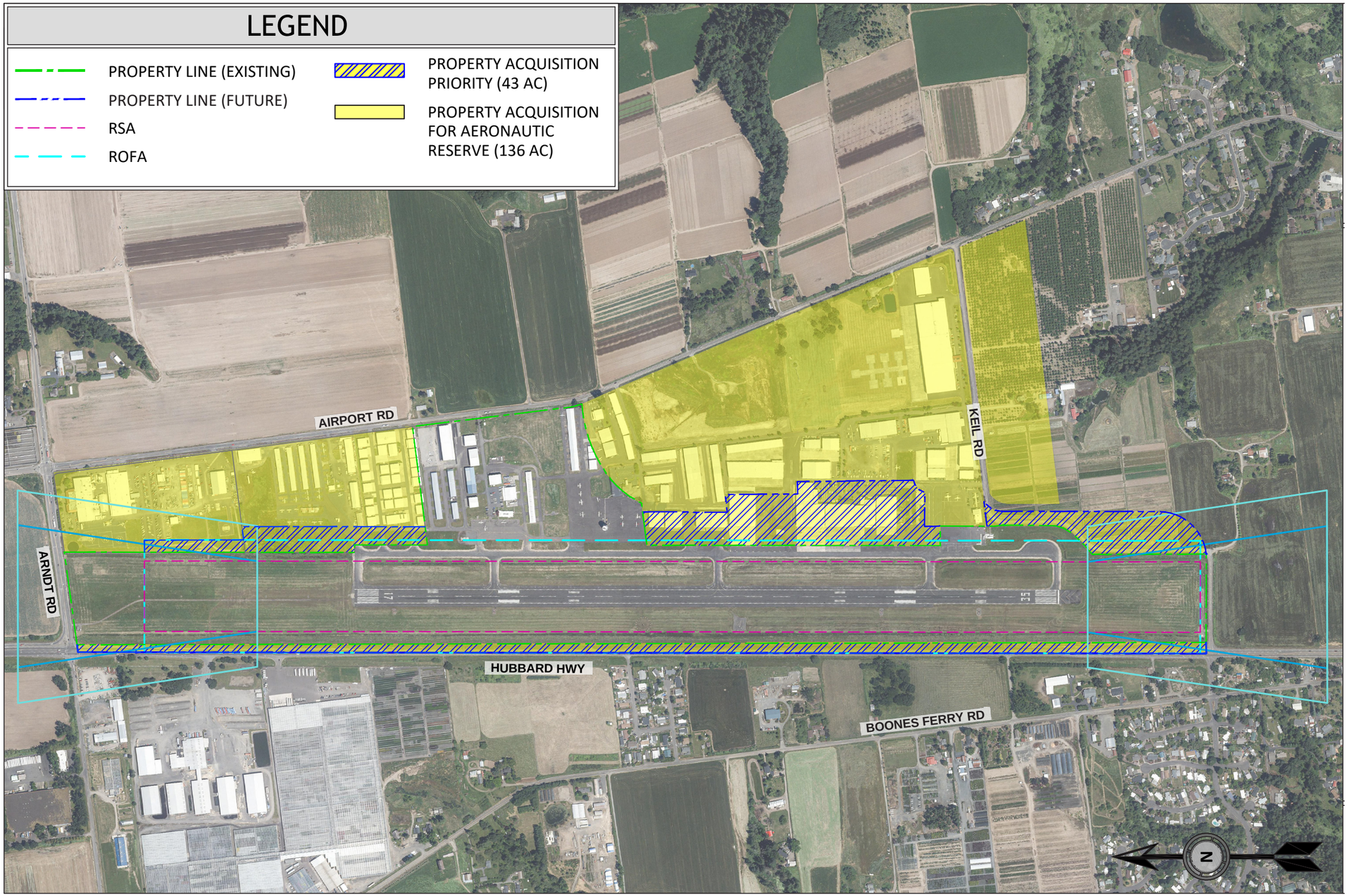
PREFERRED ALTERNATIVE

Figure 5: Addition of a Parallel Taxilane



PREFERRED ALTERNATIVE

Figure 6: Property Overview



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October 15, 2024

Via US CERTIFIED MAIL
& Courtesy Electronic Mail
William "Chuck" Garrison
Director
Federal Aviation Administration
2200 S 216th St.
Des Moines, WA 98198

RE: Aurora State Airport Master Plan

Dear Mr. Garrison:

The undersigned represents the private aviation stakeholders responsible for more than $300 million in investment at the airport who are directly impacted by the State of Oregon's in-process update to the Aurora State Airport Master Plan. An issue has arisen for which we seek your clarification.

Although a runway extension was included in the 2012 Aurora State Airport Master Plan and the approved Airport Layout Plan, it was never constructed. The runway extension is not meant to serve new aircraft, but rather to ensure the safety of the aircraft currently using the airport.

The Oregon Department of Aviation (ODAV) is claiming that the FAA is requiring—

(1) Perfect airport design standard compliance before the runway may be extended. And that without perfect design standard compliance, that the FAA will put the airport into "maintenance mode".

(2) A septic drain field be moved even though there is no location identified where it can be moved, and there is no dispute that the current drain field can be improved to meet design standards.

Further ODAV is claiming that the FAA is refusing to consider much less approve of any Modification of Standards (MOS) needed for the modest Runway Object Free Area (ROFA) adjustment (32 feet) because state Highway 551 is just 32 feet short of ROFA compliance.

You are no doubt aware that FAA is required to consider and approve a MOS "when necessary to meet local conditions" so long as the "modification will provide an acceptable level of safety, economy, durability and workmanship." (*See,* 14 CFR § 152.11(b)).

The design standards for which ODAV claims FAA demands perfect prerequisite compliance for any runway extension applies to all airports in the US. The FAA routinely

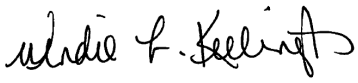
approves MOS for large airports nationwide some with genuine safety concerns. Nothing suggests Aurora has some super anomaly warranting the disparate treatment ODAV claims FAA demands.

A MOS ROFA for Highway 551 can be approved because the risk presented is extremely small and far better than the FAA's 100-year occurrence standard as the attached report explains in detail. In sum—

(A) The landing risk is "one incident in every 16.7 trillion landings, the time between occurrences is calculated as 16 trillion landings divided by 45,115 landing operations per year which equates to one incident every 369,000 years."
(B) The landing roll risk is "one incident in every 12.5 million landings, the rate of occurrence is calculated as 12.5 million landings divided by 45,115 landings per year which equates to one incident every 277 years" at worst or more likely "one incident in every 16.7 million landings, the rate of occurrence is calculated as 16.7 million landings divided by 45,115 landings per year which equates to one incident every 369 years."
(C) The takeoff roll phase, the risk is "one incident in every 45.5 million takeoffs, the rate of occurrence is calculated as 45.5 million takeoffs divided by 45,115 takeoffs per year which equates to one incident every 1,008 years."
(D) The landing roll phase risk to taxiway is "one incident in every 11.1 million landings, the rate of occurrence is calculated as 11.1 million landings divided by 45,115 landings per year which equates to one incident every 246 years."

Since the ODAV has provided nothing in writing from the FAA we believe that ODAV is mistaken about the agency's demands and urgently request that you clarify FAA's requirements at your earliest opportunity. This is extremely time sensitive because all of ODAV's actions concerning the master plan update are predicated upon their claimed FAA premise demands.

Very truly yours,



Wendie L. Kellington

WLK:wlk
Attachment – UAO Airport Risk Analysis for ROFA Mod to Standards
CC: Shannetta Griffin, PE, FAA Office of the Associate Administrator for Airports, shanetta.r.griffin@faa.gov
John R. Dermody, FAA Office of Airport Safety and Standards, John.Dermody@faa.gov
Clients
Aron Faegre, AIA, PE

Airports and Landing Fields

ORS 836.642
Program for through the fence operations

- **rules**

(1) The Oregon Department of Aviation shall establish a pilot program at up to six rural airports to encourage development of through the fence operations designed to promote economic development by creating family wage jobs, by increasing local tax bases and by increasing financial support for rural airports. To the extent practicable, the airport sponsor of a pilot site shall use public-private partnerships that incorporate:

(a) Innovative and creative technologies for increasing airport usability and safety;

(b) Innovative and creative performance of aviation services to make the services more competitive and useful for the public;

(c) Development of the pilot site as a setting for customary and usual aviation-related activities to develop and thrive, in concert with the goals of the Oregon Business Development Department; and

(d) Shared responsibility for:

(A) Establishing and meeting the fiscal needs of the pilot site;

(B) Maintaining safety of operations; and

(C) Maintaining positive community relations and compatibility with existing uses.

(2) The pilot program shall operate at:

(a) The Aurora State Airport; and

(b) Not more than five additional rural airports that volunteer to participate and are selected by the Oregon Department of Aviation with the concurrence of the county in which each rural airport is located.

(3) The Oregon Department of Aviation, by rule, shall provide standards and guidelines for through the fence operations that:

(a) Ensure that the operations provide financial support to the pilot sites in compliance with Federal Aviation Administration regulations;

(b) Require submission, review, approval and, as appropriate, revision of a facility site plan for each through the fence operation so that the real property covered by the site plan can be incorporated into the airport boundary and coordinated with the other aspects of the airport master plan;

(c) Ensure that the operations are conducted according to a written contract between the commercial or industrial user of property within the airport boundary and the airport sponsor;

(d) Ensure that pilot sites continue to operate in a safe manner and to fulfill their roles in Oregon's emergency response system;

(e) Preserve investments in pilot sites and the level of service provided by pilot sites;

(f) Facilitate orderly management of pilot sites;

(g) Provide equitable and uniform treatment of airport tenants and users at pilot sites;

(h) Advance economic development through qualified customary and usual aviation-related activities within the airport boundaries of pilot sites;

(i) Encourage well-ordered economic development within the airport boundaries of the pilot sites;

(j) Facilitate and foster good relations with the communities surrounding the pilot sites;

(k) Enable conformity with approved airport master plans;

(L) Make pilot sites available for public use on reasonable terms; and

(m) Assist pilot sites in developing financial self-sufficiency through the use of innovative funding and economic development programs.

(4) The Department of Land Conservation and Development, the county and a city, if any, within whose jurisdiction a pilot site is located shall coordinate with the Oregon Department of Aviation to ensure that the applicable comprehensive plans and land use regulations, including airport zoning classifications pursuant to ORS 836.600 (Policy) to 836.630 (Siting of new airports to comply with land use laws), facilitate through the fence operations and support the development or expansion of the pilot site consistent with applicable statewide land use planning requirements.

(5) The Oregon Business Development Department shall assist the pilot sites to:

(a) Identify, qualify for and apply for funding from appropriate grant and loan programs; and

(b) Develop innovative short-term and long-term funding opportunities.

(6) To the extent practicable, the airport sponsors shall utilize innovative airport infrastructure and operations funding to support the pilot sites including, but not limited to:

(a) Airport districts as provided in ORS chapter 838;

(b) Economic development programs administered by the Oregon Business Development Department;

(c) Tax increment financing to provide funding for airport-related infrastructure;

(d) United States Department of Agriculture Rural Development grants or low-interest loans; and

(e) Programs, including funding for short line railroads under ORS 367.067 (Short Line Credit Premium Account), designed to facilitate development of intermodal

transportation projects. [2005 c.820 §3; 2009 c.398 §2]

Location:.

Aron Faegre Airport Planning & Design 13200 Fielding Road Lake Oswego Oregon 97034 aron@faegre.org

Aurora State Airport (UAO)
Proposed Modification of
Runway Object Free Area (ROFA) Design Standards

Prepared by: Aron Faegre, AIA, PE
Aron Faegre Airport Planning & Design

August 29, 2024

This memorandum provides an analysis and methodology by which a Modifications of FAA Airport Design Standards (MOS) at the Aurora State Airport (UAO), for the Runway Object Free Area (ROFA) can be justified as:

> "… resulting in an acceptable level of safety, useful life, lower costs, greater efficiency, or the need to accommodate an unusual local condition on a specific project through approval on a case-by-case basis." - FAA Order 5300.1G, page 1.

as defined and permitted under FAA Order 5300.1G Modifications to Agency Airport Design, Construction, and Equipment Standards[1].

1. BACKGROUND

The Aurora State Airport is surrounded by farm lands, near Aurora, Oregon, at the northern end of Marion County. It primarily serves aviation businesses involved with:

- emergency medical transport[2],
- aviation heavy-lift helicopter fire-fighting and power line construction companies (for which fixed wing aircraft are essential for support),[3]
- business jets for numerous major national corporations based within 10 miles,
- aircraft manufacturing for the S-LSA (Special Light-Sport Aircraft) and kit-build

[1] FAA Order 5300.1G Appendix A specifically gives FAA Office of Airport (ARP) and Region the authority to issue a MOS for Runway Object Free Areas. The Order can be downloaded at: https://www.faa.gov/documentLibrary/media/Order/order-5300-1G-modifications-to-standards.pdf .
[2] Regional headquarters for Life Flight Network, with bases all over Oregon, Washington, Idaho, Montana, and Nevada.
[3] Columbia Helicopters, Helicopter Transport Services, Wilson Construction, companies that work internationally with headquarters at Aurora Airport. The use of the Aurora Airport runway is essential to these companies for rapid providing of crews, equipment, and repairs to helicopters in active service of fighting fires, moving power lines, or doing rescue, relief, or humanitarian work.

industry[4], and

- other general aviation aircraft using the airfield for business, pilot training, and recreational flying.

There is no scheduled air service using the airport. The State of Oregon Department of Aviation (ODAV) owns, governs, and manages the public lands of the airport. Most of the business aircraft based at the airport access the runway via through-the-fence permits with ODAV.

Flights by based business jets, such as a Challenger 300, dictate that the Airport Reference Code is C-II. Due to the geometry of the existing site, the airport does not meet current FAA design standards for the ROFA, due primarily to adjacent Highway 551 to the west of the runway.

Most recently ODAV's planned solution[5] to meeting these standards ("Refined Preliminary Alternatives Summary", by Century West Engineering, dated July 31, 2024) is one of only two options:

- relocate the highway further west, (which involves acquiring both private residential and commercial properties further west), or
- relocate the runway, taxiway, and control tower east (which involves acquiring many acres of existing private property already developed with hangars, taxilanes, and aprons for aviation uses) and demolishing numerous large 40,000 square foot aviation hangars along the taxiway.

Both options have very high financial and environmental costs (probably in the greater than $100 million range), which would make them difficult to ever be implemented. If this master plan is approved as currently planned, and one of these options were not implemented, then ODAV and FAA have reported that the airport would only receive maintenance funding and no additional safety improvement funds. This would result in the airport not keeping pace with the aviation industry standards of safety. The second option (moving the runway, control tower, and demolishing hangars), If implemented, would in addition force closure of many of the major medical transport and fire-fighting facilities on the airport, and would put many of the airport's 1,500 employees out of jobs.

It is noted that in the 2012 Airport Layout Plan (ALP), approved (signed) by both ODAV and FAA, the airport also had the same Runway Design Code (RDC) status of C-II and

[4] Van's Aircraft www.vansaircraft.com the international leader in S-LSA produced aircraft.
[5] Refined Preliminary Alternatives Summary document dated July 31, 2024 by Century West Engineer can be downloaded at: https://publicproject.net/files/UAOAMP/uao-refined-preliminary-alternatives-summary-1-.pdf?d952c4adef .

listed a MOS as the solution to the non-standard ROFA limitation on the west property line. At that time there was consensus between ODAV and FAA that a MOS was a reasonable solution.

This memorandum provides the evidence to show that the 2012 ALP was a good approach to resolution of the ROFA, and that it can reasonably be continued. This report demonstrates that there is an acceptable level of safety through modifying the ROFA standard for the specific deviation to standards located on the west side of the runway.

FAA standards for different airports ROFA's vary from 250 foot width, to an 800 foot width, depending on aircraft type using the airport. As will be shown below, the primary reason justifying the modification is that the going from B-II to C-II category is just where the 500-foot required ROFA width changes to an 800-foot wide required ROFA - yet this is the same width required for all RDC category aircraft all the way to E-VI -Portland International Airport, San Francisco Airport, and every other international airport in the country. UAO will never have the larger size of aircraft those airports accommodate – Boeing 737's to Boeing 777's – so a slight reduction in width on the west side provides a level of safety appropriate for UAO, which will always serve only much smaller aircraft.

Modifications of standards for ROFA's are common at even large national airports. For example, recently several MOS were adopted at San Jose International Airport for deficiencies in the ROFA, as well as for runway-taxiway separations, and for runway object free areas[6]. It even appears that Portland International Airport (PDX) may have their airport perimeter fence, the shoulder of NE Marine Drive, and improper grading within the 400-feet area from runway centerline, at the northeast corner of the ROFA for Runway 10L.

This memorandum provides the detailed technical background and mathematically calculated justification, needed for the FAA and ODAV to again approve a MOS for the ROFA at Aurora State Airport.

2. MOS PROCESS

The process for gaining a modification of standards is provided in FAA AC 150/5300-13B Airport Design[7] in Section 2.8. It states, and we provide commentary after each paragraph as to acceptability:

[6] Norman Y. Mineta San Jose International Airport Runway Incursion Mitigation/Airfield Design Standards Analysis, November 27, 2017. Justification for ROFA modifications in this document were often simply the practical and cost issues of modifying major adjacent highways, similar to what is at issue in a much smaller Aurora Airport.
[7] FAA AC 150/5300-13B Airport Design Available free on line at:
https://www.faa.gov/documentLibrary/media/Advisory_Circular/AC-150-5300-13B-Airport-Design-Chg1.pdf

2.8 ***Modification of Standards.***

Site-specific conditions may make it impractical to meet all FAA design standards at an airport. The FAA considers, on a case-by-case basis, modifications to design standards that result in an acceptable level of safety and efficiency. Specific operational controls may be necessary to establish an acceptable level of safety for operation of aircraft at the airport. FAA Order 5300.1 establishes FAA policy for administering airport requests for modification of standards. See paragraphs 2.4 and 2.5.

This memorandum provides this information and finds that no specific operational controls are necessary, see comments on paragraph 2.4 below.

2.8.1 The FAA views an approved modification of standards as an interim measure intended to mitigate unique site-specific conditions. Unless the FAA explicitly states otherwise in the approval action, the FAA expects airports with approved modifications to pursue ways to meet design standards. This may occur incrementally over time or at such time it becomes practical to correct the non-standard condition.

The FAA and ODAV can work with Oregon Department of Transportation on master planning future revisions to State Highway 551 so that it can be corrected "at such time it becomes practical." Also, there are potential options where ODAV and ODOT could jointly agree to relocate the airport perimeter fence closer to Highway 551, which could be an "incrementally" established improvement.

2.8.2 The FAA will not consider any request to modify design standards associated with the following:

- *RSA dimensions*
- *OFZ dimensions*
- *Approach or departure surface dimensions*
- *Standards established within a regulation (e.g., stopway, clearway).*

The ROFA is not one of these.

2.8.3 An airport seeking FAA approval of modification to a design standard submits a request using the Modification of Standards application tool within the Airport Data and Information Portal (ADIP) at https://adip.faa.gov. The FAA relies on the following information, in part, to determine the acceptability of a modification to FAA design standards:

- *Information on the standard proposed for modification.*
- *Description of proposed modification and why the airport cannot meet standards.*
- *Statement addressing how modification will provide an acceptable level of safety, economy, durability, and workmanship.*
- *Listing of any special operational measures necessary to accommodate the modification.*

This document was prepared to provide the analysis needed for ODAV to submittal for the MOS per Section 2.4.

2.4 Addressing Non-standard Airport Conditions.

> *The FAA expects airport owners to address non-standard conditions through the airport planning process. The FAA acknowledges that conformance to current standards is not always practical. However, the FAA expects airports to continue to investigate mitigation measures, whether in one or multiple phases, and correct the non-standard conditions over time.*

It is important to re-emphasize the above statement, that the FAA here "acknowledges that conformance to current standards is not always practical." Further, per this paragraph, the current master planning activity is the appropriate place for this analysis and the formal establishment of a MOS for the ROFA. This report and analysis identifies intermediate steps that can be taken, such as relocating the airport perimeter fence, that will iteratively move the airport closer to compliance.

This analysis utilizes an FAA established safety analysis methodology to show that the MOS provides an acceptable level of safety. The study found no special measures needed to accommodate the modification.

3. METHODOLOGY

In 2011, the Transportation Research Board (TRB) released Airport Cooperative Research Program (ACRP) Report #51 – Risk Assessment Method to Support Modifications of Airfield Separation Standards. The ACRP is funded by the Federal Aviation Administration (FAA). Report #51 is used to support the ROFA MOS requested at Aurora State Airport.

The proposed ROFA MOS is modeled in this report in accordance with Appendix A – Risk Assessment Methodology of ACRP Report #51[8].

This report uses risk plots, along with the annual number of operations, to analyze the cumulative risks associated with Runway to Object Separations. The operations numbers at UAO are taken from the current draft Master Plan, and are numbers already approved by the FAA in a letter[9] to ODAV dated November 15, 2023 (corrected January 23, 2024). For sake of a conservative analysis, we are using the most distant forecast projects for the year 2041, which are:

- 90,231 total operations all RDC categories, of which
- 862 operations are of RDC C-II and D aircraft

[8] ACRP Report #51 – Risk Assessment Method to Support Modifications of Airfield Separation Standards is available free on line at: https://nap.nationalacademies.org/catalog/14501/risk-assessment-method-to-support-modification-of-airfield-separation-standards

[9] Federal Aviation Administration (FAA) Aurora (UAO Aviation Activity Forecast Approval Airport Improvement Program Grant Number 3-41-0004-022-2021 available at: https://publicproject.net/files/2024-01/Aurora-Airport/uao-forecast-approval-20231115-corrected-20240123.pdf?57af6c19b7

For operations involving the runway, per the methods of Report #51, the risk is analyzed based on three distinct phases of flight:

a. Landing - Airborne Phase
b. Landing - Ground Phase
c. Takeoff

The separation distance from the runway centerline to an object is used with the associated risk plot to calculate the risk of collision per operation.

The risk of collisions per operation is then analyzed along with the number of annual airport operations for the appropriate phase of flight to determine the predicted frequency of occurrence. The frequency of occurrence is used to determine the FAA likelihood level using Table A-3 from ACRP Report #51 which is shown below:

Table A-3. FAA likelihood levels (FAA, 2010).

	General	Airport Specific	ATC Operational	
			Per Facility	NAS-wide
Frequent A	Probability of occurrence per operation is equal to or greater than 1×10^{-3}	Expected to occur more than once per week or every 2,500 departures (4×10^{-4}), whichever occurs sooner	Expected to occur more than once per week	Expected to occur every 1–2 days
Probable B	Probability of occurrence per operation is less than 1×10^{-3}, but equal to or greater than 1×10^{-5}	Expected to occur about once every month or 250,000 departures (4×10^{-6}), whichever occurs sooner	Expected to occur about once every month	Expected to occur several times per month
Remote C	Probability of occurrence per operation is less than 1×10^{-5} but equal to or greater than 1×10^{-7}	Expected to occur about once every year or 2.5 million departures (4×10^{-7}), whichever occurs sooner	Expected to occur about once every 1–10 years	Expected to occur about once every few months
Extremely Remote D	Probability of occurrence per operation is less than 1×10^{-7} but equal to or greater than 1×10^{-9}	Expected to occur once every 10–100 years or 25 million departures (4×10^{-8}), whichever occurs sooner	Expected to occur about once every 10–100 years	Expected to occur about once every 3 years
Extremely Improbable E	Probability of occurrence per operation is less than 1×10^{-9}	Expected to occur less than once every 100 years	Expected to occur less than once every 100 years	Expected to occur less than once every 30 years

Note: Occurrence is defined per movement.

Source: ACRP Report #51

The key takeaway from Table A-3 is that for a specific airport, if the likelihood of incidence is less than once every 100 years it is considered a “Extremely Improbable” Class E occurrence.

A Hazard Severity Classification is then assigned based on the worst credible outcome of an incident. Since the ACRP method is based on wingtip separation, the report states that: “From the point of view of risk and based on the records of incidents and accidents,

the worst credible consequence expected for wingtip collisions of two taxiing aircraft is aircraft damage" (ACRP Report #51 page 19). A similar aircraft damage expectation would be a wingtip collision with the airport perimeter fence, which is the ROFA limitation examined in this report.

The Hazard Severity Classifications were determined in accordance with Table A-4 FAA Severity Definitions from ACRP Report #51 and are shown below:

Table A-4. FAA severity definitions (FAA, 2010).

Hazard Severity Classification				
Minimal 5	**Minor 4**	**Major 3**	**Hazardous 2**	**Catastrophic 1**
No damage to aircraft but minimal injury or discomfort of little consequence to passenger(s) or workers	- Minimal damage to aircraft; - Minor injury to passengers; - Minimal unplanned airport operations limitations (i.e. taxiway closure); - Minor incident involving the use of airport emergency procedures	- Major damage to aircraft and/or minor injury to passenger(s)/ worker(s); - Major unplanned disruption to airport operations; - Serious incident; - Deduction on the airport's ability to deal with adverse conditions	- Severe damage to aircraft and/or serious injury to passenger(s)/ worker(s); - Complete unplanned airport closure; - Major unplanned operations limitations (i.e. runway closure); - Major airport damage to equipment and facilities	- Complete loss of aircraft and/or facilities or fatal injury in passenger(s)/ worker(s); - Complete unplanned airport closure and destruction of critical facilities; - Airport facilities and equipment destroyed

Source: ACRP Report #51

Then, using both the FAA likelihood level and the Hazard Severity Classification the risk is then analyzed using Figure A-1 FAA Risk Matrix from ACRP Report #51, shown below:

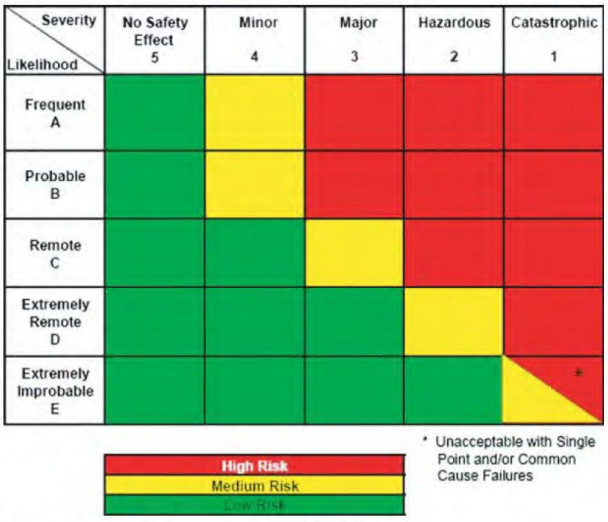


Figure A-1. FAA risk matrix (FAA, 2010).

Source: ACRP Report #51

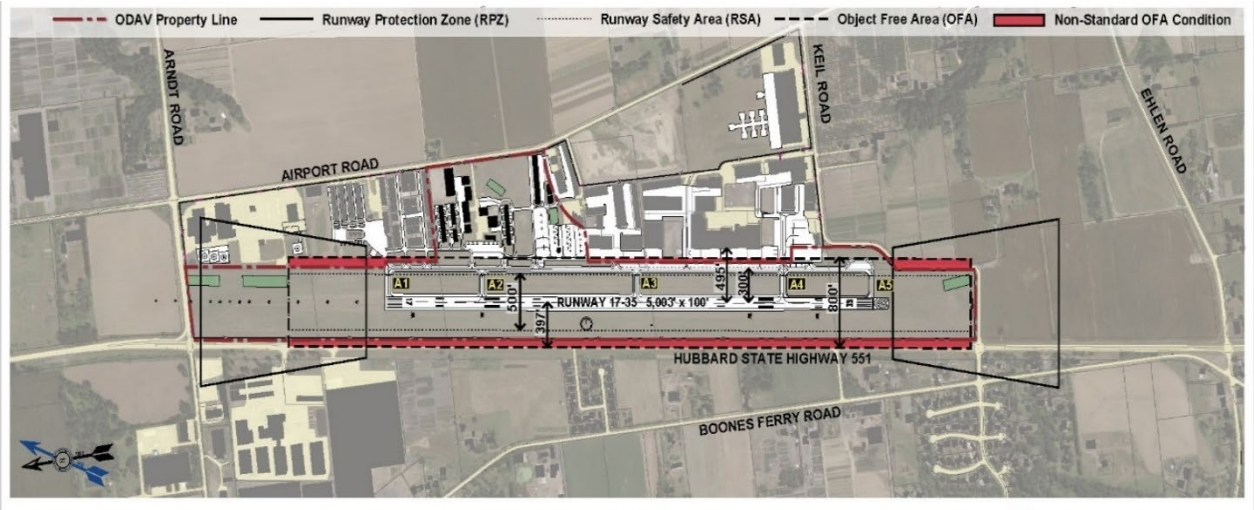
Based on Figure A-1 if the incident is Extremely Improbably (i.e. more than 100 years probability) the risk is considered “Low,” except for an incident considered catastrophic. We will use these graphs to evaluate the results from the detailed risk analysis of UAO below.

4. UAO ANALYSIS

In 2012 Master Plan and ALP established the UAO runway RDC, given existing based aircraft, as C-II, up from a B-II. The required ROFA width of a B-II runway is 500 feet centered on the runway. As it turns out, any runway of higher RDC than a B-II requires 800 feet in width. Thus, the UAO required C-II ROFA width is 800 feet centered on the runway. This 800-foot width is the standard used for aircraft ranging from a Challenger 300 business jet to the largest Boeing 777 or even the largest military aircraft. The 2012 approved ALP lists the ROFA deviation as a modification to standards, since the airport perimeter fence and Highway 551 were within the ROFA.

The UAO forecast of operations predicts that by the year 2041 there will be 90,230 annual operations at the airport, of which 862 would be an RDC above the B-II category. Thus, the 89,368 operations by B-II or lesser category clearly are operating well within ROFA safety standards, as the existing runway to road separations provide more than the 500-foot required width. It is just the 862 operations that need to be analyzed for ROFA safety relative to the required 800-foot width.

The deficiencies in the existing Runway OFA at UAO are shown in the Figure below:



UAO Figure A: Highway 551 Shown as ROFA Deviation Object
Source: Century West Engineers, Aurora State Airport Draft Airport Master Plan, Working Paper No. 1, Figure 2-15, November 2023 (Updated)

The current ROFA object deficiencies are:

d. Hubbard State Highway 551 for which the OFA penetrates 3 feet beyond the highway centerline. (368' to 377' clear width available from outer edge of highway gravel shoulder to Runway CL)
e. Perimeter Fence Inside OFA (312' clear width from Runway CL)

Potentially the airport fence could be relocated to the east edge of the 12-foot-wide gravel shoulder, since both the highway and the airport are owned by the State of Oregon. There can be an agreement between ODOT and ODAV to allow this. Relocating the fence in this way would result in a minimum width of the ROFA on the west side of the runway, to a 368-foot clearance - which would be only 32 feet out of conformance.

However, we will evaluate the ROFA for the existing conditions, and thus use the location of the airport perimeter fence as the maximum ROFA available at this time.

When analyzing the risk associated with a reduction in Runway OFA it is important to consider the purpose of the design standard. Paragraph 3.12 of Advisory Circular 150/5300-13B defines the ROFA but does not give detailed design rational behind the standard:

> *"ROFA is a clear area limited to equipment necessary for air and ground navigation, and provides wingtip protection in the event of an aircraft excursion from the runway"*

Appendix I, Paragraph I.8 of Advisory Circular 150/5300-13B provides the only available reference to the design rationale behind the Runway OFA width:

> *"The ROFA serves two principal purposes: 1. Development buffer in proximity to a runway, and 2. Wing clearance for a runway excursion event to the outer limit of the RSA. `*

Appendix I, in Section I.8.2, also clarifies that part of the "development buffer" intent is:

> *"Protection of the ROFA also reserves space for future development of a parallel taxiway that permits proper alignment of aircraft at a holding position on an entrance taxiway."*

However, for the given physical layout of UAO there can be no plan for a parallel taxiway on the west side of the runway, because of the location of Highway 551 and that there never can be hangars or other aviation uses on that side of the runway. Therefore, that leaves the only ROFA purpose for UAO as only "wingtip clearance for a runway excursion" which is precisely what this analysis provides.

Below we will analyze resolving the ROFA utilizing the risk analysis method of ACRP Report #51, for the case:

- No Change to existing ROFA conditions on West Side of Runway (Hwy 551 and Airport Perimeter Fence remain as existing) resulting in a 312-foot clearance to runway CL.

Per the methodology of ACRP Report 51, we analyze the risks for each of the takeoff and landing scenarios. For landing operations, the analysis is further divided into two parts: airborne (approach) phase and ground (landing rollout) phase. However, because the risk of veering off the runway during takeoff is so much less than for during landing, the methodology indicates that usually it is not necessary to evaluate takeoff option except if there are runways that only are used for takeoffs and not for landings. We will do that takeoff evaluation in any case, just to clearly determine what it is in the UAO context.

Since the existing runway to taxiway separation meets the current criteria for a C-II airport, for this study that analysis would seem unnecessary. However, we will include that option in this report because it provides a baseline of safety that the AC 150-5300-13B Airport Design Standards have determined is an acceptable and appropriate level of safety for a C-II airport.

Thus, for this UAO ROFA analysis separate risks are developed for each of:

1. Airborne Phase (Landing) is for instrument approaches which terminate the approach as a missed approach, and the risk is hitting another object such as hitting the airport perimeter fence or a vehicle on Highway 551 (using ACRP Report 51 Fig. 31); “the airborne risk is computed only for missed approaches” (ACRP Report 51, page 21).
2. Ground Phase (Landing Rollout) where risk is veering off the runway into the reduced width ROFA and hitting the fence or a car on Highway 551 (using ACRP Report 51 Fig 42). Figure 42 is based on the assumption that the risk is between the two wingtips of two aircraft, one aircraft on the edge of the runway and the other at the centerline of a taxiway. The ACRP makes clear that the x-axis distance on the Risk Figures are centerline of runway to centerline of taxiway because the risk is assumed aircraft to aircraft. However, the predicted risk is based on the wingtip-to-wingtip distance. When using the Risk Figures for objects (not aircraft) like a fence or road (which has no wings), half of the wingspan should be added to the distance to compensate for the wingtip-to-wingtip assumption. Thus, per Group II standards, the clearance distance used for Figure 42 should add half of 79 feet (equals 39.5 feet) of additional clearance, which would create a total of 351 feet to use in Fig. 42. The risk shown with the 312 feet and the 351 feet are each shown in figures.

3. Ground Phase (Takeoff) where risk is veering off the runway into the reduced width ROFA and hitting the fence or a car on Highway 551 (using ACRP Report 51 Fig 49).

Finally, to have more relevant data, we will also perform the risk analysis of the standard required 300-foot separation between runway centerline and taxiway centerline for a landing, which is the level of safety the AC 150/5300-13B sets for in a C-II airport:

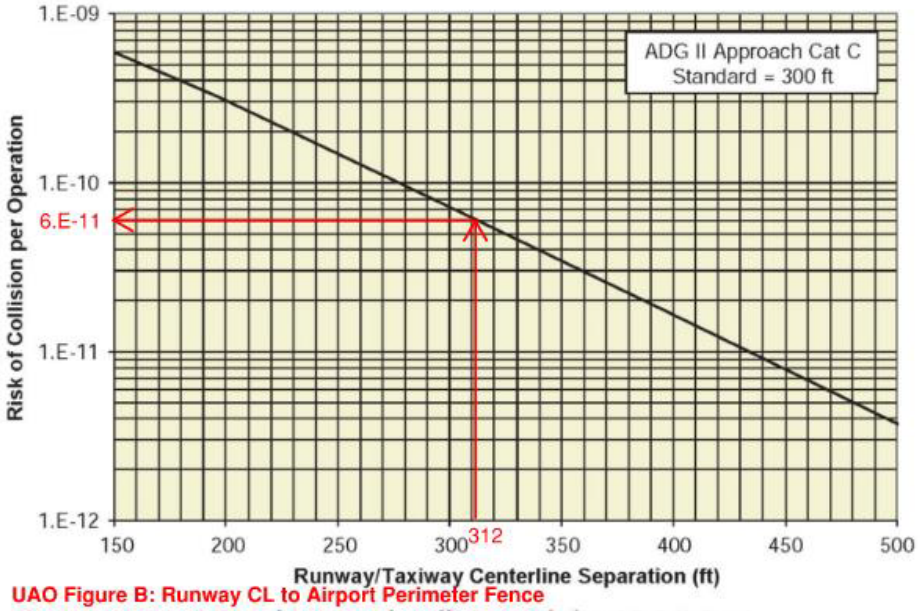
4. Ground Phase (Landing Rollout) where risk is veering off the runway into the taxiway (using ACRP Report 51 Fig 42).

This data will give us an example of an acceptable level of safety utilized in AC 150/5300-13B for a C-II airport.

5. Specific Analysis: Proposed MOS Option - No Change to Existing ROFA Conditions (312' Separation from Runway Centerline to Airport Fence)

The Perimeter Fence at the west side is located 312 feet from the runway centerline. The risks associated with leaving it there as a modification of standards, for each of the phases of flight are analyzed below:

1. Airborne Landing Phase Risk from Reduced ROFA – For a very conservative analysis we will assume that this includes all approach to landings, not just missed approaches. Using the separation of 312' and Figure AA-33 in Appendix A of ACRP Report #51, the following provides a risk level 6.0E-11 of occurrence per landing (which as an inverse, is one chance in a 16.7 trillion landings) that an aircraft gets 312' from the runway centerline. This can be seen in the figure below:

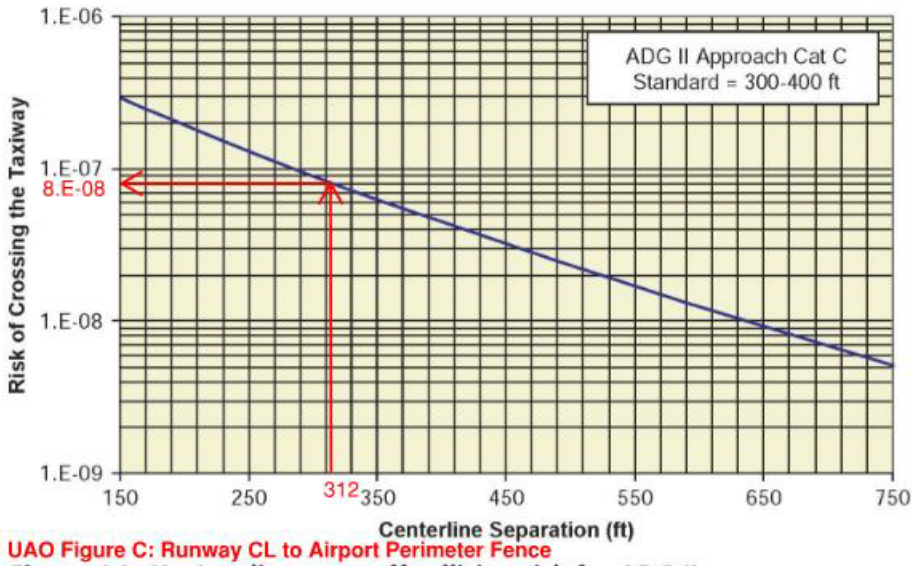


UAO Figure B: Runway CL to Airport Perimeter Fence

Figure AA-31. Missed approach collision risk for ADG II Cat I.

The current annual number of landing operations at UAO is approximately 45,115 or half of the 90,230 annual operations. As the risk is one incident in every 16.7 trillion landings, the time between occurrences is calculated as 16 trillion landings divided by 45,115 landing operations per year which equates to one incident every 369,000 years. Thus, this risk is of no significance.

2. Landing Roll Phase Risk for Reduced ROFA - Using the separation of 312' and Figure AA-43 in Appendix A of ACRP Report #51, provides a risk level 8.0E-08 or in the inverse: one chance in 12.5 million landings. This can be seen in the figure below:



UAO Figure C: Runway CL to Airport Perimeter Fence

Figure AA-42. Landing veer-off collision risk for ADG II.

As the risk is one incident in every 12.5 million landings, the rate of occurrence is calculated as 12.5 million landings divided by 45,115 landings per year which equates to one incident every 277 years.

Using the ACRP described adjustment when the object is not another aircraft and half the C-II wingspan can be added to the clearance distance, results in a separation of 351' and Figure AA-43 in Appendix A of ACRP Report #51, provides a risk level 6.0E-08 or one chance in 16.7 million landings. This can be seen in the figure below:

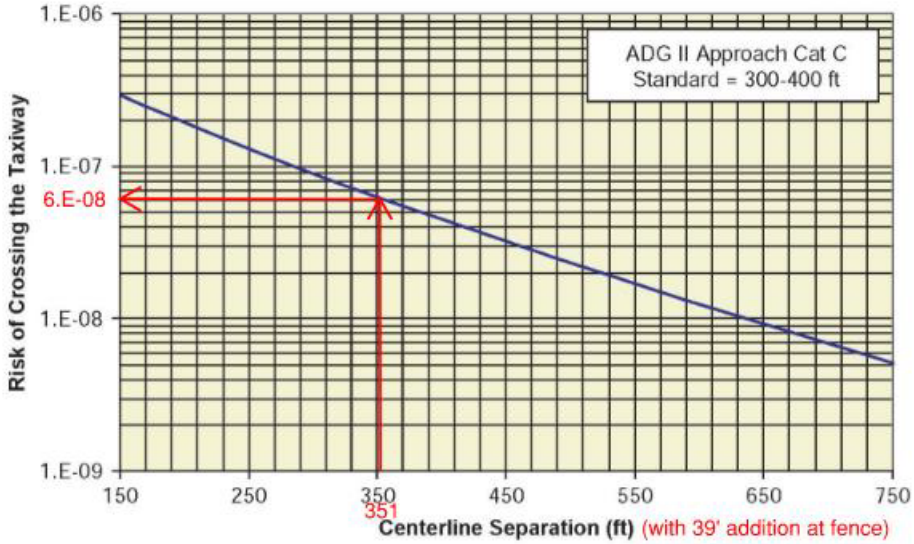
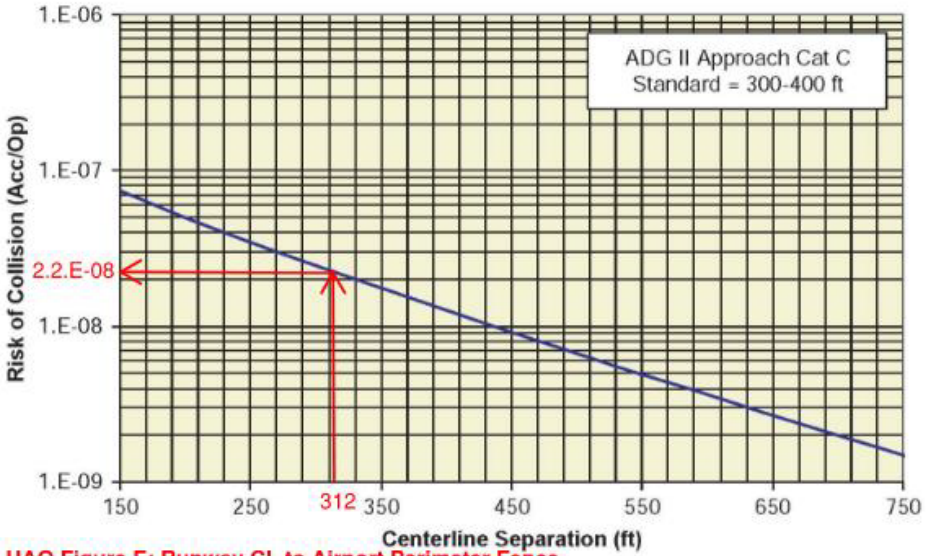


Figure AA-42. Landing veer-off collision risk for ADG II.
UAO Figure D: Runway CL to Airport Perimeter Fence Including Wingspan adjustment

As the risk is one incident in every 16.7 million landings, the rate of occurrence is calculated as 16.7 million landings divided by 45,115 landings per year which equates to one incident every 369 years.

3. Takeoff Roll Phase Risk for Reduced ROFA - Using the separation of 312' and Figure AA-49 in Appendix A of ACRP Report #51, provides a risk level 2.2E-08) or one chance in 45.5 million takeoffs. This can be seen in the figure below:

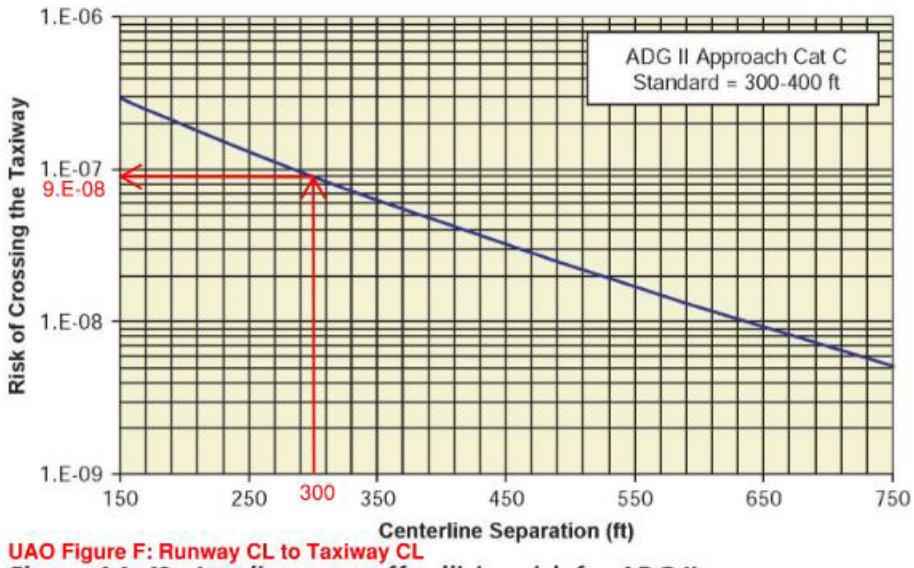


UAO Figure E: Runway CL to Airport Perimeter Fence
Figure AA-49. Takeoff veer-off collision risk for ADG II.

As the risk is one incident in every 45.5 million takeoffs, the rate of occurrence is calculated as 45.5 million takeoffs divided by 45,115 takeoffs per year which equates to one incident every 1,008) years.

Finally, as a test of the level of safety that AC 150/5300-13B considers acceptable we check what the predicted risk level is of the existing runway-taxiway separation considered appropriate[10] by FAA.

4. Landing Roll Phase Risk to Taxiway Consistent with Safety Standards of AC 150/5300-13B - Using the separation of 300' and Figure AA-43 in Appendix A of ACRP Report #51, provides a risk level 9.0E-08 or one chance in 11.1 million landings. This can be seen in the figure below:



UAO Figure F: Runway CL to Taxiway CL

Figure AA-42. Landing veer-off collision risk for ADG II.

As the risk is one incident in every 11.1 million landings, the rate of occurrence is calculated as 11.1 million landings divided by 45,115 landings per year which equates to one incident every 246 years.

[10] Note that Section 3-24 of Order 5100.38D Change 1 states that the FAA will not fund airport safety greater than that in the Airport Design standards, so the standard set by the runway-taxiway separation is a significant number. Order 5100.38D Change 1 can be downloaded for free at: https://www.faa.gov/documentLibrary/media/Order/AIP-Handbook-Order-5100-38D-Chg1.pdf

6. Conclusions

Considering the risk of each phase of flight, the risk of collision during the landing roll is the controlling factor. The Hazard Severity Classification for this type of operation would be major and the acceptable probability of occurrence is remote (1E-05) or less than once every 1-10 years. The following table summarizes the risk associated with each phase of flight:

Phase of Flight	Rate of Occurrence	Acceptable Level
Airborne Phase	Once every 369,000 years	Yes
Landing Roll Phase	Once every 277 years (or 369 years with calculation adjustment for fence object in lieu of wing object)	Yes
Takeoff Roll Phase	Once every 1,000 years	Yes

A runway to object separation of 312’ provides an acceptable level of safety as the controlling occurrence is once every 277 years (or 369 years with the adjustment for wingspan at the fence as allowed in the ACRP method). This is much less risk than the once per 100 years FAA standard shown in Table A-3 and results in a Category E “Extremely Improbable” occurrence. Further, per ACRP’s method, a wingtip to fence occurrence is considered by ACRP’s method to be a Table A-4 Minimal Severity occurrence. This combination via Figure A-1 concludes that the outcome as Low Risk.

Figure UAO F shows that the existing risk of occurrence between the existing runway and existing taxiway, which fully meets FAA standards, is one in every 246 years. This means that the risk to an occurrence at the taxiway, is much less (i.e. longer duration between events) than the FAA’s 100-year standard. The risk of collision with the perimeter fence is then even much less than that of a taxiway collision.

Finally, there is an incremental improvement option of ODAV and ODOT coming to an agreement to move the perimeter fence further west, to the east edge of the 12’ wide gravel shoulder, which would result in a 368-foot separation. If the 39.5-foot wing span correction is added at the new fence location, this results in an equivalent distance of 407 feet for use on Figure AA-42. That in turn would result in an ACRP predicted probability occurrence being once every 515 years, almost half the risk of a taxiway collision.

Given that the commercial use of aviation is itself only around 100 years old, these numbers of one predicted occurrence at the existing airport fence every 277 or 369 years, demonstrates the high level of safety that will be maintained at Aurora Airport with this MOS.

Given the regional and national importance of Aurora Airport for emergency medical, firefighting, and emergency power line moving, along with the use by local national corporations, using the MOS ensures the airport can continue to upgrade with safety improvements, and can continue to support the approximately 1,500 employees that rely on the airport for their livelihood.

This study shows definitively that the 2012 signing off on the Aurora Airport master plan and ALP with a modification of standards for the ROFA, by FAA and ODAV, was a reasonable and appropriate action to take. The same action should be taken for the current 2024 master plan work.

Author: Aron Faegre is an architect, civil engineer, physicist, and pilot who has been the lead planner and designer on over two hundred airport planning and development projects in Oregon, Washington, California, New York, and British Columbia over the past 35 years. He has a Master of Architecture from MIT and a Bachelor of Physics from Reed College.

ARON FAEGRE AND ASSOCIATES
AVIATION PLANNING AND DESIGN SERVICES FIRM PROFILE

Introduction

Aron Faegre and Associates is a multi-disciplinary firm with a special interest in performing planning and engineering for aviation projects. The principal of the firm, Aron Faegre, personally manages the firm's key projects and is an aviation planner, architect, civil engineer, and landscape architect. He is also an instrument rated commercial pilot.

Mr. Faegre's firm has completed aviation projects for the following clients:

- Oregon Department of Aviation
- Port of Walla Walla
- Quinault Indian Nation
- Horizon Air
- Southwest Airlines
- Columbia Helicopters
- Helicopter Transport Services
- Oregon Health Sciences University
- Kaiser Hospital
- Atlantic Aviation
- The Port of Portland
- Port of Columbia County Scappoose)
- The City of Portland
- City of Pendleton
- Washington State DOT
- Life Flight Network
- Van's Aircraft
- City of Newberg
- Transwestern Aviation
- Flightcraft PDX

Aviation Services

Aron Faegre & Associates provides consulting services on all aspects of aviation facilities design including:

- Airport Master Plans
- Maintenance Hangars and Shops
- Storage Hangars
- Terminals and Concourses
- Airport Layout Plans
- Runway Design
- Access Road Design
- Instrument Approach Drawings
- Apron Design
- Airport Economic Impact
- Noise Abatement Planning
- Environmental Assessment
- Fixed Base Operator Facilities
- Air Cargo Facilities
- Tenant Fit-up
- Obstruction Survey
- Taxiway Design
- Airport Security Design
- Aviation Land Use Planning
- Public-Private Partnerships

Aron Faegre, P.E, AIA is the principal of AFA, a multi-disciplinary planning and design firm. Mr. Faegre has a Master's Degree in Architecture from the Massachusetts Institute of Technology, during which he was also a National Science Foundation Fellow for three years. Mr. Faegre has a Bachelor's Degree in Physics from Reed College and has published research in scientific journals. He is licensed as a civil engineer, architect, and landscape architect. He is a commercial pilot with instrument rating. He also serves on the board of the Airway Science for Kids, an Oregon non-profit, where he also leads the TeenFlight program – where teams of 15 teenagers build an RV-12is aircraft, and then get to experience flying the airplane they built.

Outlook

Fw: Opposition to taking of drain-field

From Brandy Steffen <brandy.steffen@jla.us.com>
Date Mon 2025-01-06 8:52 AM
To Jen Winslow <Jen.winslow@jla.us.com>; Ashley Balsom <ashley.balsom@jla.us.com>

3 attachments (8 MB)

Aurora State Airport Utitlty Easement (rec'd) 4823-5868-1777 1.pdf; Aurora State Airport Non-Commercial Site Lease (exec'd) 4828-2404-6256 2.docx; 2023 HDSE to ODAV notify renew rev 1.docx;

BRANDY STEFFEN | **JLA PUBLIC INVOLVEMENT**
Senior Program Manager + Partner
She/Her » Why pronouns matter
brandy.steffen@jla.us.com » Office 503-235-5881 » jla.us.com
Meeting + email hours 9 a.m.–5 p.m. Monday–Thursday » Administrative-only hours Friday
Check my availability » Schedule a 30 minute check-in

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Please note: I will be on vacation, without access to my email, starting Friday, 01/24/25 and returning Monday, 02/03/25.

From: THOMAS Alex R <Alex.R.THOMAS@odav.oregon.gov>
Sent: Monday, December 23, 2024 3:48 PM
To: Brandy Steffen <brandy.steffen@jla.us.com>; Samantha Peterson <SPeterson@CenturyWest.com>; BEACH Anthony <Anthony.BEACH@odav.oregon.gov>
Subject: FW: Opposition to taking of drain-field

Hello,

Good afternoon. Please include within the UAO record.

ALEX THOMAS
OREGON DEPARTMENT OF AVIATION (ODAV)
POLICY, PLANNING, & PROGRAMS MANAGER

CELL 971-375-2357
EMAIL Alex.R.Thomas@ODAV.Oregon.Gov
SALEM, OR 97302
WWW.OREGON.GOV/AVIATION

Schedule a meeting with me.

Schedule a meeting with any of the programs listed below.

Alternative Contacts:
COAR Grants: Grants@ODAV.Oregon.Gov
Procurement / Contracts: Contracts@ODAV.Oregon.Gov
Pavement (PEP/PMP): Pavement@ODAV.Oregon.Gov
Land Use / Tall Structure: LandUse@ODAV.Oregon.Gov

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From: Helbling, Tony <helbling@wilsonconst.com>
Date: Monday, December 23, 2024 at 14:57
To: THOMAS Alex R <Alex.R.THOMAS@odav.oregon.gov>
Cc: Doris Gulden <manager@secapcoa.com>
Subject: Opposition to taking of drain-field

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December 23, 2024

Alex Thomas
Planning and Programs Manager
Oregon Department of Aviation
3040 25th St SE
Salem, OR 97602
Alex.R.Thomas@odav.oregon.gov

Re: Opposition Removal of HDSE Drain-field

Mr. Thomas,

Please enter into the record my fervent opposition to the proposed “Preferred Alternative” for the Aurora State Airport Master Plan, currently in development, to include and especially, opposition to the removal of HDSE’s Drain-field.

This alternative is diametrically opposed to Oregon Revised Statute 836.642, promoting development at Oregon’s rural airports, specifically in this case, Aurora State Airport. The plan calls for the destruction of many jobs and the taking of private property due to misguided planning, not required by the Federal Aviation Administration.

Private investors brought development and jobs to the airport at the invitation of the State of Oregon, now to be told the investment is not worthy of protection by the very agency charged to do so in the statute. Furthermore, the agency plans to destroy this investment while openly declaring the intent to

build new hangars in their places and then commercially lease those properties. This plan is as unfathomable as it is immoral.

Many of these properties are served by HDSE's state-of-the-art septic system which includes a drain field on the south end of the runway. The drain-field was installed with the knowledge and approval of ODAV and the FAA. HDSE has an easement in perpetuity as well as a valid lease that is in it's first of two, five-year extensions which began in August of 2024. (See Attached)

It is clear to us a different approach could achieve the much-needed safety improvement of a runway extension as was admitted to by the FAA's Tim House during the last Public Advisory Committee meeting. This approach would show progress toward C-II compliance rather than an "all or nothing" approach as called for in the proposed Preferred Alternative. This approach could include the modification of the drain-field to be brought into compliance with FAA standards for an allowed "utility" within the Runway Safety Area.

We are specifically asking for ODAV and its consultants to tap the brakes on this process so that a public, face-to-face, work-session type meeting could be held with all the PAC members, ODAV staff, their consultants as well as the FAA, and be open to the public. At this meeting, we could JOINTLY and FREELY discuss ideas and options with a common goal of developing a plan that does not destroy jobs and private property investment. We could work together in the spirit of ORS 836.642, 3(e) "… protect investment" rather than destroy it.

Sincerely,

Tony Helbling
President
HDSE Board of Directors

CC: File/Doris Gulden

Outlook

Fw: Enter into the MP record

From Brandy Steffen <brandy.steffen@jla.us.com>
Date Mon 2025-01-06 8:52 AM
To Ashley Balsom <ashley.balsom@jla.us.com>; Jen Winslow <Jen.winslow@jla.us.com>

BRANDY STEFFEN | **JLA PUBLIC INVOLVEMENT**
Senior Program Manager + Partner
She/Her » Why pronouns matter
brandy.steffen@jla.us.com » Office 503-235-5881 » jla.us.com
Meeting + email hours 9 a.m.–5 p.m. Monday–Thursday » Administrative-only hours Friday
Check my availability » Schedule a 30 minute check-in

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Please note: I will be on vacation, without access to my email, starting Friday, 01/24/25 and returning Monday, 02/03/25.

From: THOMAS Alex R <Alex.R.THOMAS@odav.oregon.gov>
Sent: Monday, December 23, 2024 3:21 PM
To: Brandy Steffen <brandy.steffen@jla.us.com>; Samantha Peterson <SPeterson@CenturyWest.com>; BEACH Anthony <Anthony.BEACH@odav.oregon.gov>
Subject: FW: Enter into the MP record

Hello,

Good afternoon. Please include within the UAO record.

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OREGON DEPARTMENT OF AVIATION (ODAV)
POLICY, PLANNING, & PROGRAMS MANAGER

CELL 971-375-2357

EMAIL Alex.R.Thomas@ODAV.Oregon.Gov

SALEM, OR 97302

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From: Helbling, Tony <helbling@wilsonconst.com>
Date: Monday, December 23, 2024 at 14:27
To: THOMAS Alex R <Alex.R.THOMAS@odav.oregon.gov>, Brandy Steffen <brandy.steffen@jla.us.com>
Subject: Enter into the MP record

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December 23, 2024

Alex Thomas
Planning and Programs Manager
Oregon Department of Aviation
3040 25th Ste SE
Salem, OR 97602
Alex.R.Thomas@odav.oregon.gov

Re: Aurora State Airport Master Plan Proposed Preferred Alternative

Mr. Thomas,

Please enter this letter into the record for the Oregon Department of Aviation's (ODAV) proposed "Preferred Alternative" for the Aurora State Airport Master Plan. We support Director Sugahara's statement that ODAV is willing to modify its Preferred Alternative for the Aurora Airport Master Plan. We believe that it is important that ODAV do so, to enable the airport to continue to deliver significant tax benefits, family wage jobs, emergency resiliency and aeronautical innovation to the region and state. The current version of ODAV's proposed Preferred Alternative is inconsistent with these objectives.

ODAV is bound by ORS 836.640-642 which was developed by Business Oregon. That statute strongly encourages private investment at the Aurora Airport and commands ODAV to carry out that objective. Contrary to that statute, ODAV's proposed alternative contemplates ODAV taking by eminent domain the Aurora Airport front line aircraft hangars for which the owners have invested more than $200 million, created millions in tax revenue, more than 1000 good jobs and millions in directly and indirectly related tourist revenue for surrounding communities, with ORS 836.640-642 as the catalyst.

Against this backdrop, the "Preferred Alternative" anomalously designates areas that have been set aside in airport master plans for airport related development since 1976, as areas for ODAV acquisition instead of bringing them into the airport boundary established by ORS 836.640-642 for development for airport related uses and wipes out the front line hangars.

Both elements of the preferred alternative are misguided. Among other objectives for the Aurora Airport, ORS 836.642 requires ODAV to "Preserve investments [at the Aurora Airport] and the level of service provided by [the Aurora Airport]" and to "promote economic development" at Aurora "by creating family wage jobs, increasing local tax bases" through support of private aviation-related uses so that they may "develop and thrive." The preferred alternative is contrary to ORS 836.640-642 and expressly seeks to trade the private investment that the statute seeks to encourage and grow, for government condemnation and ownership.

Concerningly, ODAV's preferred alternative significantly gambles with the significant economic benefits that private investment at the airport has delivered, risking their continuation. The threat of ODAV condemnation, not to mention ODAV actually engaging in such litigation against those owners, presents an unacceptable risk of driving away not only those aircraft hangar owners, but also their businesses, jobs and related tax and tourist revenue. Once they are gone, the stigma of such ODAV action could make the airport and indeed any airport that ODAV manages, a private investment pariah for decades. Such a risk should not be taken where, as here, a state statute commands ODAV otherwise and there are alternatives.

It is respectfully submitted that the justification for the "preferred alternative" simply does not justify its deleterious effects. ODAV is on record stating that these harmful consequences only flow from ODAV's desire for a "vehicle service road" (VSR) and a new aircraft taxiway. But neither necessitates the preferred alternative.

Regarding the VSR, the 2012 master plan approved a VSR that has none of the Preferred Alternative's deleterious effects and does not carry a $200 million condemnation price tag. At worst, the 2012 VSR costs the state some pavement. Moreover, we are advised that the private aeronautical stakeholder owners have offered ODAV the land needed for the 2012 MP VSR free of charge. I am unaware of any reason for ODAV to not pursue that 2012 MP VSR and we can only see good reasons to do so.

I am further advised that there are alternatives for a new taxiway that ODAV has not explored. I understand that ODAV has not explored any such alternatives because it does not own the land needed for a taxiway to be located elsewhere. However, so far as I know this has never been an impediment previously to the development of the Aurora Airport and should not be an impediment now. Many features of the proposed alternative are now contemplated on land that ODAV does not own – including the taking of the frontline hangars. Even if ODAV had to acquire some private land for a new taxiway, ODAV should explore such alternatives having the least adverse impact on the continuation and growth of private aeronautical investment at the airport, not to mention a price tag well south of the $200 million under the Preferred Alternative. Finally, I am advised that ODAV simply does not "want" to extend the airport boundary to include the land that is now and has long been foreseen for airport-related development in the airport boundary. Such a justification if true, would obviously be contrary to ODAV's mission and responsibility to enable the Aurora Airport to grow with aviation-related uses.

I am frankly perplexed by these problems given the success of the airport and the commands of ORS 836.640-642. ODAV should be eager to develop a master plan that ensures the Aurora Airport's continued growth and success over the master plan's 20-year horizon. If these problems that risk sending the airport backwards by decades arise from a lack of meaningful airport stakeholder engagement in the development of the preferred alternative, then ODAV should meaningfully engage. But whatever the reason, we strongly encourage ODAV to dismiss the Preferred Alternative and to meet with the airport stakeholders and to explore a more normative and economically reasonable preferred alternative that is consistent with ORS 836.640-642.

Sincerely,

Tony Helbling
Logistics Manager
Wilson Construction Company
1190 NW 3rd Ave
Canby, OR 97013
Cell: 503-519-6059
Office: 503-263-6882
helbling@wilsonconst.com

041W11A00500

AFTER RECORDING, RETURN TO:
Oregon Department of Aviation
3040 25th Street SE
Salem, OR 97302

REEL 4288 PAGE 75
MARION COUNTY
BILL BURGESS, COUNTY CLERK
01-13-2020 01:28 pm.
Control Number 584372 $ 126.00
Instrument 2020 00001957

AURORA STATE AIRPORT
UTILITY EASEMENT

This utility easement agreement ("**Easement**") made and amended effective the 1st day of September, 2019, by and between **THE STATE OF OREGON** by and through the **OREGON DEPARTMENT OF AVIATION**, **Grantor**, and **HDSE SEWER SYSTEM OWNERS ASSOCIATION**, an Oregon nonprofit corporation, **Grantee** or the "**Association**" hereunder.

RECITALS

A. Grantor is the owner of the real property in Marion County, Oregon legally described in the attached Exhibit A (the "**Airport Property**"), which is commonly known as the Aurora State Airport in Marion County, Oregon.

B. Grantee is a sewer system association established pursuant to that Declaration of Protective Covenants, Conditions, Restrictions and Easements for the HDSE Sewer System records at Reel 2577 Page 69 of the Records of Marion County, Oregon, with sewer facilities located on a portion of the common element property of the Southend Corporate Airpark Condominium located adjacent to the Airport Property as well as other nearby private property, and which system serves property owned by members of the Association.

C. Grantee pays rent over the portion of the Airport Property that is the Easement Area (as defined below) pursuant to a lease of the Easement Area from Grantor, which rent is also consideration for this Easement, the sufficiency of which Grantor acknowledges.

GRANT OF EASEMENT

The Grantor does hereby grant and convey to the Grantee, its heirs, successors and assigns, (i) a nonexclusive, perpetual easement on, over, under and through the portion of the Airport Property that is legally described and depicted in Exhibit B, being the areas marked "Drainfield" and "Reserve Area" in the attached Exhibit B, and under sufficient area between the Drainfield area and Reserve Area for piping in its existing location and (together, the "**Easement Area**"), for the construction, operation, testing, maintenance, use and repair of an individual water-carried on-site sewage disposal system (the "**Drainfield**"), which easement is in gross and personal to Grantee and for the benefit of the members of Grantee, together with (ii) a nonexclusive, perpetual easement on, over and through

041W11A00500

AFTER RECORDING, RETURN TO:
Oregon Department of Aviation
3040 25th Street SE
Salem, OR 97302

AURORA STATE AIRPORT
UTILITY EASEMENT

This utility easement agreement ("**Easement**") made and amended effective the 1st day of September, 2019, by and between **THE STATE OF OREGON** by and through the **OREGON DEPARTMENT OF AVIATION**, **Grantor**, and **HDSE SEWER SYSTEM OWNERS ASSOCIATION**, an Oregon nonprofit corporation, **Grantee** or the "**Association**" hereunder.

RECITALS

A. Grantor is the owner of the real property in Marion County, Oregon legally described in the attached Exhibit A (the "**Airport Property**"), which is commonly known as the Aurora State Airport in Marion County, Oregon.

B. Grantee is a sewer system association established pursuant to that Declaration of Protective Covenants, Conditions, Restrictions and Easements for the HDSE Sewer System records at Reel 2577 Page 69 of the Records of Marion County, Oregon, with sewer facilities located on a portion of the common element property of the Southend Corporate Airpark Condominium located adjacent to the Airport Property as well as other nearby private property, and which system serves property owned by members of the Association.

C. Grantee pays rent over the portion of the Airport Property that is the Easement Area (as defined below) pursuant to a lease of the Easement Area from Grantor, which rent is also consideration for this Easement, the sufficiency of which Grantor acknowledges.

GRANT OF EASEMENT

The Grantor does hereby grant and convey to the Grantee, its heirs, successors and assigns, (i) a nonexclusive, perpetual easement on, over, under and through the portion of the Airport Property that is legally described and depicted in Exhibit B, being the areas marked "Drainfield" and "Reserve Area" in the attached Exhibit B, and under sufficient area between the Drainfield area and Reserve Area for piping in its existing location and (together, the "**Easement Area**"), for the construction, operation, testing, maintenance, use and repair of an individual water-carried on-site sewage disposal system (the "**Drainfield**"), which easement is in gross and personal to Grantee and for the benefit of the members of Grantee, together with (ii) a nonexclusive, perpetual easement on, over and through

the Airport Property as necessary for access to the Easement Area for the permitted uses granted herein.

TERMS AND CONDITIONS

This agreement is subject to the following terms and conditions:

1. The easement described herein grants to the Grantee, and to its successors, assigns, authorized agents or contractors, the right to enter the Easement Area for operation, testing, construction, maintenance, evaluation and repair and replacement of the Drainfield. Grantee must provide reasonable advance notification to Grantor before entry onto the Airport Property to exercise Grantee's rights under this Easement Agreement, by calling contact telephone numbers:

a. State Airports Manager (503) 378-2523

b. State Airports Operation Specialist (503) 378-2521

The above contact information may be changed at any time by Grantor notifying Grantee of such, it being understood and agreed that the contact information shown above, and any revisions of the information, will be effective for notification to Grantor under this Easement Agreement at any time.

2. Grantee is responsible for obtaining all required permits and for payment of all associated fees in respect of the Drainfield. All facilities constructed after the date of this Easement A
vgreement will have to be placed to the depth below ground surface specified in approved Oregon Department of Environmental ("**DEQ**") permits for such installations in the Easement Area.

3. The Grantee is responsible for any needed repair or replacement of the Drainfield and for damage to said Easement Area by reason of any negligence, act or omission on the part of Grantee, its contractors, agents, members, directors, or officers.

4. Upon performing any construction, repair or maintenance in the Easement Area, Grantee will make reasonable efforts to return the site to its original or better condition.

5. No structure other than existing above-ground facilities and future above-ground facilities constructed or installed in accordance with approved DEQ permits for the Drainfield may be constructed on the Easement Area. This Easement Agreement does not grant or convey to the Grantee any right or title to the surface of the soil or land of the Easement Area or the Airport Property, other than expressly stated herein. Due to the Drainfield being located on the Aurora State Airport, any new construction that exceeds the upward elevation of ground level must be constructed in accordance with Oregon Administrative Rule Chapter 738, Division 70.

6. Grantor will have the right to use the Easement Area so long as its use does not unreasonably interfere with Grantee's permitted use and is not detrimental to the Drainfield system or contrary to laws and rules of governmental agencies applicable or related to the Drainfield system. Grantee will maintain in force during the duration of the Easement, liability insurance covering the operations of Grantee while accessing the Airport Property as permitted under this Easement

Agreement. Grantee will also conducts its activities under this Easement Agreement at Grantee's own risk, and will hold harmless and indemnify the State of Oregon, Department of Aviation, its agents, officers and employees form all damages, demands, suits or actions whatsoever resulting from or because of, any damage to property, injury, or death to or of any person(s) arising out of Grantee's negligent construction, operation, maintenance, repair, alteration, operation, control or use of the Easement Area and the Drainfield and access thereto over the Airport Property.

7. When Grantee no longer uses the Easement for the purposes described herein, it is the responsibility of the Grantee to notify Grantor of its intent to terminate this Easement and to record a termination of this Agreement in the Records of Marion County, Oregon. It is understood and agreed that upon such termination Grantor may require Grantee to remove from the Easement Area all of its facilities authorized hereunder. If Grantor so elects, Grantor shall provide notice thereof, and Grantee shall, at its own expense and within a reasonable time following receipt of written notification thereof from Grantor remove all such facilities.

IN WITNESS WHEREOF, the Grantor of this Easement Agreement has fixed its hand and seal the day and year first above written. As a state agency, it has caused its name to be signed and its seal, if any, affixed by an officer or other persons duly authorized to do so by designated authority of the Oregon Department of Aviation by duly adopted Sub delegation Order No SUB-16, dated March 18, 1999.

GRANTOR

THE STATE OF OREGON, by and through the Oregon Department of Aviation

By: _____

Name: Matthew Maass

Title: State Airports Manager

STATE OF OREGON)
)
COUNTY OF MARION)

The foregoing instrument was acknowledged before me this 10th day of December 2019 by Matthew Maass, State Airports Manager for the State of Oregon by and through the Oregon Department, on its behalf.

_____

Notary Public for Oregon

My commission expires: 3/28/21

Commission No.: 960638

OFFICIAL STAMP
ROGER DENNIS SPONSELLER
NOTARY PUBLIC-OREGON
COMMISSION NO. 960638
MY COMMISSION EXPIRES: MARCH 28, 2021

GRANTEE:

HDSE SEWER SYSTEM OWNERS ASSOCIATION,
an Oregon nonprofit corporation

By: _____
Ted L. Millar, Chairperson

By: _____
Joseph Montesano, Secretary

STATE OF NEVADA)
) ss.
County of Clark)

The foregoing instrument was acknowledged before me this 18th day of December 2019 by Ted L. Millar, Chairperson of HDSE Sewer System Owners Association, an Oregon nonprofit corporation, on its behalf.

RICHARD JAMES RYAN
NOTARY PUBLIC
STATE OF NEVADA
My Commission Expires: 05-14-2023
Certificate No: 19-2576-1

_____
Notary Public for Nevada
My commission expires: 05-14-2023
Commission No.: 19-2576-1

STATE OF OREGON)
) ss.
County of Marion)

The foregoing instrument was acknowledged before me this 19 day of December 2019 by Joseph Montesano, Secretary of HDSE Sewer System Owners Association, an Oregon nonprofit corporation, on its behalf.

OFFICIAL STAMP
JENNIFER LYNN BALDWIN
NOTARY PUBLIC - OREGON
COMMISSION NO. 962538
MY COMMISSION EXPIRES JUNE 01, 2021

_____
Notary Public for Oregon
My commission expires: June 01 2021
Commission No.: 962538

EXHIBIT A

Airport Property Legal Description

The State of Oregon, by and through its Department of Transportation, Aeronautics Section, holds fee title to the following described property lying in the East ½ of Section 2 and the Northeast ¼ and the Northwest ¼ of the Southeast ¼ of Section 11, Township 4 South, Range 1 West of the Willamette Meridian, Marion County, Oregon and being more particularly described as follows:

Beginning at a point which is West 616 feet and South 07°08' West 30 feet from the Northeast comer of said Section 2; thence South 07°08' West 2668.5 feet; thence North 89°53'15" East 921.88 feet to the Westerly right-of-way line of Market Road No. 59; thence along said right-of-way South 00°09' East 1075.76 feet; thence continuing along said right-of-way line Southerly along the arc of a curve to the left 116.98 feet to an iron rod at the end of said curve, said curve having a radius of 602.96 feet and a radial bearing of North 78°44'04" East from said iron rod; thence leaving said right-of-way South 86°32'29" West 91.62 feet; thence Westerly along the arc of a curve to the left 129.85 feet to an iron rod, said curve having a radius of 930 feet and a central angle of 08°00'00"; thence South 78°32'29" West 176.39 feet to an iron rod at the beginning of a curve to the left, said curve having a radius of 530 feet; thence Southwesterly along said curve 475.14 feet to an iron rod, the radial bearing of said curve is South 62°49'24" East from said iron rod; thence leaving said curve South 89°53'15" West 366.87 feet; thence South 07°08'00" West 2019.6 feet to an iron rod; thence South 82°51'13" East 200 feet to an iron rod; thence South 07°08'47" West 385.30 feet to an iron rod; thence South 89°48'48" West 7.72 feet; thence South 0°11'12" East 60 feet; thence South 07°08'00" West 418.42 feet; thence on the arc of a 170 foot radius curve to the right 133.52 feet, the chord of said curve bears South 29°38'00" West and measures 130.11 feet; thence South 52°08'00" West 66.18 feet; thence West 43.75 feet; thence North 82°52'00" West 60 feet; thence South 07°08'00" West 910.18 feet to an iron rod; thence North 82°52'09" West 600.08 feet to an iron rod; thence North 07°08'00" East 8126.48 feet to the Southerly right-of-way line of County Road No. 428; thence East 619.3 feet along said Southerly right-of-way line to the point of beginning.

EXHIBIT B
Depiction of Easement Area

CHASE, JONES & ASSOCIATES INC.
FORMERLY BOOTH & WRIGHT
LAND SURVEYORS & ENGINEERS SINCE 1885
716 SE 11TH AVENUE PORTLAND, OR 97214
PHONE: (503) 228-9844

Date: October 24, 2019
Project No.: 15559

Drain Field Easement

A portion of the property of State of Oregon, Department of Aviation, as described in Exhibit "A" of the "Aurora State Airport Utility Easement" recorded April 20, 2005, in reel 2467 at page 278 of Marion County Records, situate in the East Half of Section 11, Township 4 South, Range 1 West, Willamette Meridian, in the County of Marion, State of Oregon, being described as follows:

COMMENCING at the Southwest corner of said Department of Aviation property; thence South 82°52'09" East 458.64 feet; thence North 02°48'30" East 50.00 feet to the **POINT OF BEGINNING** of the herein described Drain Field Easement; thence North 02°48'30" East 131.50 feet; thence North 04°32'50" West 138.00 feet; thence South 88°05'20" East 87.00 feet; thence South 04°32'50" East 138.00 feet; thence South 02°48'30" West 131.50 feet; thence North 88°05'20" West 87.00 feet to the **POINT OF BEGINNING**.

The above described Drain Field Easement contains 23,370 square feet, more or less.

The basis of bearing for this Easement is South 82°52'09" East along the South line of the "State of Oregon Aeronautics Division" Property shown on the Lot Line Adjustment filed in the Marion County Survey Records as survey number 32463-A.

REGISTERED
PROFESSIONAL
LAND SURVEYOR

Eric D. Jones

OREGON
JULY 16, 1982
ERRIC D. JONES
1996

EXPIRES: 6-30-21

CHASE, JONES & ASSOCIATES INC.
FORMERLY BOOTH & WRIGHT
LAND SURVEYORS & ENGINEERS SINCE 1885
716 SE 11TH AVENUE PORTLAND, OR 97214
PHONE: (503) 228-9844

Date: October 24, 2019
Project No.: 15559

Reserve Easement

A portion of the property of State of Oregon, Department of Aviation, as described in Exhibit "A" of the "Aurora State Airport Utility Easement" recorded April 20, 2005, in reel 2467 at page 278 of Marion County Records, situate in the East Half of Section 11, Township 4 South, Range 1 West, Willamette Meridian, in the County of Marion, State of Oregon, being described as follows:

COMMENCING at the Southwest corner of said Department of Aviation property; thence South 82°52'09" East 89.31 feet; thence North 00°45'00" East 80.00 feet to the **POINT OF BEGINNING** of the herein described Reserve Easement; thence North 00°45'00" East 227.14 feet; thence South 86°35'00" East 103.00 feet; thence South 00°45'00" West 227.14 feet; thence North 86°35'00" West 103.00 feet to the **POINT OF BEGINNING**.

The above described Reserve Easement contains 23,370 square feet, more or less.

The basis of bearing for this Easement is South 82°52'09" East along the South line of the "State of Oregon Aeronautics Division" Property shown on the Lot Line Adjustment filed in the Marion County Survey Records as survey number 32463-A.

REGISTERED
PROFESSIONAL
LAND SURVEYOR

Eric D. Jones

OREGON
JULY 16, 1982
ERRIC D. JONES
1996

EXPIRES: 6-30-21

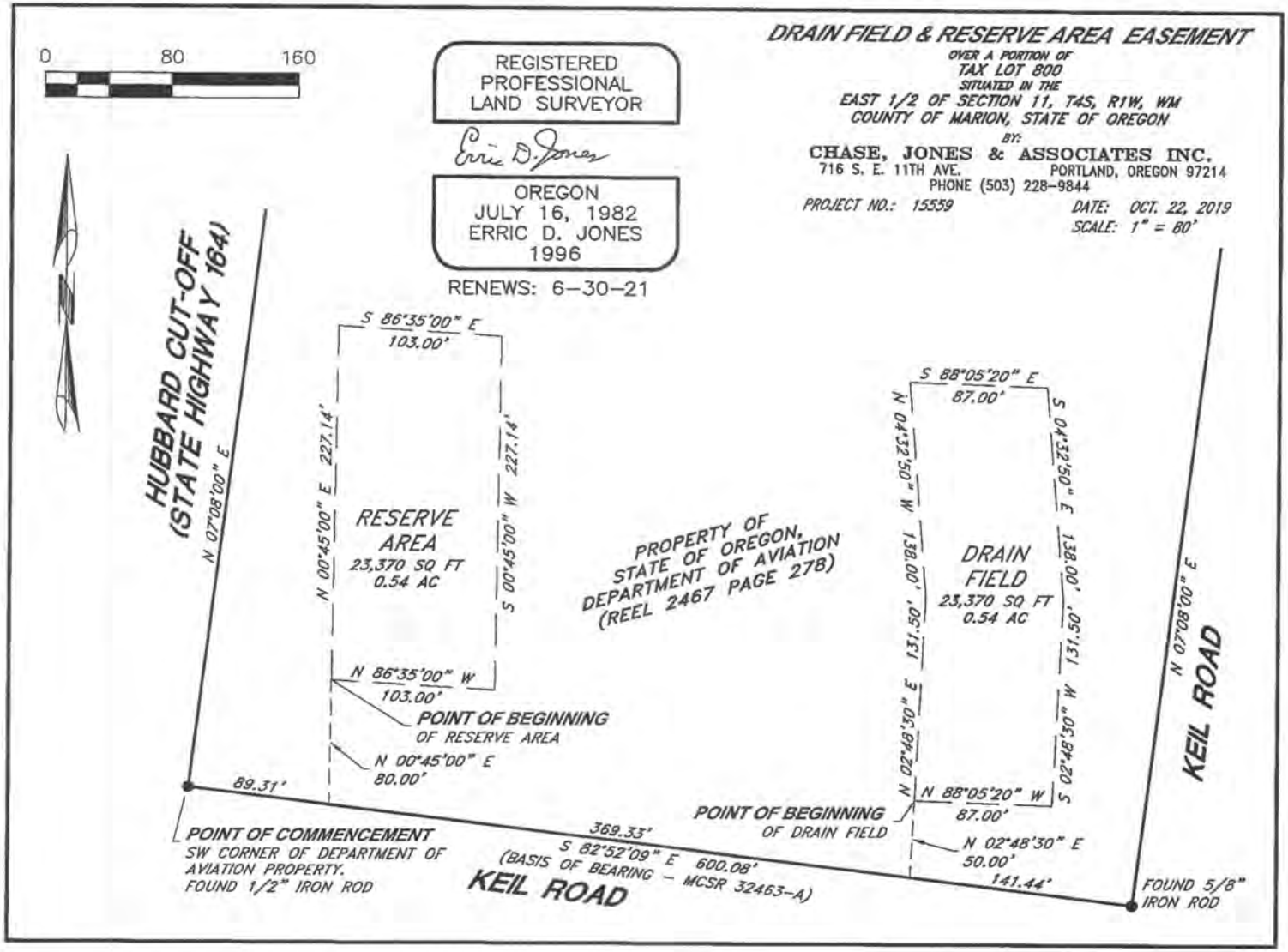

DRAIN FIELD & RESERVE AREA EASEMENT
OVER A PORTION OF
TAX LOT 800
SITUATED IN THE
EAST 1/2 OF SECTION 11, T4S, R1W, WM
COUNTY OF MARION, STATE OF OREGON
BY:
CHASE, JONES & ASSOCIATES INC.
716 S. E. 11TH AVE. PORTLAND, OREGON 97214
PHONE (503) 228-9844
PROJECT NO.: 15559
DATE: OCT. 22, 2019
SCALE: 1" = 80'
0
80
160
REGISTERED
PROFESSIONAL
LAND SURVEYOR
OREGON
JULY 16, 1982
ERRIC D. JONES
1996
RENEWS: 6-30-21
HUBBARD CUT-OFF
(STATE HIGHWAY 164)
N 07°08'00" E
S 86°35'00" E
103.00'
N 00°45'00" E 227.14'
S 00°45'00" W 227.14'
RESERVE
AREA
23,370 SQ FT
0.54 AC
N 86°35'00" W
103.00'
POINT OF BEGINNING
OF RESERVE AREA
N 00°45'00" E
80.00'
89.31'
POINT OF COMMENCEMENT
SW CORNER OF DEPARTMENT OF
AVIATION PROPERTY.
FOUND 1/2" IRON ROD
369.33'
S 82°52'09" E 600.08'
(BASIS OF BEARING - MCSR 32463-A)
KEIL ROAD
PROPERTY OF
STATE OF OREGON,
DEPARTMENT OF AVIATION
(REEL 2467 PAGE 278)
S 88°05'20" E
87.00'
N 04°32'50" W 138.00'
S 04°32'50" E 138.00'
131.50'
131.50'
N 02°48'30" E
S 02°48'30" W
DRAIN
FIELD
23,370 SQ FT
0.54 AC
N 88°05'20" W
87.00'
POINT OF BEGINNING
OF DRAIN FIELD
N 02°48'30" E
50.00'
141.44'
N 07°08'00" E
KEIL ROAD
FOUND 5/8"
IRON ROD

Exhibit B

STATE OF OREGON

AURORA STATE AIRPORT

NON-COMMERCIAL SITE LEASE

This **NON-COMMERCIAL SITE LEASE ("Lease")** is between the **State of Oregon acting by and through its Oregon Department of Aviation ("Aviation")** and **HDSE Sewer System Owners Association,** an Oregon nonprofit corporation ("Lessee") and is dated effective September 1, 2019.

The HDSE Sewer System operated and owned by Lessee is located on the adjacent common element land of the Southend Corporate Airpark Condominium and other adjacent private property; the sewer system Lessee owns and operates serves the members of Lessee.

Aviation and Lessee agree as **follows:**

1) PREMISES. Aviation, as owner of the Aurora State Airport, Marion County, Oregon hereby leases to Lessee and Lessee leases from Aviation the premises described in Exhibit A, comprised of a portion of the Aurora State Airport property of approximately **23,370** square feet for a Drainfield for the HDSE Sewer System and approximately **23,370** square feet for reserve area for the Drainfield and approximately **14,635** square feet for piping between the existing drainfield and the reserve area and to the HDSE private property in an area comprising 2.5 on either side of such piping (the **"Premises").** The Premises are located on Tax Lot 041W11A00800 and is shown as the areas marked "drainfield" and "reserve area" on the attached Exhibit A, which is included herein by this reference.

Aviation conveys to Lessee an access easement over, across and under the Aurora State Airport land for access to the Premises. The easement is subject to all the terms and conditions of this Lease except the easement is not used in the calculation of the Rent, as described in Section 7 below.

Lessee may use the Premises only for the purposes set forth in Section 10 below. Lessee's use of the Premises is nonexclusive, but Aviation will not permit any other uses of the Premises that materially interferes with Lessee's permitted use of the Premises. Lessee acknowledges that the Premises are part of the Aurora State Airport and agrees that its uses of and entry into the Premises are subject to the operations of the Aurora State Airport in the ordinary course.

2) TERM. The term of this Lease (the **"Base Term")** commenced September 1, 2019 (the **"Effective Date")** and ends August 30, 2024. Lessee's right of possession begins on the Effective Date and, if not reviewed as described in Section 4 below, ends upon expiration of the Base Term or upon earlier termination of the Lease hereunder. Upon expiration or termination of the Lease Lessee must surrender the Premises to Aviation in good condition and may be required to remove the Drainfield facilities, piping, or appurtenant underground equipment.

3) HOLDING OVER. If the Lease is not renewed under Section 4 below, any holding over after the expiration of the Base Term or, if the Lease is renewed pursuant to Section 4, after expiration or the renewal term, will constitute a month to month tenancy subject to the terms of this Lease, but at a monthly

rental rate to be determined by Aviation in its sole discretion. Holding over is subject to termination on 30 days written notice by Aviation.

4) OPTION TO RENEW. Lessee may renew this Lease by written notice to Aviation at least 120 days before the expiration of the then-current term for two additional terms of five years each, subject to the satisfaction of the following conditions:

a) Lessee must not be in default by the end of the term then in effect.

b) The Premises must be in safe and clean condition as determined by Aviation as described in OAR 738-015-0025 and the drainfield must be functioning as intended and in compliance with all applicable permits and laws. If the drainfield appears to be malfunctioning, Aviation may require Lessee to obtain an inspection by a certified inspector, at Lessee's expense, to verify the condition and functioning of the drainfield. Lessee shall correct any deficiencies as a condition of Lease renewal.

c) Lessee has given written notice to Aviation at least 120 days before the last day of the Base Term that Lessee has complied with requirements (a) and (b) of this section and intends to exercise Lessee's option to renew.

d) Lessee is willing to amend the Lease to include any modified or additional lease terms required by Aviation to conform the Lease to terms generally applicable to non-commercial site leases on state -owned airports then in effect.

e) Lessee is willing to agree to modifications in Rent due under the Lease that may be required under Oregon Administrative Rules, Chapter 738, Division 10, Schedule of Rates and Fees for State-Owner Airports.

5) ASSIGNMENT. This Lease is personal to Lessee and may not be assigned without the prior written approval of Aviation, which Aviation may grant, condition or withhold in its sole discretion. As a condition of granting approval of an assignment of this Lease, Aviation may require the assignee to enter into a new lease of the Premises.

6) SUBLEASING. Lessee may not sublease any portion of the Premises for any purpose.

7) RENT. Lessee shall pay to Aviation an initial annual rent of **$3,068.75 ($00.05 per square foot per year) ("Rent")** for its use and enjoyment of the Premises. The first year's Rent is payable not later than the Effective Date, and thereafter each year in advance and without notice, not later than the anniversary of the Effective Date. Aviation reserves the right to review and adjust the Rent as described in Oregon Administrative Rules, Chapter 738, Division 10, Schedule of Rates and Fees for State-Owner Airports for a non-commercial site lease. If Aviation adjusts the Rent, Aviation will notify Lessee not less than 60 days prior to the date upon which the adjusted Rent is due.

8) TAXES and LIENS.

a) The Premises are currently listed on the Marion County property tax rolls as state-owned property not subject to property tax assessment. Lessee acknowledges that the tax classification of the Premises may change as a result of the lease of the Premises to a taxable lessee. Lessee shall pay when due all

taxes, if any, levied against the Premises and on any improvements made or placed on the Premises, whether due to a change in the tax classification of the Premises, or otherwise. Lessee shall ensure that any taxable improvements are lawfully brought to the attention of the Marion County tax assessor. If the County sends a . tax statement directly to Aviation, Aviation shall provide a copy to Lessee along with a demand for payment of the taxes, if any, by Lessee. Lessee shall pay any such taxes in full within 30 days after receipt of demand and shall provide proof of payment to Aviation.

b) Lessee shall keep the Premises free of all liens and encumbrances.

c) If Lessee's use of the Premises incurs utility charges, Lessee will be responsible for the cost.

9) PENALTIES.

a) If any payment due under this Lease is not paid within 10 days after its due date, Lessee shall owe and shall pay to Aviation an administrative charge of 10 percent of the amount due per month. Failure to make full payment, including the administrative charge, within 30 days after the date the payment is due is a default. Imposition of an administrative charge on delinquent payments does not constitute a waiver of any of Aviation's rights to pursue its legal remedies under the law or as provided in this Lease.

b) If any check to Aviation for payment under this Lease is returned to Aviation by Lessee's bank unpaid for any cause, Lessee shall owe to Aviation a $50 fee in addition to the amount of the check and any administrative charge owed under the above paragraph. Amounts due Aviation are considered unpaid until Aviation receives payment from the bank.

10) PERMI1 ED USES. Lessee may use the Premises solely for the construction, maintenance, repair, use, operation, and replacement of an individual water-carried on-site sewage disposal system that serves the members of Lessee. Lessee shall install, maintain and repair the drainfield to Marion County standards and requirements and in compliance with all federal, state and local law. If there is any indication of Drainfield failure, Lessee shall immediately cease use of the drainfield until repairs are accomplished. Lessee may landscape the Premises, provided such landscaping is compatible with the Aurora State Airport and its environs. Lessee is required to mow and maintain the ground within the Premises' footprint to prevent the Premises from being an attractant for wildlife.

11) CONS 1'RUCTION OF IMPROVEMENTS. A drainfield of approximately 54,575 square feet has been constructed on the Premises in the location show on the attached Exhibit A and an additional 54,575 square feet was available for reserve in the future. Lessee may construct additional drainfield facilities in the area of the Premises so long as Lessee obtains all necessary county or state permits and approvals for construction of the drainfield, which will be constructed and maintained in accordance with plans approved during the local government and Department of Environmental Quality permit process. Aviation may require post of performance and payment bonds, letters of credit, or other security instruments to ensure Lessee's financial responsibility. Upon verification of completion of construction of any expansion of the drainfield, any security instrument held by Aviation will be released. Notice of all proposed construction or alteration must be submitted through Aviation to the Federal Aviation Administration on FAA Form 7460-1, "Notice of Proposed Construction or Alteration" as prescribed in Section 77.17 of the Federal Aviation Regulations. All construction or alteration must be completed in a good and workmanlike manner.

12) INDEMNIFICATION. Lessee shall conduct its activities under this Lease at Lessee's own risk, and shall hold harmless and indemnify the State of Oregon, Department of Aviation, its agents, officers and employees from all damages, demands, suits or actions whatsoever resulting from or because of, any damage to property, injury or death to any person(s) arising out of Lessee's negligent construction, maintenance, repair, alteration, operation, control or use of the Premises.

13) INSURANCE.

a) Liability Insurance. Lessee shall maintain in force during the term of this Lease commercial general liability insurance covering the Premises and operations of Lessee. Combined single limit for bodily injury and property damage must not be less than $1,000,000 per occurrence.

b) Additional Insured. The liability coverage must include the State of Oregon, the Oregon Department of Aviation, and their respective officers and employees as additional insureds. Coverage must be severable for all insureds or covered under cross liability of all insureds.

c) Certificate of Insurance. As evidence of the insurance coverage required under this agreement, Lessee shall furnish certificate(s) of insurance to aviation no later than the Effective Date. The certificate(s) must clearly show the State of Oregon, the Oregon Department of Aviation, and their respective officers and employees as additional insureds for the liability coverage required under this section, and must otherwise reflect compliance with the relevant terms of this section. The policies required in this section must be obtained from insurers with a Best's rating of not less than "A" or with approved Oregon surplus lines insurers.

d) Notice of Cancellation. There must be no cancellation of any insurance required under this section, or potential exhaustion of aggregate limits, without 30 days written notice from Lessee or its insurers to Aviation.

14) HAZARDOUS SUBSTANCES. Lessee shall not store or allow any hazardous substance as defined in OAR 738-005-0010 (67) or petroleum products to be released on the Premises or on Airport property other than that necessary for the conduct of Lessee's business. Lessee shall recycle petroleum products and dispose of hazardous substances in accordance with Oregon Department of Environmental Quality's rules and regulations, which are available to Lessee by contacting the Oregon Department of Environmental Quality. All costs associated with the use of hazardous substances or petroleum products, including costs of cleanup, removal, remediation, and compliance with federal, state and local environmental requirements, are the sole responsibility of lessee and Lessee shall indemnify and hold Aviation harmless from any costs, fees, penalties or other expense incurred by Aviation in connection with remediation of hazardous substances on the Premises. All hazardous substances and petroleum products must be used, handled, cleaned up, removed and remediated in accordance with federal, state and local requirements.

15) FIRE PREVENTION. Lessee shall exercise due and reasonable care and caution to prevent and control fires on the Premises. Lessee shall comply with all relevant state, county, and local fire laws, codes and rules. Local and state fire marshals may enter the Premises to determine compliance with fire prevention laws, codes and rules.

16) COMPLIANCE WITH LAW. Lessee shall comply with all laws, ordinances, rules and regulations promulgated by any lawful authority of the United States, the State of Oregon, or any municipal

subdivision having authority over or jurisdiction of the Premises, including safety, health, sanitary, fire, electrical and building codes, zoning and state and local comprehensive plans and criminal laws.

17) AIRPORT REGULATIONS. This Lease is subject to and Lessee shall comply with all existing and future FAA regulations and other regulations and administrative rules adopted by the State Aviation Board relating to matters under the jurisdiction of FAA or the Aviation Board. Lessee shall execute any amendment to the Lease required in order to conform the Lease to FAA or aviation regulations or rules.

18) PROTECTION OF THE AIRPORT'S IMAGINARY SURFACES. Aviation may take action it considers necessary to protect the Aurora State Airport's imaginary surfaces, as defined by Federal Aviation Regulations, Part 77, and Oregon Administrative Rules against obstructions, and may prevent Lessee from erecting or permitting to be erected any building or other structure on the Premises that, in the opinion of Aviation, would limit the usefulness of the Aurora State Airport or constitute a hazard to aircraft.

19) AVIATION'S RIGHT OF EN IRY. Aviation may enter onto the Premises at any time to ascertain compliance with the terms of this Lease.

20) MAINTENANCE OF AIRPORT. Aviation shall maintain the runways, public taxiways, and aircraft parking area at the Airport. Aviation retains sole authority to determine the methods and schedules by which any maintenance or necessary construction is to be performed. Aviation shall close the Airport whenever it deems it necessary for reasons of public safety or convenience. Aviation shall make a good faith effort to provide advance notice of Airport closures when possible, but no advance notice is required when closure of the Airport is due to weather, acts of God, or other unforeseen circumstances.

21) DEFAULT. The following are events of default:

a) Default in Rent. Failure of Lessee to pay any Rent or other charge within 60 days after it is due.

b) Default of other Covenants. Failure of Lessee to comply with any term or fulfill any obligation of this Lease other than the payment of rent or other charges within 30 days after written notice by aviation specifying the nature of the default with reasonable particularity. If the default is of such a nature that it cannot be completely remedied within the 30-day period, Lessee will not be in default if Lessee begins correction of the default within the 30-day period and thereafter proceeds with reasonable diligence and in good faith to effect the remedy as soon as practicable.

c) Bankruptcy. Lessee enters bankruptcy proceedings and the trustee in such proceedings fails to assume the Lease.

22) REMEDIES ON DEFAULT.

a) Termination. In the event of a default by Lessee, Aviation may terminate this Lease by giving written notice to Lessee. Aviation may reenter, take possession of the Premises and remove any persons or property by legal action or by self-help without liability for damages and without having accepted surrender. Even if the Lease is terminated by the election of Aviation or otherwise, Aviation is entitled to recover damages from Lessee for the default, as described in this Section.

b) Lessee's Improvements. Within 120 days after receiving written notice of termination from Aviation, Lessee must vacate the Premises, including removing any improvements constructed by Lessee on the Premises. The written notice of default from Aviation may require that Lessee cease certain operations being conducted on the Premises, while Lessee is removing the improvements.

c) Rent during Termination Period. Rent will accrue until the improvements and personal property of Lessee have been removed and the Premises restored to their original condition, or until a new lease for the Premises has been negotiated, whichever first occurs. Rental amounts may be abated at the option of Aviation, in proportion to the amount of activity that Lessee continues to carry out during the 120-day termination period. Failure to comply with the conditions in the termination notice will be cause for immediate termination of possession and Lessee shall abandon all improvements.

d) Lessee's Operations. Aviation may require in its written notice of default that Lessee cease its operations on the Premises while Lessee is removing its personal property and improvements. Failure to comply with such a condition in the termination notice will be cause for immediate termination of possession.

e) Reletting. Following reentry or abandonment, Aviation may relet the Premises and in so doing may make any suitable alterations to the Premises, or change the character or use of the Premises, But Aviation is not required to relet for any cause or any use or purpose other than that specified in this Lease or that Aviation may reasonably consider injurious to the Premises, or to any tenant that Aviation may reasonably consider objectionable. Aviation may relet all or part of the Premises, alone or in conjunction with other properties, for a term longer or shorter than the term of this Lease, upon any reasonable terms and conditions, including granting some rent-free occupancy or other rent concession.

f) Damages. In the event of termination or retaking possession of the Premises following Lessee's default, Aviation is entitled to recover immediately, without waiting until the due date of any future rent or until the date fixed for expiration of the Lease term, the following amounts as damages:

i) all rent prepaid by Lessee;

ii) the loss of rental income from the date of default until a new Lessee is, or with the exercise of reasonable efforts could have been, secured and paying rent; and

iii) the reasonable costs of reentry and reletting, including the cost of any cleanup, refurbishing, removal and storage of Lessee's property, or any other expenses occasioned by Lessee's default including any repair costs, attorney fees, and court costs.

g) Aviation's Authority to Cure Default. If Lessee fails to perform any obligation under this Lease, Aviation may do so after giving 30 days' written notice to Lessee. Lessee will have to reimburse on demand, with interest at the rate of 10 percent per annum from the date of expenditure by Aviation, all of Aviation's expenditures to correct the default. Aviation's cure under this subsection does not waive any other remedies available to Aviation because of the default.

h) Remedies Cumulative. The foregoing remedies are in addition to and do not exclude any other remedy available to Aviation under applicable law.

23) TERMINATION FOR AIRPORT DEVELOPMENT. If the State Aviation Board determines that the Premises are required by Aviation for Airport development in accordance with the Airport Master Plan and FAA-approved Airport Layout Plan, Aviation shall either offer an alternative site to Lessee, if available on the Aurora State Airport property or terminate the Lease upon 120 days written notice to Lessee. If no suitable alternative site is available, or Lessee chooses not to relocate within the 120-day period, this Lease may be terminated by either party. Upon termination, Lessee will vacate the Premises. No compensation is due for loss of renewal terms. Aviation shall prorate and return to Lessee any prepaid rent upon satisfactory vacation of the Premises.

24) TERMINATION FOR NECESSARY CLOSURE OF THE AIRPORT. If the State Aviation Board determines that it is necessary or advisable to abandon or close the Aurora State Airport due to the development of uncontrollable hazards to flight operations, lack of public use, prohibitive maintenance costs, legislative actions or other cause, Aviation may terminate this Lease on 120 days written notice to Lessee and compliance with Section 22.

25) ABOLITION OF DEPARTMENT OF AVIATION OR TRANSFER OF AIRPORT OWNERSHIP. If Aviation is replaced or abolished as a state agency, or the Aurora State Airport is transferred into other ownership, Aviation shall make a diligent effort as a condition of the transfer to secure in writing the transferee's prior assurance that the transferee, by acceptance of ownership of the Airport, assumes Aviation's responsibilities under terms and conditions of this Lease.

26) NO WARRANTY OF NON-IN I EREERENCE BY ENTITIES OUTSIDE AVIATION'S CONTROL. If the State Aviation Board determines that it is necessary or advisable to abandon or close the Airport due to the development of uncontrollable hazards to flight operations, lack of public use, prohibitive maintenance costs, legislative actions or other cause, Aviation may terminate this Lease by written notice to lessee.

27) ACCRUED RIGHTS. Any termination of this Lease or of rights and benefits under it is without prejudice to the obligations, liabilities or rights of any party already accrued prior to termination.

28) NOTICES.

a) Any notices required to be given under this Lease must be in writing and given by personal delivery, facsimile or deposit in the regular United States Mail postage prepaid. Any notice delivered by mail is deemed given three days after mailing is provided above. Any notice delivered by facsimile is deemed given when a confirmation of successful transmission is generated by the transmitting machine. To be effective against Aviation, facsimile transmission must be confirmed by telephone notice to an employee at the Department of Aviation at (503) 387-8689. Any communication or notice by personal delivery is deemed given when actually delivered. A party may designate a change of address by written notice to the other party.

b) Notices to Aviation must be directed to the following address, facsimile number and email:

Oregon Department of Aviation
3040 25th Street SE
Salem, OR 97302
Phone (503)378-4880
Fax: (503) 378-1688

Rent payments to be sent to:

Oregon Department of Transportation
Financial Services
3930 Fairview Industrial Drive SE, MS #1
Salem OR 97302-1166

Questions regarding the Lease may be directed to:

State Airports Manager
Attn: Matthew Maass, or successor
Phone: (503) 378-2521
Email: nnatthew.d.maass@aviation.state.or.us

Or ODA Airport Operations Specialist

Attn: John Wilson, or successor
Phone: (503) 378-2521
Email: john.p.wilson@aviation.state.orus

c) Notices to Lessee must be directed to the address and facsimile number, if any, provided on the signature page of this Lease.

29) COVENANTS. The covenants of this Lease are continuing covenants, and waiver, whether express or implied by Aviation or Lessee, of any breach of these covenants may not be deemed a waiver of subsequent breaches.

30) FUTURE AGREEMENTS. This Lease constitutes the entire contract between the parties other than that certain Easement between the parties affecting the Premises dated effective September 1, 2019. Any future agreement between the parties relative to this Lease is ineffective to modify or discharge the Lease, in whole or in part, unless it is in writing and executed with the same formalities as this instrument. Lessee, by signing below, hereby acknowledges reading this Lease, understanding it, and agreeing to be bound by its terms.

31) AVIATION'S RIGHT TO DEVELOP THE AIRPORT. Aviation reserves the right to further develop or improve the Airport in accordance with its duty to develop aviation within the state as dictated by the demands of air traffic and aviation safety.

32) SUBORDINATION TO FEDERAL-STATE, AGREEMENTS.

a) The terms of this Lease are subordinate to any existing or future agreement between Aviation and the United States relative to the operation or maintenance of the Aurora State Airport, the execution of which has been or may be required as a condition precedent to the receipt of federal funds for the development of the Aurora State Airport. Failure of Lessee to comply with any term of this Lease required by any existing or future agreement between Aviation and the United States is a default, following notice and opportunity to cure as set forth in Section 21(b) above.

b) During a time of war or national emergency, Aviation may lease the landing area or any part of it to the United States for military or other federal government purposes and, if this occurs, any term of this Lease that is inconsistent with any term in such a lease to the federal government is deemed to be suspended while such lease is in effect.

33) NO EXCLUSIVE RIGHT. Nothing in this Lease may be construed to grant or authorize the granting of an exclusive right forbidden by the FAA Airport Compliance Manual Order 5190.6B Chapter 8 (Exclusive Rights).

34) TIME. Time is of the essence for every term of this Lease.

35) AUTHORITY.

a) All powers and authority conferred upon lessee by this Lease are to be strictly construed, and no other power may be lawfully exercised by lessee without Aviation's prior written consent. Lessee has no any authority to act on behalf of Aviation, or to bind Aviation to any third party, contractually or otherwise, except as is expressly stated in this Lease.

b) The terms of this Lease may not be construed to make Lessee an officer, employee or agent of the State of Oregon or its Department of Aviation, as those terms are used in ORS 36.265.

c) The person executing this Lease on behalf of Lessee represents that he or she has the legal power, right, and actual authority to bind Lessee to the terms and conditions of this Lease.

d) The State Aviation Board, by duly-adopted Delegation Order No.1, dated October 12, 2000 has authorized the Director of the Department of Aviation to act in its behalf in approving and executing this Lease.

(signatures on next page)

EXECUTED by the parties as of the last date written below.

AVIATION:

STATE OF OREGON, by and through its Department of Aviation

By: A.4—\1\kt _____ Date: /3 V-41 2421)
As. Director,_____
Nitr6Ate11. tuldwilathez

LESSEE:

HDSE SEWER SYSTEM OWNERS ASSOCIATION,
an Oregon nonprofit corporation

By: _____ Date: I I CI
As: Chairperson, Ted L. Millar

By:
As: Secretary, molt. r

Address and Contact for Notice:

Community Management Inc.
2105 SE 9th Ave.
Portland, OR 97214

Association Manager: Community Management, Inc,
Attn: Steve Meyer
Telephone: (Daytime) (503) 445-1216
Stevem@communitymgt.com

EXHIBIT A

Premises: Legal Description and Depiction of Drainfield

77

CHASE, JONES & ASSOCLATES INC
FORMENLY BOOTH & WIGHT
LAND SURVEYORS 1 INGINIi2IRS SINCE 1885

718 SE 11771 AliENUE POINZAND, OR 97214
PNOAE: (503) 228-9844

Date: October 24, 2019
Project No.: 15559

Drain Field Easement

A portion of the property of State of Oregon, Department of Aviation, as described in Exhibit "A" of the "Aurora State Airport Utility Easement" recorded April 20, 2005, in reel 2467 at page 278 of Marion County Records, situate in the East Half of Section 11, Township 4 South, Range 1 West, Willamette Meridian, in the County of Marion, State of Oregon, being described as follows:

COMMENCING at the Southwest corner of said Department of Aviation property; thence South 82°52'09" East 458.64 feet; thence North 02°48'30" East 50.00 feet to the **POINT OF BEGINNING** of the herein described Drain Field Easement; thence North 02°48'30" East 131.50 feet; thence North 04°32'50" West 138.00 feet; thence South 88°05'20" East 87.00 feet; thence South 04°32'50" East 138.00 feet; thence South 02°48'30" West 131.50 feet; thence North 88°05'20" West 87.00 feet to the **POINT OF BEGINNING.**

The above described Drain Field Easement contains 23,370 square feet, more or less.

The basis of bearing for this Easement is South 82°52'09" *East* along the South line of the "State of Oregon Aeronautics Division" Property shown on the Lot Line Adjustment filed in the Marion County Survey Records as survey number 32463-A.

r. REGISTERED
PROFESSIONAL
LAND SURVEYOR

OREGON
JULY 16, 1982
ERRIC D. JONES
1 9 9 6

EXPIRES: 6-30— 21

CHASE, JONES & ASSOCIATES INC.
FORMERLY BOON & WOW
LAM SURVEYORS & Li7VGINUNS SWGE 1885

CJ2

716 SE 1171 AVENUE POR7ZAM14 OR 97214
PROW (503) 228-9844

Date: October 24, 2019
Project No.: 15559

Reserve Easement

A portion of the property of State of Oregon, Department of Aviation, as described in Exhibit "A" of the "Aurora State Airport Utility Easement" recorded April 20, 2005, in reel 2467 at page 278 of Marion County Records, situate in the East Half of Section 11, Township 4 South, Range 1 West, Willamette Meridian, in the County of Marion, State of Oregon, being described as follows:

COMMENCING at the Southwest corner of said Department of Aviation property; thence South 82°52'09" East 89.31 feet; thence North 00°45'00" East 80.00 feet to the **POINT OF BEGINNING** of the herein described Reserve Easement; thence North 00°45'00" East 227.14 feet; thence South 86°35'00" East 103.00 feet; thence South 00°45'00" West 227.14 feet; thence North 86°35'00" West 103.00 feet to the **POINT OF BEGINNING.**

The above described Reserve Easement contains 23,370 square feet, more or less.

The basis of bearing for this Easement is South 82°52'09" **Fa**st along the South line of the "State of Oregon Aeronautics Division" Property shown on the Lot Line Adjustment filed in the Marion County Survey Records as survey number 32463-A.

REGISTERED PROFESSIONAL LAND SURVEYOR

OREGON
JULY 16, 1982
ERRIC D. JONES
1 9 9 6

EXPIRES: 6-30-21

g A '1.09 1'2E1'171'7Z2V

DR4/N F/EZZ' RESERVEAREA EASEMENT

OVER .4 POR770N OF
TAX LOT 800
SM/ATEP THE
EAST 1/2 OF SEC77011 11, T4S, R1W, WM
COUNTY OF MAR/ON, STATE OF OREGON

BY:
CHASE, JONES Sc ASSOCIATES INC.
716 S. E. 11TH AVE. PORTLAND, OREGON 97214
PHONE (503) 228-9844

PROJECT NO.: 15559 DATE: OCT. 22, 2019
SCALE- 1" = 80'

0 80 160

REGISTERED
PROFESSIONAL
LAND SURVEYOR

Errie D. Jones

OREGON
(, JULY 16, 1982
ERRIC D. JONES
1 9 9 6

RENEWS: 6-30-21

HUBBARD CUT-OFF
(STATE HIGHWA Y 164)
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S 863500" E

S 88'05'20" E
87.00'7Ln

41M

RESERVE
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orrAgrm _ENT:: 406Fvo s

POINT OF BEG/NNING
OF RESERVE AREA

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• N 88-05'20" W

S 62.52:99' e 600.0e.

sR32 0F 3DRA/N F/ELD

L PO/NT OF COMMENCEMENT SW
CORNER OF DEPARTMENT OF
AV/AT/ON PROPERTY.
FOUND 1/2" /RON ROD

irEIL ROAD

147 44'

FOUND 5/8
/RON ROD

August 9, 2023

Director Kenji Sugahara
Oregon Department of Aviation
3040 25th Street SE
Salem, OR 97302

Re: Notice to Exercise Lease Renewal

Dear Director Sugahara,

This letter constitutes legal notice by HDSE (lessee) to ODAV (lessor) as per the requirements called out in (see attached lease), Item 4., to renew the lease in the first of two, five-year renewal periods.

Sincerely,

Anthony A. Helbling
President
HDSE Board of Directors

Cc: HDSE Board
File

Outlook

Fw: Aurora State Airport Master Expansion Plan

From Brandy Steffen <brandy.steffen@jla.us.com>
Date Fri 6/14/2024 2:26 PM
To Jen Winslow <Jen.winslow@jla.us.com>

FYI - another comment

BRANDY STEFFEN | JLA PUBLIC INVOLVEMENT
brandy.steffen@jla.us.com » 503-235-5881 » jla.us.com
Woman-led, community-centered, for 35 years and counting
Meeting + email hours 9 a.m.–5 p.m. Tuesday–Friday. Administrative-only hours on Monday.
Check my availability » Schedule a 30 minute check-in

From: BEACH Anthony <Anthony.BEACH@odav.oregon.gov>
Sent: Friday, June 14, 2024 8:08 AM
To: dell.web@frontier.com <dell.web@frontier.com>
Cc: THOMAS Alex R <Alex.R.THOMAS@odav.oregon.gov>; PIKE Brandon <Brandon.PIKE@odav.oregon.gov>; Brandy Steffen <brandy.steffen@jla.us.com>
Subject: RE: Aurora State Airport Master Expansion Plan

Hi Mr. Johnson, thank you for your comments.

ODAV does not have any airspace authority or regulate how pilots operate their aircraft. Those are the responsibility of the FAA. However, our published noise abatement procedures do encourage traffic to turn over I-5 and avoid flying over neighboring communities such as Wilsonville. Helicopter Transport Services is not part of the Aurora State Airport, but we will pass on your message to them as well.

I appreciate you sending these comments and we will continue to work with our operators to fly neighborly and avoid noise sensitive areas in our community.

Thanks again,

Tony Beach
OREGON DEPARTMENT OF AVIATION
STATE AIRPORTS MANAGER
OFFICE 503-378-2523 **CELL** 503-302-5455
M-F 7:30am – 4pm

From: dell.web@frontier.com <dell.web@frontier.com>
Sent: Friday, June 14, 2024 6:45 AM
To: Oregon Department of Aviation <mail.aviation@ODAV.oregon.gov>
Subject: Aurora State Airport Master Expansion Plan

You don't often get email from dell.web@frontier.com. Learn why this is important

This message was sent from outside the organization. Treat attachments, links and requests with caution. Be conscious of the information you share if you respond.

Aurora Airport Expansion
Noise Mitigation

Request that if the airport is allowed to lengthen the runway for larger aircraft, that those flights be limited to the I-5 freeway corridor. That steeper take-off angles be mandated. And that Wilsonville OR be designated a Noise Abatement Zone. Today, Helicopter Transport fly directly over our home in Wilsonville. Sometimes at low altitude but always in the late and early morning hours. Our windows shake and dogs bark in the neighborhood.

To be fair, you have already addressed this issue by requiring pilots of business jets to gain altitude quickly but still present noise pollution upon take-off and landing over town.. along with helicopter "red-eye" service.

The I-5 corridor won't eliminate noise but will help.

Mark Johnson
Wilsonville, OR

Outlook

Fw: KUAO Airport Plan

From Brandy Steffen <brandy.steffen@jla.us.com>
Date Thu 12/19/2024 8:16 AM
To Jen Winslow <Jen.winslow@jla.us.com>; Ashley Balsom <ashley.balsom@jla.us.com>

BRANDY STEFFEN | **JLA PUBLIC INVOLVEMENT**
Senior Program Manager + Partner
She/Her » Why pronouns matter
brandy.steffen@jla.us.com » Office 503-235-5881 » jla.us.com
Meeting + email hours 9 a.m.–5 p.m. Monday–Thursday » Administrative-only hours Friday
Check my availability » Schedule a 30 minute check-in

JLA Public Involvement's mission: To create collaborative, meaningful and exceptionally effective public processes that lead to better, more inclusive outcomes.

I will be on vacation starting Monday, 12/23/24 and will return on Monday, 01/06/25.
JLA will be closed December 24 through January 1 to allow our entire team time to rest and recover. Please get in touch early with any anticipated needs during this time. Wishing you a lovely end to 2024!

From: THOMAS Alex R <Alex.R.THOMAS@odav.oregon.gov>
Sent: Thursday, December 19, 2024 8:13 AM
To: Brandy Steffen <brandy.steffen@jla.us.com>; Samantha Peterson <SPeterson@CenturyWest.com>; BEACH Anthony <Anthony.BEACH@odav.oregon.gov>
Subject: FW: KUAO Airport Plan

Hello,

Good morning. Please include within the UAO record.

ALEX THOMAS
OREGON DEPARTMENT OF AVIATION (ODAV)
POLICY, PLANNING, & PROGRAMS MANAGER

CELL 971-375-2357

EMAIL Alex.R.Thomas@ODAV.Oregon.Gov

SALEM, OR 97302

WWW.OREGON.GOV/AVIATION

Schedule a meeting with me.

Schedule a meeting with any of the programs listed below.

Alternative Contacts:

COAR Grants: Grants@ODAV.Oregon.Gov
Procurement / Contracts: Contracts@ODAV.Oregon.Gov
Pavement (PEP/PMP): Pavement@ODAV.Oregon.Gov
Land Use / Tall Structure: LandUse@ODAV.Oregon.Gov

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From: Cathy Keller <cathykeller15@gmail.com>
Date: Thursday, December 19, 2024 at 08:06
To: THOMAS Alex R <Alex.R.THOMAS@odav.oregon.gov>
Subject: KUAO Airport Plan

You don't often get email from cathykeller15@gmail.com. Learn why this is important

This message was sent from outside the organization. Treat attachments, links and requests with caution. Be conscious of the information you share if you respond.

Dear ODAV c/o Alex Thomas,

As a member of the business aviation community who sees how vital Aurora is to big business in oregon, please register and record my urgent input for the Aurora Airport Master Plan that is underway not to consider the condemnation and destruction of any aircraft hangars. What we need is more hangars, not less hangars. GA is a boon to the economy and Biz Av is a productivity tool. The money in biz aviation right now in Oregon is at that airport. It's got the highest number of business jets and is so key to many customers. This is an airport to expand, not shrink.

Thank you
Cat Keller

Columbia Cascade Ninety Nines Chapter Chair
Hillsboro Aviation Airplane & FBO Manager
CAA Member & Private Pilot

Outlook

Fw: Aurora meeting please

From Jen Winslow <Jen.winslow@jla.us.com>
Date Mon 2024-09-16 1:06 PM
To Ashley Balsom <ashley.balsom@jla.us.com>

JEN WINSLOW | **JLA PUBLIC INVOLVEMENT**
She/Her » Why pronouns matter
jen.winslow@jla.us.com » Cell 503-367-6447 » jla.us.com
Woman-led, community-centered, for 35 years and counting
I typically work Mon - Fri | 9 am - 5 pm

From: Brandy Steffen <brandy.steffen@jla.us.com>
Sent: Friday, September 13, 2024 3:51 PM
To: W. Matt Rogers <WRogers@CenturyWest.com>; Jen Winslow <Jen.winslow@jla.us.com>
Cc: Samantha Peterson <SPeterson@CenturyWest.com>
Subject: Re: Aurora meeting please

Thanks Matt. We'll add it in.

Thanks,
Brandy

BRANDY STEFFEN | **JLA PUBLIC INVOLVEMENT**
Strategist + Partner
She/Her » Why pronouns matter
brandy.steffen@jla.us.com » 503-235-5881 » jla.us.com
Woman-led, community-centered, for 35 years and counting
Meeting + email hours 9 a.m.–5 p.m. Monday–Thursday. Administrative-only hours on Friday.
Check my availability » Schedule a 30 minute check-in

I will be on vacation starting Wednesday, September 18 and will return on Monday, September 23.

From: W. Matt Rogers <WRogers@CenturyWest.com>
Sent: Friday, September 13, 2024 1:55 PM
To: Brandy Steffen <brandy.steffen@jla.us.com>; Jen Winslow <Jen.winslow@jla.us.com>
Cc: Samantha Peterson <SPeterson@CenturyWest.com>
Subject: FW: Aurora meeting please

Hi Brandy and Jen,

ODAV asked us to add this to the official PAC record for the UAO AMP. Can you add it to the communication received?

Thanks,
Matt

From: Samantha Peterson <SPeterson@CenturyWest.com>
Sent: Friday, September 13, 2024 1:02 PM
To: W. Matt Rogers <WRogers@CenturyWest.com>
Subject: Fwd: Aurora meeting please

Begin forwarded message:

From: SUGAHARA Kenji <Kenji.SUGAHARA@odav.oregon.gov>
Date: September 13, 2024 at 12:59:39 PM EDT
To: BEACH Anthony <Anthony.BEACH@odav.oregon.gov>, THOMAS Alex R <Alex.R.THOMAS@odav.oregon.gov>, Samantha Peterson <SPeterson@centurywest.com>
Cc: Posegate Stacy C <Stacy.C.Posegate@doj.oregon.gov>
Subject: FW: Aurora meeting please

Hi Samantha-

Could you make this part of the official record for the PAC?

KENJI SUGAHARA
OREGON DEPARTMENT OF AVIATION
DIRECTOR

OFFICE 503-378-2340

EMAIL kenji.sugahara@odav.oregon.gov

3040 25TH STREET SE, SALEM, OR 97302

WWW.OREGON.GOV/AVIATION

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From: SUGAHARA Kenji
Sent: Friday, September 13, 2024 9:54 AM
To: Posegate Stacy C <Stacy.C.Posegate@doj.oregon.gov>
Subject: FW: Aurora meeting please

KENJI SUGAHARA
OREGON DEPARTMENT OF AVIATION
DIRECTOR

<image002.png>

<image003.png>

<image004.png>

OFFICE 503-378-2340

EMAIL kenji.sugahara@odav.oregon.gov

3040 25TH STREET SE, SALEM, OR 97302

WWW.OREGON.GOV/AVIATION

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From: Wendie Kellington <wk@klgpc.com>
Sent: Tuesday, September 3, 2024 3:40 PM
To: SUGAHARA Kenji <Kenji.SUGAHARA@odav.oregon.gov>
Cc: Schuster, Brad <brad.schuster@aopa.org>; Tony Helbling - Wilson Construction Company (helbling@wilsonconst.com) <helbling@wilsonconst.com>; Ted Millar <tmillar@wwpmi.com>; Aron Faegre (faegre@earthlink.net) <faegre@earthlink.net>
Subject: RE: Aurora meeting please

This message was sent from outside the organization. Treat attachments, links and requests with caution. Be conscious of the information you share if you respond.

Kenji,

Can we please schedule a brief meeting? Please let me know. Thank you. Best, Wendie

From: Wendie Kellington
Sent: Friday, August 30, 2024 4:20 PM
To: SUGAHARA Kenji <Kenji.SUGAHARA@odav.oregon.gov>
Cc: Schuster, Brad <brad.schuster@aopa.org>; Tony Helbling - Wilson Construction Company (helbling@wilsonconst.com) <helbling@wilsonconst.com>; Ted Millar <tmillar@wwpmi.com>; Aron Faegre (faegre@earthlink.net) <faegre@earthlink.net>
Subject: Aurora meeting please

Kenji,

We'd like to schedule a 20-minute zoom meeting with you this coming Tuesday or Wednesday to discuss KUAO. As you know, the aeronautical interests at the airport are justifiably quite concerned about the master plan alternatives and it has gotten the attention of national interests as well. We want to be sure that you understand the concerns and we would like to understand your thinking for advancing them. Please let me know what works. Thank you. All the best, Wendie



Wendie L. Kellington | Attorney at Law.
MAILING ADDRESS:
P.O. Box 2209
Lake Oswego, OR 97035
PHYSICAL ADDRESS
4500 Kruse Way, #340
Lake Oswego Or 97035
(503) 636-0069 office
(503) 636-0102 fax
wk@klgpc.com
www.wkellington.com

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RE: Aurora Airport Master Plan Proceedings - EMAIL #1 of 9

Wendie Kellington <wk@klgpc.com>

Tue 9/3/2024 11:33 AM

To:BEACH Anthony <Anthony.BEACH@odav.oregon.gov>;Brandy Steffen <brandy.steffen@jla.us.com>;THOMAS Alex R <Alex.R.THOMAS@odav.oregon.gov>
Cc:SUGAHARA Kenji <Kenji.SUGAHARA@odav.oregon.gov>;brad.schuster@aopa.org <brad.schuster@aopa.org>; agertsen@nbaa.org <agertsen@nbaa.org>;Phil Derner (pderner@nbaa.org) <pderner@nbaa.org>;Ted Millar <tmillar@wwpmi.com>;Tony Helbling - Wilson Construction Company (helbling@wilsonconst.com) <helbling@wilsonconst.com>;Aron Faegre (faegre@earthlink.net) <faegre@earthlink.net>;Bruce Bennett - Aurora Aviation (bruce@auroraaviation.com) <bruce@auroraaviation.com>;Kevin Cameron - Marion County Board of Commisioners (kcameron@co.marion.or.us) <kcameron@co.marion.or.us>;benwest@clackamas.us <benwest@clackamas.us>;Rep Lewis <Rep.RickLewis@oregonlegislature.gov>;sen.fredgirod@oregonlegislature.gov <sen.fredgirod@oregonlegislature.gov>;Trent Brownlee (Trent.brownlee@atlanticaviation.com) <Trent.brownlee@atlanticaviation.com>;David Waggoner <dave@WillametteAir.com>;Eric Postma (epostma@bittner-hahs.com) <epostma@bittner-hahs.com>;Rachel Bacon <rb@klgpc.com>

2 attachments (6 MB)

ODAV Form.pdf; FINAL 9.03.24 LTR TO ODAV.pdf;

Tony, Brandy, and Alex,

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- **None** of ODAV's three "alternatives" for the airport are tenable, although Millar notes that Alternative 1B is the least bad and that Alternative 2 is completely devastating to aviation at the airport. Alternative 2 effectively condemns the airport with ODAV acquiring all or most of it so ODAV can essentially start over – costing taxpayers hundreds of millions of dollars to implement (dollars that do not exist and ODAV does not show otherwise), significant loss of tax revenue, loss of good jobs, loss area tourist revenue, loss of an extremely important state and regional natural disaster asset, all to gain some 27' of separation between the runway and Highway 551, when federal standards allow imperfect compliance with that standard, if ODAV merely asks. To aid ODAV in that regard, a fully supported "Modification to Standards" prepared by an airport professional is Exhibit B to Millar's submitted materials. There is little doubt that FAA will approve it. We note FAA approved such minimal imperfection when it approved the 2012 ALP. If "incremental progress" toward perfection is desired, Millar's Exhibit A alternative suggests merely working with ODOT to move the perimeter fence closer to the ODOT ROW.
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We look forward to working with ODAV concerning a reset with reasonable alternatives like Exhibit A, for the airport. Regards, Wendie Kellington



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Aurora Airport Master Plan Proceedings - email #2 of 9

Wendie Kellington <wk@klgpc.com>

Tue 9/3/2024 11:36 AM

To:BEACH Anthony <Anthony.BEACH@odav.oregon.gov>;THOMAS Alex R <Alex.R.THOMAS@odav.oregon.gov>;Brandy Steffen <brandy.steffen@jla.us.com>
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2 attachments (7 MB)

Exhibit B UAO airport risk analysis for ROFA mod to standards - 2024-8-29.pdf; Exhibit A MP- Masterplan Alternative 2024-8-31.pdf;

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Aurora Airport Master Plan Proceedings - email #3 of 9

Wendie Kellington <wk@klgpc.com>

Tue 9/3/2024 11:41 AM

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3 attachments (13 MB)

Exhibit C FMA-Tech-Report-Final SUN airport risk analysis for ROFA mod to standards (002)_Part3.pdf; Exhibit C FMA-Tech-Report-Final SUN airport risk analysis for ROFA mod to standards (002)_Part1.pdf; Exhibit C FMA-Tech-Report-Final SUN airport risk analysis for ROFA mod to standards (002)_Part2.pdf;

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runway, and does not require anyone to "move" the air traffic control tower. *See* Millar's Exhibit A, supported by the Exhibit B technical analysis.

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KELLINGTON LAW GROUP

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RE: Aurora Airport Master Plan Proceedings - email #4 of 9

Wendie Kellington <wk@klgpc.com>

Tue 9/3/2024 11:46 AM

To:BEACH Anthony <Anthony.BEACH@odav.oregon.gov>;THOMAS Alex R <Alex.R.THOMAS@odav.oregon.gov>;Brandy Steffen <brandy.steffen@jla.us.com>
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5 attachments (9 MB)

Exhibit H order-5300-1G-modifications-to-standards.pdf; Exhibit J County P and Airport Overlay Zone.pdf; EXH F Southend HDSE LUD.pdf; Exh G Pilot Handbooks.pdf; EXH I Aurora Airport Resiliency Plan - updated 2024-8-30.pdf;

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RE: Aurora Airport Master Plan Proceedings - email #4 of 9

Wendie Kellington <wk@klgpc.com>

Tue 9/3/2024 11:44 AM

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2 attachments (7 MB)

EXH E HDSE drainfield expansion Geotech Study AronFA-2-01-110821-geor.pdf; EXH D Transportation Research Board - ACRP Report 51.pdf;

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EXH E HDSE drainfield expansion Geotech Study AronFA-2-01-110821-geor.pdf; EXH D Transportation Research Board - ACRP Report 51.pdf;

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Please see the attached letter and forthcoming exhibits reflecting the comments of PAC Member Millar, TLM and AABC (collectively Millar) concerning the July 30, 2024, draft Aurora Airport Alternatives. Please include this letter and its exhibits in the record of the Aurora Airport Master Plan proceedings. Please confirm receipt. Please also note that due to the size of this transmission it will be coming in nine (9) parts. To summarize the attached and forthcoming transmittals with Millar's comments:

- **None** of ODAV's three "alternatives" for the airport are tenable, although Millar notes that Alternative 1B is the least bad and that Alternative 2 is completely devastating to aviation at the airport. Alternative 2 effectively condemns the airport with ODAV acquiring all or most of it so ODAV can essentially start over – costing taxpayers hundreds of millions of dollars to implement (dollars that do not exist and ODAV does not show otherwise), significant loss of tax revenue, loss of good jobs, loss area tourist revenue, loss of an extremely important state and regional natural disaster asset, all to gain some 27' of separation between the runway and Highway 551, when federal standards allow imperfect compliance with that standard, if ODAV merely asks. To aid ODAV in that regard, a fully supported "Modification to Standards" prepared by an airport professional is Exhibit B to Millar's submitted materials. There is little doubt that FAA will approve it. We note FAA approved such minimal imperfection when it approved the 2012 ALP. If "incremental progress" toward perfection is desired, Millar's Exhibit A alternative suggests merely working with ODOT to move the perimeter fence closer to the ODOT ROW.
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We look forward to working with ODAV concerning a reset with reasonable alternatives like Exhibit A, for the airport. Regards, Wendie Kellington



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RE: Aurora Airport Master Plan Proceedings - email #6 of 9

Wendie Kellington <wk@klgpc.com>

Tue 9/3/2024 11:52 AM

To:BEACH Anthony <Anthony.BEACH@odav.oregon.gov>;THOMAS Alex R <Alex.R.THOMAS@odav.oregon.gov>;Brandy Steffen <brandy.steffen@jla.us.com>
Cc:SUGAHARA Kenji <Kenji.SUGAHARA@odav.oregon.gov>;brad.schuster@aopa.org <brad.schuster@aopa.org>; agertsen@nbaa.org <agertsen@nbaa.org>;Phil Derner (pderner@nbaa.org) <pderner@nbaa.org>;Ted Millar <tmillar@wwpmi.com>;Tony Helbling - Wilson Construction Company (helbling@wilsonconst.com) <helbling@wilsonconst.com>;Aron Faegre (faegre@earthlink.net) <faegre@earthlink.net>;Bruce Bennett - Aurora Aviation (bruce@auroraaviation.com) <bruce@auroraaviation.com>;Kevin Cameron - Marion County Board of Commisioners (kcameron@co.marion.or.us) <kcameron@co.marion.or.us>;benwest@clackamas.us <benwest@clackamas.us>;Rep Lewis <Rep.RickLewis@oregonlegislature.gov>;sen.fredgirod@oregonlegislature.gov <sen.fredgirod@oregonlegislature.gov>;Trent Brownlee (Trent.brownlee@atlanticaviation.com) <Trent.brownlee@atlanticaviation.com>;David Waggoner <dave@WillametteAir.com>;Eric Postma (epostma@bittner-hahs.com) <epostma@bittner-hahs.com>;Rachel Bacon <rb@klgpc.com>

2 attachments (7 MB)

Exhibit K AC_150_5070-6B_with_chg_1&2.pdf; EXH L The West Coast Is at Risk_ New Megathrust Fault Research Indicates That the Next Big Earthquake Could Be Imminent.pdf;

Tony, Brandy, and Alex,

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RE: Aurora Airport Master Plan Proceedings - email #7 of 9

Wendie Kellington <wk@klgpc.com>

Tue 9/3/2024 11:55 AM

To:BEACH Anthony <Anthony.BEACH@odav.oregon.gov>;THOMAS Alex R <Alex.R.THOMAS@odav.oregon.gov>;Brandy Steffen <brandy.steffen@jla.us.com>
Cc:SUGAHARA Kenji <Kenji.SUGAHARA@odav.oregon.gov>;brad.schuster@aopa.org <brad.schuster@aopa.org>; agertsen@nbaa.org <agertsen@nbaa.org>;Phil Derner (pderner@nbaa.org) <pderner@nbaa.org>;Ted Millar <tmillar@wwpmi.com>;Tony Helbling - Wilson Construction Company (helbling@wilsonconst.com) <helbling@wilsonconst.com>;Aron Faegre (faegre@earthlink.net) <faegre@earthlink.net>;Bruce Bennett - Aurora Aviation (bruce@auroraaviation.com) <bruce@auroraaviation.com>;Kevin Cameron - Marion County Board of Commisioners (kcameron@co.marion.or.us) <kcameron@co.marion.or.us>;benwest@clackamas.us <benwest@clackamas.us>;Rep Lewis <Rep.RickLewis@oregonlegislature.gov>;sen.fredgirod@oregonlegislature.gov <sen.fredgirod@oregonlegislature.gov>;Trent Brownlee (Trent.brownlee@atlanticaviation.com) <Trent.brownlee@atlanticaviation.com>;David Waggoner <dave@WillametteAir.com>;Eric Postma (epostma@bittner-hahs.com) <epostma@bittner-hahs.com>;Rachel Bacon <rb@klgpc.com>

1 attachments (8 MB)

EXH M TLM property access taxilane 2024-8-8F.pdf;

Tony, Brandy, and Alex,

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RE: Aurora Airport Master Plan Proceedings - email #8 of 9

Wendie Kellington <wk@klgpc.com>

Tue 9/3/2024 11:57 AM

To:BEACH Anthony <Anthony.BEACH@odav.oregon.gov>;THOMAS Alex R <Alex.R.THOMAS@odav.oregon.gov>;Brandy Steffen <brandy.steffen@jla.us.com>
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1 attachments (2 MB)

EXHIBIT N - AAM-I28-Implementation-Plan.pdf;

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RE: Aurora Airport Master Plan Proceedings - email #9 of 9

Wendie Kellington <wk@klgpc.com>

Tue 9/3/2024 12:02 PM

To:BEACH Anthony <Anthony.BEACH@odav.oregon.gov>;THOMAS Alex R <Alex.R.THOMAS@odav.oregon.gov>;Brandy Steffen <brandy.steffen@jla.us.com>
Cc:SUGAHARA Kenji <Kenji.SUGAHARA@odav.oregon.gov>;brad.schuster@aopa.org <brad.schuster@aopa.org>; agertsen@nbaa.org <agertsen@nbaa.org>;Phil Derner (pderner@nbaa.org) <pderner@nbaa.org>;Ted Millar <tmillar@wwpmi.com>;Tony Helbling - Wilson Construction Company (helbling@wilsonconst.com) <helbling@wilsonconst.com>;Aron Faegre (faegre@earthlink.net) <faegre@earthlink.net>;Bruce Bennett - Aurora Aviation (bruce@auroraaviation.com) <bruce@auroraaviation.com>;Kevin Cameron - Marion County Board of Commisioners (kcameron@co.marion.or.us) <kcameron@co.marion.or.us>;benwest@clackamas.us <benwest@clackamas.us>;Rep Lewis <Rep.RickLewis@oregonlegislature.gov>;sen.fredgirod@oregonlegislature.gov <sen.fredgirod@oregonlegislature.gov>;Trent Brownlee (Trent.brownlee@atlanticaviation.com) <Trent.brownlee@atlanticaviation.com>;David Waggoner <dave@WillametteAir.com>;Eric Postma (epostma@bittner-hahs.com) <epostma@bittner-hahs.com>;Rachel Bacon <rb@klgpc.com>

Tony, Brandy, and Alex,

This is the last transmittal of comments from PAC Member Millar, TLM and AABC (collectively Millar) concerning the July 30, 2024, draft Aurora Airport Alternatives. Due to the size of the transmission it came to you in nine (9) parts. We transmitted the following to you today:

- The PAC Member form
- Letter
- Exhibits A-N

There are no further emails coming from this PAC member responding to the July 30, 2024, ODAV alternatives for the airport. Please note that email 5 of 9 transmitting Exhibits F-J was inadvertently named transmittal 4 of 9 rather than 5 of 9.

To summarize the attached and forthcoming transmittals with Millar's comments:

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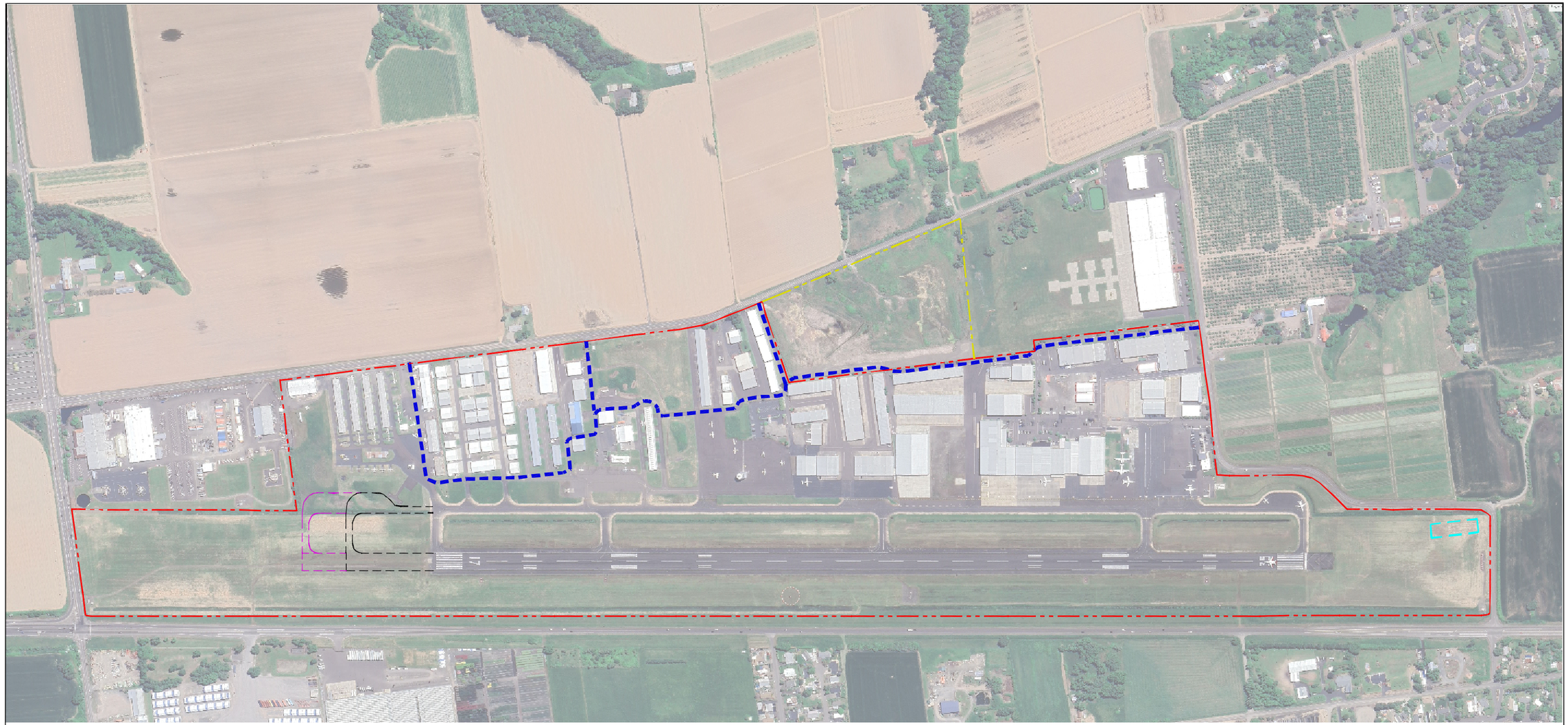
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KELLINGTON LAW GROUP

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NOTES:

1. Continue a Modifications of Standards for the Runway Object Free Area involved with Highway 551 and the west airport perimeter fence, as approved for the 2012 ALP..

SITE PLAN

0 200 400 600

N

KEY

- AIRPORT BOUNDARY
- AIRPORT BOUNDARY ADDITION
- INTERNAL PUBLIC ACCESS ROAD PER 2012 APPROVED ALP
- 500 FT RUNWAY EXTENSION
- 750 FT RUNWAY EXTENSION
- DRAINFIELD TO REMAIN WITH GEOTECH CERTIFICATION IN ACCORDANCE WITH WITH FAA STANDARDS

VERIFY SCALES

BAR IS ONE INCH ON ORIGINAL DRAWING. IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY.

0" 1"

NO.	DATE	BY	APPR.	REVISIONS

ARON FAEGRE AIRPORT PLANNING & DESIGN
13200 Fielding Road, Lake Oswego, Oregon 97034
(503) 880-1469 faegre@earthlink.net

DESIGNED BY:	DRAWN BY:	CHECKED BY:	SCALE:
AF	AF/JH	AF	300' = 1"

DATE: AUGUST 29, 2024

PROJECT: MP – MASTERPLAN ALTERNATIVE TLM

AURORA STATE AIRPORT (UAO)

AURORA STATE AIRPORT – MASTER PLAN ALTERNATIVE TLM

DRAWING

MP-TLM

Aron Faegre Airport Planning & Design 13200 Fielding Road Lake Oswego Oregon 97034 aron@faegre.org

Aurora State Airport (UAO)
Proposed Modification of
Runway Object Free Area (ROFA) Design Standards

Prepared by: Aron Faegre, AIA, PE
Aron Faegre Airport Planning & Design

August 29, 2024

This memorandum provides an analysis and methodology by which a Modifications of FAA Airport Design Standards (MOS) at the Aurora State Airport (UAO), for the Runway Object Free Area (ROFA) can be justified as:

> "… resulting in an acceptable level of safety, useful life, lower costs, greater efficiency, or the need to accommodate an unusual local condition on a specific project through approval on a case-by-case basis." - FAA Order 5300.1G, page 1.

as defined and permitted under FAA Order 5300.1G Modifications to Agency Airport Design, Construction, and Equipment Standards[1].

1. BACKGROUND

The Aurora State Airport is surrounded by farm lands, near Aurora, Oregon, at the northern end of Marion County. It primarily serves aviation businesses involved with:

- emergency medical transport[2],
- aviation heavy-lift helicopter fire-fighting and power line construction companies (for which fixed wing aircraft are essential for support),[3]
- business jets for numerous major national corporations based within 10 miles,
- aircraft manufacturing for the S-LSA (Special Light-Sport Aircraft) and kit-build

[1] FAA Order 5300.1G Appendix A specifically gives FAA Office of Airport (ARP) and Region the authority to issue a MOS for Runway Object Free Areas. The Order can be downloaded at: https://www.faa.gov/documentLibrary/media/Order/order-5300-1G-modifications-to-standards.pdf .
[2] Regional headquarters for Life Flight Network, with bases all over Oregon, Washington, Idaho, Montana, and Nevada.
[3] Columbia Helicopters, Helicopter Transport Services, Wilson Construction, companies that work internationally with headquarters at Aurora Airport. The use of the Aurora Airport runway is essential to these companies for rapid providing of crews, equipment, and repairs to helicopters in active service of fighting fires, moving power lines, or doing rescue, relief, or humanitarian work.

industry[4], and

- other general aviation aircraft using the airfield for business, pilot training, and recreational flying.

There is no scheduled air service using the airport. The State of Oregon Department of Aviation (ODAV) owns, governs, and manages the public lands of the airport. Most of the business aircraft based at the airport access the runway via through-the-fence permits with ODAV.

Flights by based business jets, such as a Challenger 300, dictate that the Airport Reference Code is C-II. Due to the geometry of the existing site, the airport does not meet current FAA design standards for the ROFA, due primarily to adjacent Highway 551 to the west of the runway.

Most recently ODAV's planned solution[5] to meeting these standards ("Refined Preliminary Alternatives Summary", by Century West Engineering, dated July 31, 2024) is one of only two options:

- relocate the highway further west, (which involves acquiring both private residential and commercial properties further west), or
- relocate the runway, taxiway, and control tower east (which involves acquiring many acres of existing private property already developed with hangars, taxilanes, and aprons for aviation uses) and demolishing numerous large 40,000 square foot aviation hangars along the taxiway.

Both options have very high financial and environmental costs (probably in the greater than $100 million range), which would make them difficult to ever be implemented. If this master plan is approved as currently planned, and one of these options were not implemented, then ODAV and FAA have reported that the airport would only receive maintenance funding and no additional safety improvement funds. This would result in the airport not keeping pace with the aviation industry standards of safety. The second option (moving the runway, control tower, and demolishing hangars), If implemented, would in addition force closure of many of the major medical transport and fire-fighting facilities on the airport, and would put many of the airport's 1,500 employees out of jobs.

It is noted that in the 2012 Airport Layout Plan (ALP), approved (signed) by both ODAV and FAA, the airport also had the same Runway Design Code (RDC) status of C-II and

[4] Van's Aircraft www.vansaircraft.com the international leader in S-LSA produced aircraft.
[5] Refined Preliminary Alternatives Summary document dated July 31, 2024 by Century West Engineer can be downloaded at: https://publicproject.net/files/UAOAMP/uao-refined-preliminary-alternatives-summary-1-.pdf?d952c4adef .

listed a MOS as the solution to the non-standard ROFA limitation on the west property line. At that time there was consensus between ODAV and FAA that a MOS was a reasonable solution.

This memorandum provides the evidence to show that the 2012 ALP was a good approach to resolution of the ROFA, and that it can reasonably be continued. This report demonstrates that there is an acceptable level of safety through modifying the ROFA standard for the specific deviation to standards located on the west side of the runway.

FAA standards for different airports ROFA's vary from 250 foot width, to an 800 foot width, depending on aircraft type using the airport. As will be shown below, the primary reason justifying the modification is that the going from B-II to C-II category is just where the 500-foot required ROFA width changes to an 800-foot wide required ROFA - yet this is the same width required for all RDC category aircraft all the way to E-VI -Portland International Airport, San Francisco Airport, and every other international airport in the country. UAO will never have the larger size of aircraft those airports accommodate – Boeing 737's to Boeing 777's – so a slight reduction in width on the west side provides a level of safety appropriate for UAO, which will always serve only much smaller aircraft.

Modifications of standards for ROFA's are common at even large national airports. For example, recently several MOS were adopted at San Jose International Airport for deficiencies in the ROFA, as well as for runway-taxiway separations, and for runway object free areas[6]. It even appears that Portland International Airport (PDX) may have their airport perimeter fence, the shoulder of NE Marine Drive, and improper grading within the 400-feet area from runway centerline, at the northeast corner of the ROFA for Runway 10L.

This memorandum provides the detailed technical background and mathematically calculated justification, needed for the FAA and ODAV to again approve a MOS for the ROFA at Aurora State Airport.

2. MOS PROCESS

The process for gaining a modification of standards is provided in FAA AC 150/5300-13B Airport Design[7] in Section 2.8. It states, and we provide commentary after each paragraph as to acceptability:

[6] Norman Y. Mineta San Jose International Airport Runway Incursion Mitigation/Airfield Design Standards Analysis, November 27, 2017. Justification for ROFA modifications in this document were often simply the practical and cost issues of modifying major adjacent highways, similar to what is at issue in a much smaller Aurora Airport.
[7] FAA AC 150/5300-13B Airport Design Available free on line at:
https://www.faa.gov/documentLibrary/media/Advisory_Circular/AC-150-5300-13B-Airport-Design-Chg1.pdf

2.8 ***Modification of Standards.***

Site-specific conditions may make it impractical to meet all FAA design standards at an airport. The FAA considers, on a case-by-case basis, modifications to design standards that result in an acceptable level of safety and efficiency. Specific operational controls may be necessary to establish an acceptable level of safety for operation of aircraft at the airport. FAA Order 5300.1 establishes FAA policy for administering airport requests for modification of standards. See paragraphs 2.4 and 2.5.

This memorandum provides this information and finds that no specific operational controls are necessary, see comments on paragraph 2.4 below.

2.8.1 The FAA views an approved modification of standards as an interim measure intended to mitigate unique site-specific conditions. Unless the FAA explicitly states otherwise in the approval action, the FAA expects airports with approved modifications to pursue ways to meet design standards. This may occur incrementally over time or at such time it becomes practical to correct the non-standard condition.

The FAA and ODAV can work with Oregon Department of Transportation on master planning future revisions to State Highway 551 so that it can be corrected "at such time it becomes practical." Also, there are potential options where ODAV and ODOT could jointly agree to relocate the airport perimeter fence closer to Highway 551, which could be an "incrementally" established improvement.

2.8.2 The FAA will not consider any request to modify design standards associated with the following:

- *RSA dimensions*
- *OFZ dimensions*
- *Approach or departure surface dimensions*
- *Standards established within a regulation (e.g., stopway, clearway).*

The ROFA is not one of these.

2.8.3 An airport seeking FAA approval of modification to a design standard submits a request using the Modification of Standards application tool within the Airport Data and Information Portal (ADIP) at https://adip.faa.gov. The FAA relies on the following information, in part, to determine the acceptability of a modification to FAA design standards:

- *Information on the standard proposed for modification.*
- *Description of proposed modification and why the airport cannot meet standards.*
- *Statement addressing how modification will provide an acceptable level of safety, economy, durability, and workmanship.*
- *Listing of any special operational measures necessary to accommodate the modification.*

This document was prepared to provide the analysis needed for ODAV to submittal for the MOS per Section 2.4.

2.4 Addressing Non-standard Airport Conditions.

> *The FAA expects airport owners to address non-standard conditions through the airport planning process. The FAA acknowledges that conformance to current standards is not always practical. However, the FAA expects airports to continue to investigate mitigation measures, whether in one or multiple phases, and correct the non-standard conditions over time.*

It is important to re-emphasize the above statement, that the FAA here "acknowledges that conformance to current standards is not always practical." Further, per this paragraph, the current master planning activity is the appropriate place for this analysis and the formal establishment of a MOS for the ROFA. This report and analysis identifies intermediate steps that can be taken, such as relocating the airport perimeter fence, that will iteratively move the airport closer to compliance.

This analysis utilizes an FAA established safety analysis methodology to show that the MOS provides an acceptable level of safety. The study found no special measures needed to accommodate the modification.

3. METHODOLOGY

In 2011, the Transportation Research Board (TRB) released Airport Cooperative Research Program (ACRP) Report #51 – Risk Assessment Method to Support Modifications of Airfield Separation Standards. The ACRP is funded by the Federal Aviation Administration (FAA). Report #51 is used to support the ROFA MOS requested at Aurora State Airport.

The proposed ROFA MOS is modeled in this report in accordance with Appendix A – Risk Assessment Methodology of ACRP Report #51[8].

This report uses risk plots, along with the annual number of operations, to analyze the cumulative risks associated with Runway to Object Separations. The operations numbers at UAO are taken from the current draft Master Plan, and are numbers already approved by the FAA in a letter[9] to ODAV dated November 15, 2023 (corrected January 23, 2024). For sake of a conservative analysis, we are using the most distant forecast projects for the year 2041, which are:

- 90,231 total operations all RDC categories, of which
- 862 operations are of RDC C-II and D aircraft

[8] ACRP Report #51 – Risk Assessment Method to Support Modifications of Airfield Separation Standards is available free on line at: https://nap.nationalacademies.org/catalog/14501/risk-assessment-method-to-support-modification-of-airfield-separation-standards

[9] Federal Aviation Administration (FAA) Aurora (UAO Aviation Activity Forecast Approval Airport Improvement Program Grant Number 3-41-0004-022-2021 available at: https://publicproject.net/files/2024-01/Aurora-Airport/uao-forecast-approval-20231115-corrected-20240123.pdf?57af6c19b7

For operations involving the runway, per the methods of Report #51, the risk is analyzed based on three distinct phases of flight:

a. Landing - Airborne Phase
b. Landing - Ground Phase
c. Takeoff

The separation distance from the runway centerline to an object is used with the associated risk plot to calculate the risk of collision per operation.

The risk of collisions per operation is then analyzed along with the number of annual airport operations for the appropriate phase of flight to determine the predicted frequency of occurrence. The frequency of occurrence is used to determine the FAA likelihood level using Table A-3 from ACRP Report #51 which is shown below:

Table A-3. FAA likelihood levels (FAA, 2010).

	General	Airport Specific	ATC Operational	
			Per Facility	NAS-wide
Frequent A	Probability of occurrence per operation is equal to or greater than 1×10^{-3}	Expected to occur more than once per week or every 2,500 departures (4×10^{-4}), whichever occurs sooner	Expected to occur more than once per week	Expected to occur every 1–2 days
Probable B	Probability of occurrence per operation is less than 1×10^{-3}, but equal to or greater than 1×10^{-5}	Expected to occur about once every month or 250,000 departures (4×10^{-6}), whichever occurs sooner	Expected to occur about once every month	Expected to occur several times per month
Remote C	Probability of occurrence per operation is less than 1×10^{-5} but equal to or greater than 1×10^{-7}	Expected to occur about once every year or 2.5 million departures (4×10^{-7}), whichever occurs sooner	Expected to occur about once every 1–10 years	Expected to occur about once every few months
Extremely Remote D	Probability of occurrence per operation is less than 1×10^{-7} but equal to or greater than 1×10^{-9}	Expected to occur once every 10–100 years or 25 million departures (4×10^{-8}), whichever occurs sooner	Expected to occur about once every 10–100 years	Expected to occur about once every 3 years
Extremely Improbable E	Probability of occurrence per operation is less than 1×10^{-9}	Expected to occur less than once every 100 years	Expected to occur less than once every 100 years	Expected to occur less than once every 30 years

Note: Occurrence is defined per movement.

Source: ACRP Report #51

The key takeaway from Table A-3 is that for a specific airport, if the likelihood of incidence is less than once every 100 years it is considered a “Extremely Improbable” Class E occurrence.

A Hazard Severity Classification is then assigned based on the worst credible outcome of an incident. Since the ACRP method is based on wingtip separation, the report states that: “From the point of view of risk and based on the records of incidents and accidents,

the worst credible consequence expected for wingtip collisions of two taxiing aircraft is aircraft damage" (ACRP Report #51 page 19). A similar aircraft damage expectation would be a wingtip collision with the airport perimeter fence, which is the ROFA limitation examined in this report.

The Hazard Severity Classifications were determined in accordance with Table A-4 FAA Severity Definitions from ACRP Report #51 and are shown below:

Table A-4. FAA severity definitions (FAA, 2010).

Hazard Severity Classification				
Minimal 5	**Minor 4**	**Major 3**	**Hazardous 2**	**Catastrophic 1**
No damage to aircraft but minimal injury or discomfort of little consequence to passenger(s) or workers	- Minimal damage to aircraft; - Minor injury to passengers; - Minimal unplanned airport operations limitations (i.e. taxiway closure); - Minor incident involving the use of airport emergency procedures	- Major damage to aircraft and/or minor injury to passenger(s)/ worker(s); - Major unplanned disruption to airport operations; - Serious incident; - Deduction on the airport's ability to deal with adverse conditions	- Severe damage to aircraft and/or serious injury to passenger(s)/ worker(s); - Complete unplanned airport closure; - Major unplanned operations limitations (i.e. runway closure); - Major airport damage to equipment and facilities	- Complete loss of aircraft and/or facilities or fatal injury in passenger(s)/ worker(s); - Complete unplanned airport closure and destruction of critical facilities; - Airport facilities and equipment destroyed

Source: ACRP Report #51

Then, using both the FAA likelihood level and the Hazard Severity Classification the risk is then analyzed using Figure A-1 FAA Risk Matrix from ACRP Report #51, shown below:

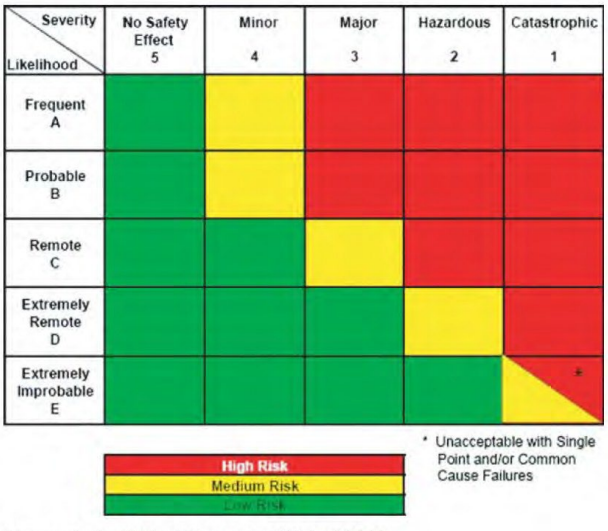


Figure A-1. FAA risk matrix (FAA, 2010).

Source: ACRP Report #51

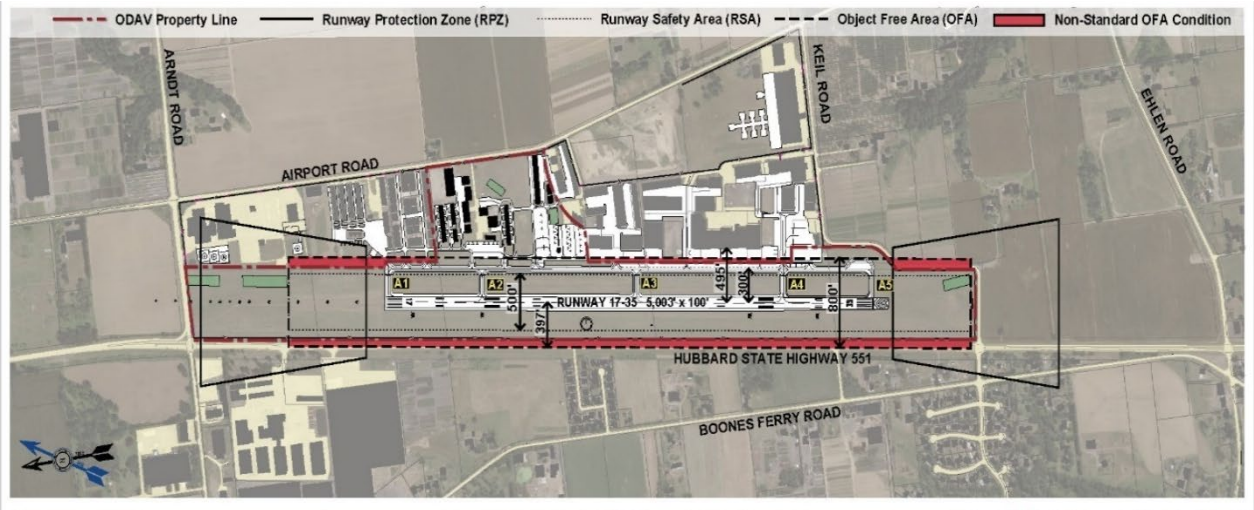
Based on Figure A-1 if the incident is Extremely Improbably (i.e. more than 100 years probability) the risk is considered “Low,” except for an incident considered catastrophic. We will use these graphs to evaluate the results from the detailed risk analysis of UAO below.

4. UAO ANALYSIS

In 2012 Master Plan and ALP established the UAO runway RDC, given existing based aircraft, as C-II, up from a B-II. The required ROFA width of a B-II runway is 500 feet centered on the runway. As it turns out, any runway of higher RDC than a B-II requires 800 feet in width. Thus, the UAO required C-II ROFA width is 800 feet centered on the runway. This 800-foot width is the standard used for aircraft ranging from a Challenger 300 business jet to the largest Boeing 777 or even the largest military aircraft. The 2012 approved ALP lists the ROFA deviation as a modification to standards, since the airport perimeter fence and Highway 551 were within the ROFA.

The UAO forecast of operations predicts that by the year 2041 there will be 90,230 annual operations at the airport, of which 862 would be an RDC above the B-II category. Thus, the 89,368 operations by B-II or lesser category clearly are operating well within ROFA safety standards, as the existing runway to road separations provide more than the 500-foot required width. It is just the 862 operations that need to be analyzed for ROFA safety relative to the required 800-foot width.

The deficiencies in the existing Runway OFA at UAO are shown in the Figure below:



UAO Figure A: Highway 551 Shown as ROFA Deviation Object
Source: Century West Engineers, Aurora State Airport Draft Airport Master Plan, Working Paper No. 1, Figure 2-15, November 2023 (Updated)

The current ROFA object deficiencies are:

d. Hubbard State Highway 551 for which the OFA penetrates 3 feet beyond the highway centerline. (368' to 377' clear width available from outer edge of highway gravel shoulder to Runway CL)
e. Perimeter Fence Inside OFA (312' clear width from Runway CL)

Potentially the airport fence could be relocated to the east edge of the 12-foot-wide gravel shoulder, since both the highway and the airport are owned by the State of Oregon. There can be an agreement between ODOT and ODAV to allow this. Relocating the fence in this way would result in a minimum width of the ROFA on the west side of the runway, to a 368-foot clearance - which would be only 32 feet out of conformance.

However, we will evaluate the ROFA for the existing conditions, and thus use the location of the airport perimeter fence as the maximum ROFA available at this time.

When analyzing the risk associated with a reduction in Runway OFA it is important to consider the purpose of the design standard. Paragraph 3.12 of Advisory Circular 150/5300-13B defines the ROFA but does not give detailed design rational behind the standard:

> *"ROFA is a clear area limited to equipment necessary for air and ground navigation, and provides wingtip protection in the event of an aircraft excursion from the runway"*

Appendix I, Paragraph I.8 of Advisory Circular 150/5300-13B provides the only available reference to the design rationale behind the Runway OFA width:

> *"The ROFA serves two principal purposes: 1. Development buffer in proximity to a runway, and 2. Wing clearance for a runway excursion event to the outer limit of the RSA. `*

Appendix I, in Section I.8.2, also clarifies that part of the "development buffer" intent is:

> *"Protection of the ROFA also reserves space for future development of a parallel taxiway that permits proper alignment of aircraft at a holding position on an entrance taxiway."*

However, for the given physical layout of UAO there can be no plan for a parallel taxiway on the west side of the runway, because of the location of Highway 551 and that there never can be hangars or other aviation uses on that side of the runway. Therefore, that leaves the only ROFA purpose for UAO as only "wingtip clearance for a runway excursion" which is precisely what this analysis provides.

Below we will analyze resolving the ROFA utilizing the risk analysis method of ACRP Report #51, for the case:

- No Change to existing ROFA conditions on West Side of Runway (Hwy 551 and Airport Perimeter Fence remain as existing) resulting in a 312-foot clearance to runway CL.

Per the methodology of ACRP Report 51, we analyze the risks for each of the takeoff and landing scenarios. For landing operations, the analysis is further divided into two parts: airborne (approach) phase and ground (landing rollout) phase. However, because the risk of veering off the runway during takeoff is so much less than for during landing, the methodology indicates that usually it is not necessary to evaluate takeoff option except if there are runways that only are used for takeoffs and not for landings. We will do that takeoff evaluation in any case, just to clearly determine what it is in the UAO context.

Since the existing runway to taxiway separation meets the current criteria for a C-II airport, for this study that analysis would seem unnecessary. However, we will include that option in this report because it provides a baseline of safety that the AC 150-5300-13B Airport Design Standards have determined is an acceptable and appropriate level of safety for a C-II airport.

Thus, for this UAO ROFA analysis separate risks are developed for each of:

1. Airborne Phase (Landing) is for instrument approaches which terminate the approach as a missed approach, and the risk is hitting another object such as hitting the airport perimeter fence or a vehicle on Highway 551 (using ACRP Report 51 Fig. 31); “the airborne risk is computed only for missed approaches” (ACRP Report 51, page 21).
2. Ground Phase (Landing Rollout) where risk is veering off the runway into the reduced width ROFA and hitting the fence or a car on Highway 551 (using ACRP Report 51 Fig 42). Figure 42 is based on the assumption that the risk is between the two wingtips of two aircraft, one aircraft on the edge of the runway and the other at the centerline of a taxiway. The ACRP makes clear that the x-axis distance on the Risk Figures are centerline of runway to centerline of taxiway because the risk is assumed aircraft to aircraft. However, the predicted risk is based on the wingtip-to-wingtip distance. When using the Risk Figures for objects (not aircraft) like a fence or road (which has no wings), half of the wingspan should be added to the distance to compensate for the wingtip-to-wingtip assumption. Thus, per Group II standards, the clearance distance used for Figure 42 should add half of 79 feet (equals 39.5 feet) of additional clearance, which would create a total of 351 feet to use in Fig. 42. The risk shown with the 312 feet and the 351 feet are each shown in figures.

3. Ground Phase (Takeoff) where risk is veering off the runway into the reduced width ROFA and hitting the fence or a car on Highway 551 (using ACRP Report 51 Fig 49).

Finally, to have more relevant data, we will also perform the risk analysis of the standard required 300-foot separation between runway centerline and taxiway centerline for a landing, which is the level of safety the AC 150/5300-13B sets for in a C-II airport:

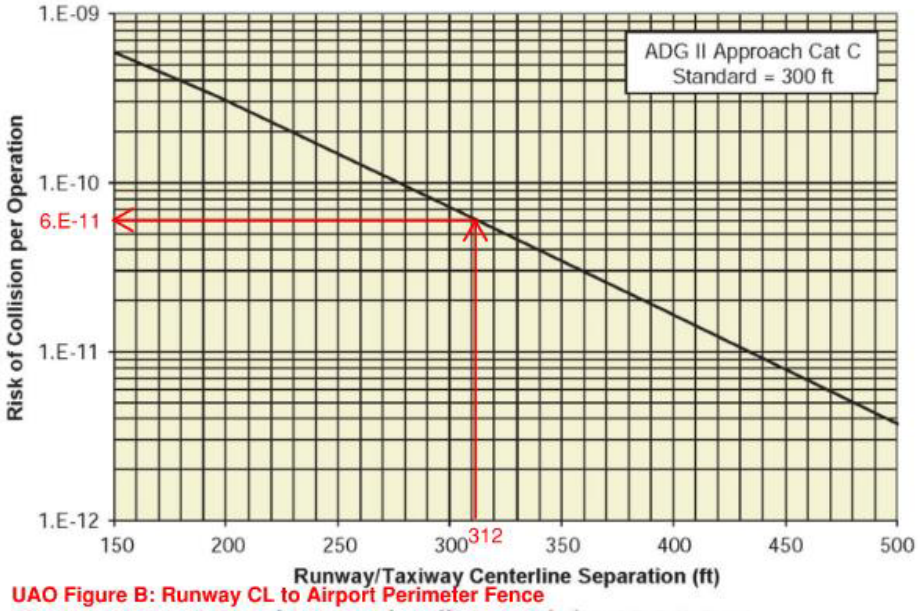
4. Ground Phase (Landing Rollout) where risk is veering off the runway into the taxiway (using ACRP Report 51 Fig 42).

This data will give us an example of an acceptable level of safety utilized in AC 150/5300-13B for a C-II airport.

5. Specific Analysis: Proposed MOS Option - No Change to Existing ROFA Conditions (312' Separation from Runway Centerline to Airport Fence)

The Perimeter Fence at the west side is located 312 feet from the runway centerline. The risks associated with leaving it there as a modification of standards, for each of the phases of flight are analyzed below:

1. Airborne Landing Phase Risk from Reduced ROFA – For a very conservative analysis we will assume that this includes all approach to landings, not just missed approaches. Using the separation of 312' and Figure AA-33 in Appendix A of ACRP Report #51, the following provides a risk level 6.0E-11 of occurrence per landing (which as an inverse, is one chance in a 16.7 trillion landings) that an aircraft gets 312' from the runway centerline. This can be seen in the figure below:

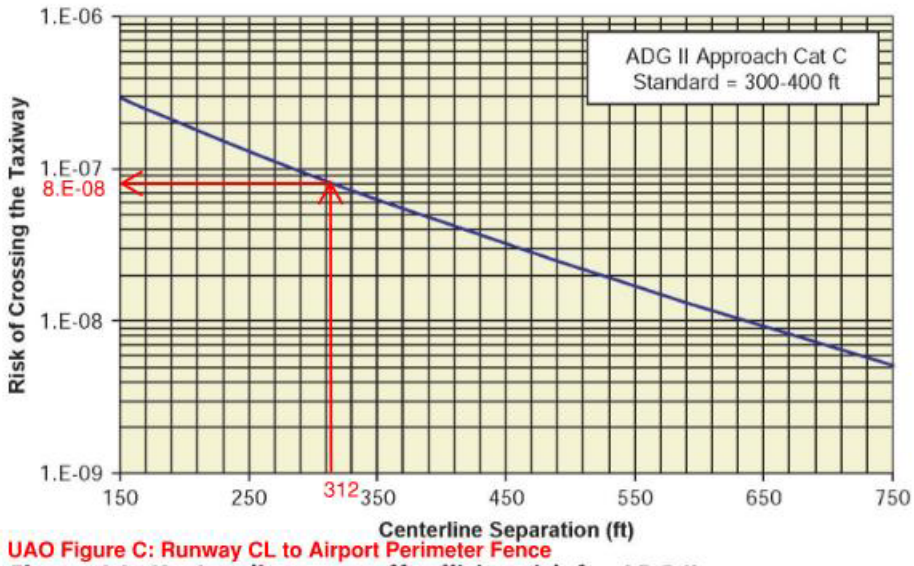


UAO Figure B: Runway CL to Airport Perimeter Fence

Figure AA-31. Missed approach collision risk for ADG II Cat I.

The current annual number of landing operations at UAO is approximately 45,115 or half of the 90,230 annual operations. As the risk is one incident in every 16.7 trillion landings, the time between occurrences is calculated as 16 trillion landings divided by 45,115 landing operations per year which equates to one incident every 369,000 years. Thus, this risk is of no significance.

2. Landing Roll Phase Risk for Reduced ROFA - Using the separation of 312' and Figure AA-43 in Appendix A of ACRP Report #51, provides a risk level 8.0E-08 or in the inverse: one chance in 12.5 million landings. This can be seen in the figure below:



UAO Figure C: Runway CL to Airport Perimeter Fence

Figure AA-42. Landing veer-off collision risk for ADG II.

As the risk is one incident in every 12.5 million landings, the rate of occurrence is calculated as 12.5 million landings divided by 45,115 landings per year which equates to one incident every 277 years.

Using the ACRP described adjustment when the object is not another aircraft and half the C-II wingspan can be added to the clearance distance, results in a separation of 351' and Figure AA-43 in Appendix A of ACRP Report #51, provides a risk level 6.0E-08 or one chance in 16.7 million landings. This can be seen in the figure below:

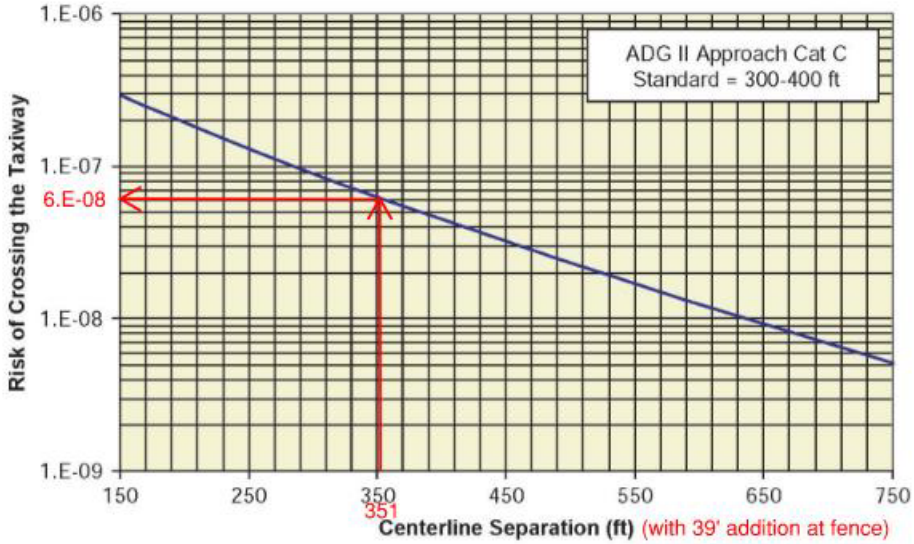
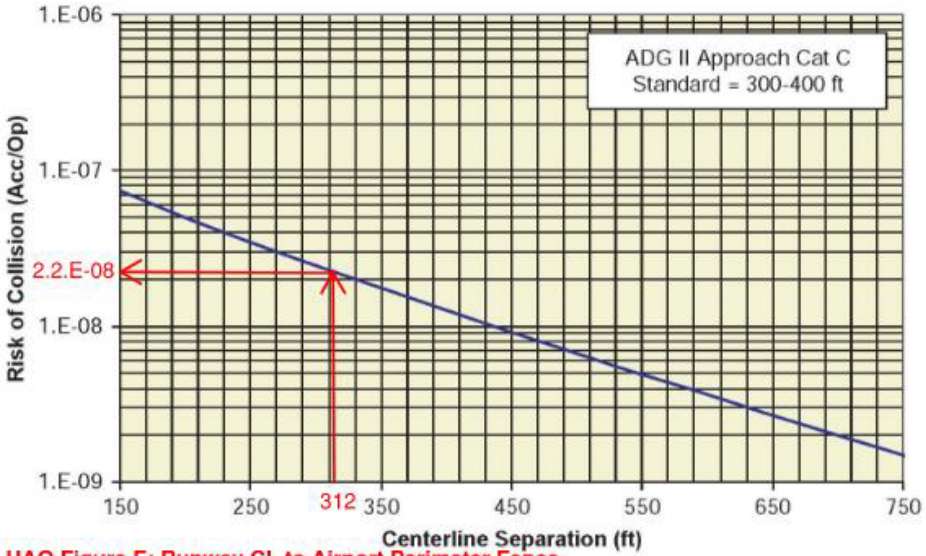


Figure AA-42. Landing veer-off collision risk for ADG II.
UAO Figure D: Runway CL to Airport Perimeter Fence Including Wingspan adjustment

As the risk is one incident in every 16.7 million landings, the rate of occurrence is calculated as 16.7 million landings divided by 45,115 landings per year which equates to one incident every 369 years.

3. Takeoff Roll Phase Risk for Reduced ROFA - Using the separation of 312' and Figure AA-49 in Appendix A of ACRP Report #51, provides a risk level 2.2E-08) or one chance in 45.5 million takeoffs. This can be seen in the figure below:

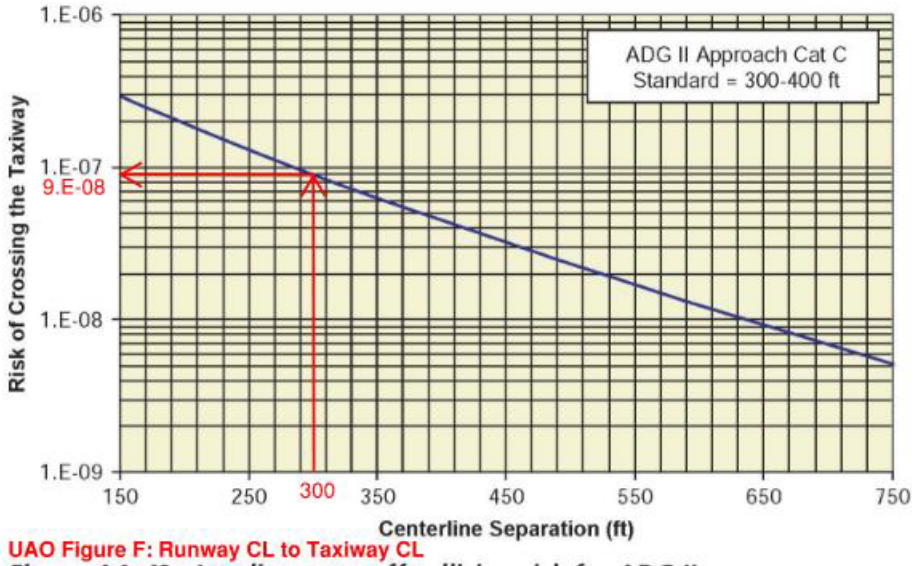


UAO Figure E: Runway CL to Airport Perimeter Fence
Figure AA-49. Takeoff veer-off collision risk for ADG II.

As the risk is one incident in every 45.5 million takeoffs, the rate of occurrence is calculated as 45.5 million takeoffs divided by 45,115 takeoffs per year which equates to one incident every 1,008) years.

Finally, as a test of the level of safety that AC 150/5300-13B considers acceptable we check what the predicted risk level is of the existing runway-taxiway separation considered appropriate[10] by FAA.

4. Landing Roll Phase Risk to Taxiway Consistent with Safety Standards of AC 150/5300-13B - Using the separation of 300' and Figure AA-43 in Appendix A of ACRP Report #51, provides a risk level 9.0E-08 or one chance in 11.1 million landings. This can be seen in the figure below:



UAO Figure F: Runway CL to Taxiway CL

Figure AA-42. Landing veer-off collision risk for ADG II.

As the risk is one incident in every 11.1 million landings, the rate of occurrence is calculated as 11.1 million landings divided by 45,115 landings per year which equates to one incident every 246 years.

[10] Note that Section 3-24 of Order 5100.38D Change 1 states that the FAA will not fund airport safety greater than that in the Airport Design standards, so the standard set by the runway-taxiway separation is a significant number. Order 5100.38D Change 1 can be downloaded for free at: https://www.faa.gov/documentLibrary/media/Order/AIP-Handbook-Order-5100-38D-Chg1.pdf

6. Conclusions

Considering the risk of each phase of flight, the risk of collision during the landing roll is the controlling factor. The Hazard Severity Classification for this type of operation would be major and the acceptable probability of occurrence is remote (1E-05) or less than once every 1-10 years. The following table summarizes the risk associated with each phase of flight:

Phase of Flight	Rate of Occurrence	Acceptable Level
Airborne Phase	Once every 369,000 years	Yes
Landing Roll Phase	Once every 277 years (or 369 years with calculation adjustment for fence object in lieu of wing object)	Yes
Takeoff Roll Phase	Once every 1,000 years	Yes

A runway to object separation of 312’ provides an acceptable level of safety as the controlling occurrence is once every 277 years (or 369 years with the adjustment for wingspan at the fence as allowed in the ACRP method). This is much less risk than the once per 100 years FAA standard shown in Table A-3 and results in a Category E “Extremely Improbable” occurrence. Further, per ACRP’s method, a wingtip to fence occurrence is considered by ACRP’s method to be a Table A-4 Minimal Severity occurrence. This combination via Figure A-1 concludes that the outcome as Low Risk.

Figure UAO F shows that the existing risk of occurrence between the existing runway and existing taxiway, which fully meets FAA standards, is one in every 246 years. This means that the risk to an occurrence at the taxiway, is much less (i.e. longer duration between events) than the FAA’s 100-year standard. The risk of collision with the perimeter fence is then even much less than that of a taxiway collision.

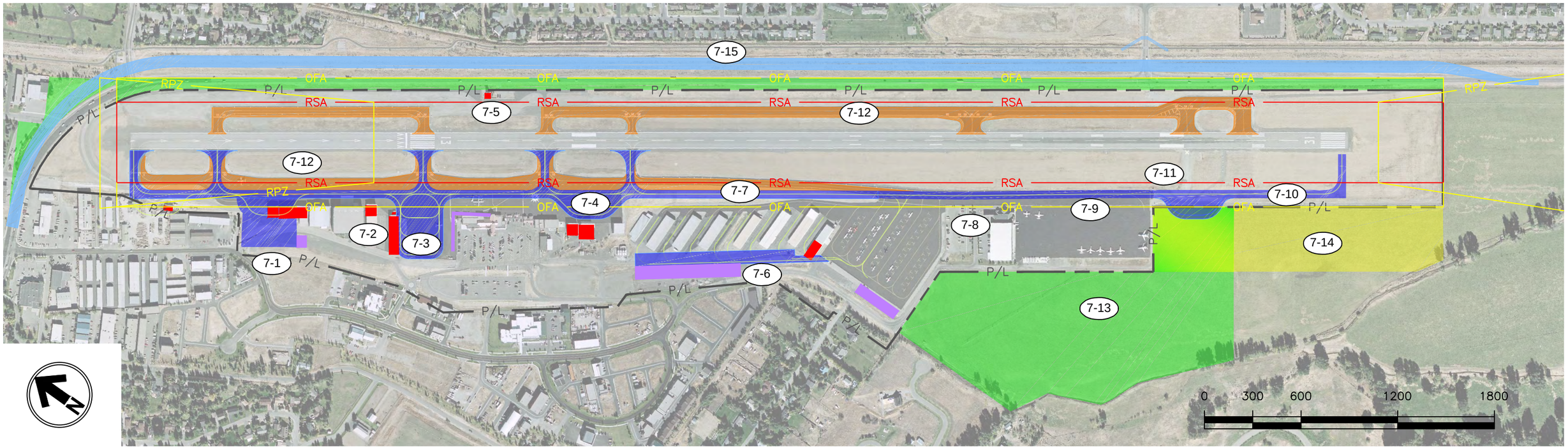
Finally, there is an incremental improvement option of ODAV and ODOT coming to an agreement to move the perimeter fence further west, to the east edge of the 12’ wide gravel shoulder, which would result in a 368-foot separation. If the 39.5-foot wing span correction is added at the new fence location, this results in an equivalent distance of 407 feet for use on Figure AA-42. That in turn would result in an ACRP predicted probability occurrence being once every 515 years, almost half the risk of a taxiway collision.

Given that the commercial use of aviation is itself only around 100 years old, these numbers of one predicted occurrence at the existing airport fence every 277 or 369 years, demonstrates the high level of safety that will be maintained at Aurora Airport with this MOS.

Given the regional and national importance of Aurora Airport for emergency medical, firefighting, and emergency power line moving, along with the use by local national corporations, using the MOS ensures the airport can continue to upgrade with safety improvements, and can continue to support the approximately 1,500 employees that rely on the airport for their livelihood.

This study shows definitively that the 2012 signing off on the Aurora Airport master plan and ALP with a modification of standards for the ROFA, by FAA and ODAV, was a reasonable and appropriate action to take. The same action should be taken for the current 2024 master plan work.

Author: Aron Faegre is an architect, civil engineer, physicist, and pilot who has been the lead planner and designer on over two hundred airport planning and development projects in Oregon, Washington, California, New York, and British Columbia over the past 35 years. He has a Master of Architecture from MIT and a Bachelor of Physics from Reed College.



ITEM	DESCRIPTION
7-1	RELOCATE HANGARS, RELOCATE DE-CONFLICTION, CONSTRUCT APRON FOR FED EX AND UPS, CLOSE WINTER BUS ROUTE
7-2	REMOVE HANGARS, RELOCATE ELECTRICAL VAULT
7-3	RELOCATE TERMINAL AIRCRAFT PARKING
7-4	RELOCATE HANGARS AND DE-CONFLICTION APRON
7-5	RELOCATE AIR TRAFFIC CONTROL TOWER
7-6	NEW TAXILANE TO ACCESS T- HANGARS
7-7	RELOCATE TAXIWAY B
7-8	RELOCATE EXISTING FBO FENCE AND PORTION OF PARKING LOT OUTSIDE OF TAXIWAY OFA

ITEM	DESCRIPTION
7-9	LOSS OF PARKING DURING HIGH DEMAND: 79,000 SF
7-10	EXTEND TAXIWAY B
7-11	RELOCATE AWOS
7-12	REMOVE EXISTING PAVEMENT AND GRADE RSA
7-13	OPTION A: ACQUIRE 36 ACRES FOR STORM DRAINAGE RETENTION POND, RELOCATED AIRCRAFT HANGARS AND APRON
7-14	OPTION B: ACQUIRE 17 ACRES FOR STORM DRAINAGE RETENTION POND, RELOCATED AIRCRAFT HANGARS AND APRON
7-15	ACQUIRE 15 ACRES OF HIGHWAY 75 ROW FOR RUNWAY OFA

AIRCRAFT PARKING IMPACTS

FBO:	-39,000 SF
GENERAL AVIATION:	-95,000 SF
TERMINAL APRON:	+41,200 SF
AIR CARGO APRON:	-88,500 SF
NET DIFFERENCE:	-181,300 SF

POTENTIAL MODIFICATIONS REQUIRED

AIRPORT DESIGN STANDARD	STANDARD DIMENSIONS	POTENTIAL MODIFICATIONS REQUIRED AS SHOWN
RUNWAY TO PARALLEL TAXIWAY SEPARATION	400'	320'
RUNWAY TO AIRCRAFT PARKING	500'	400'
RUNWAY OFA GRADING	10:1	4:1
RUNWAY OFA CLEARING	NO FIXED OBJECTS	HWY 75/BUILDINGS AT NE CORNER
TAXIWAY OBJECT FREE AREA	186'	160'

LEGEND

- 7-1 — KEY NUMBER
- NEW AIRFIELD PAVEMENT
- AIRFIELD PAVEMENT REMOVAL
- NEW BUILDING / HANGAR / STRUCTURE AREA
- BUILDING / HANGAR / STRUCTURE REMOVAL
- NEW LAND ACQUISITION - OPTION A
- NEW LAND ACQUISITION - OPTION B
- RELOCATED HIGHWAY

NOTES

1. PROPERTY ACQUISITION SHOWN REFLECTS AN ASSUMED PARCEL FOR ACQUISITION. ALTERNATE CONFIGURATION MAY BE PREFERABLE TO LANDOWNER.

EXHIBIT 5-7
ALTERNATIVE 7 - MODEST LAND ACQUISITION

Table 5-7 – Alternative 7 – Modest Expansion

RDC C-III ≥1 Mile	MEETS STANDARDS?	DISPOSITION/COMMENTS
RUNWAY PROTECTION STANDARDS		
Runway Safety Area (RSA)	Yes	• Meets RSA grading and dimensional standards. Dimensional standards met with the removal of Taxiway A on the east side and relocation of Taxiway B on the west side.
Runway Object Free Area (OFA) – dimensional standards Runway Object Free Area (OFA) – grading standards Taxiway Object Free Area (TOFA)	Yes No – MOS Required No – MOS Required	• Relocation of Highway 75 and bike path to the east provides for a fully compliant OFA. • Requires the acquisition of 15 acres of land to relocate Highway 75 and bike path Right-of-Ways (ROW). • Requires removal and relocation of Air Traffic Control Tower (ATCT). • MOS for runway OFA grading and aircraft specific TOFA.
Object Free Zone (OFZ)	Yes	• Provides fully compliant OFZ
Runway Protection Zone (RPZ)	No	• Portions of Highway 75 remain in RPZ on both ends (may be allowable with FAA approval). • Land acquisition required to accommodate RPZ on Runway 31 end.
SEPARATION STANDARDS		
Centerline to Holdline(s)	Yes	• Fully compliant at 250 feet
Centerline to Parallel Taxiway	No – MOS Required	• Taxiway A – Removed. 320-330 foot runway to Taxiway B centerline – Requires MOS.
Centerline to Aircraft Parking	No – MOS Required	• Requires MOS. Existing separation 400 feet – standard is 500 feet.
MAJOR ENVIRONMENTAL CONSIDERATIONS		
Compatible Land Use Wetlands	N/A	• 41 acres of land acquisition, including the acquisition of some ranch land and land for Highway 75 ROW may have adverse environmental impacts based on these impact categories.
OTHER		
Compliance and Infrastructure	N/A	• Requires the use of MOS. Results in loss of current hangars, aircraft parking and snow storage. Replacement of lost facilities can be recovered on acquired land.
Schedule (including planning/ environmental/land acquisition/construction)	N/A	**Maximum** 3 years (2013-2015). **MUST BE IMPLEMENTED IMMEDIATELY TO MEET RSA DEADLINE.**
COST ESTIMATE		**$59,500,000**

APPENDIX A

SUN CURRENT FAA FORM 5010-1

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION

AIRPORT MASTER RECORD

PRINT DATE: 01/12/2012
AFD EFF: 11/30/2012
Form Approved OMB 2120-0015

1 ASSOC CITY: HAILEY | 4 STATE: ID | LOC ID: SUN | FAA SITE NR: 10394.*A
2 AIRPORT NAME: FRIEDMAN MEMORIAL | 5 COUNTY: BLAINE ID
3 SEC TO AIRPORT (NM): 01 SE | 6 REGION/ADO: ANM/SEA | 7 SECT ARO/CHT: SALT LAKE CITY

GENERAL

10 OWNERSHIP: PU
11 OWNER: CITY OF HAILEY
12 ADDRESS: BLAINE CO - BOX 306
HAILEY, ID 83333
13 PHONE NR: 208 788-5500
14 MANAGER: RICHARD R BAIRD
15 ADDRESS: P.O. BOX 429
HAILEY, ID 83333
16 PHONE NR: 208 788-4995
17 ATTENDANCE SCHEDULE:
ALL ALL DAWN-DUSK

18 AIRPORT USE: PUBLIC
19 ARPT LAT: 43-30-12.660N ESTIMATED
20 ARPT LONG: 114-17-44.080W
21 ARPT ELEV: 5312.0 SURVEYED
22 ACREAGE: 241
23 RIGHT TRAFFIC:
24 NON-COMM LANDING: YES
25 NPIAS/FED AGREEMENTS: N
26 FAR 139 INDEX: A

SERVICES

70 FUEL: 100LL A1+
71 AIRFRAME RPRS: MAJOR
72 PWR PLANT RPRS: MAJOR
73 BOTTLE OXYGEN: HIGH
74 BULK OXYGEN: HIGH
75 TSNT STORAGE: HGR, TIE
76 OTHER SERVICES:
APPT, AMB, CARGO, CHTR, UNSTR, CNTL, RADES

FACILITIES

27 ARPT BCN: SS
28 ARPT LGT SKED: SEE RMK
29 UNICOM: 122.950
30 WIND INDICATOR: YES-L
31 SEGMENTED CIRCLE: NONE
32 CONTROL TWR: YES
33 FSS: BOISE
34 FSS ON ARPT: NO
35 FSS PHONE NR:
36 TOLL FREE NR: 1-800-WX-BRIEF

BASED AIRCRAFT

80 SINGLE ENG: 101
81 MULTI ENG: 35
82 JET: 11
TOTAC: 147
83 HELICOPTERS: 1
84 GLIDERS: 1
85 MILITARY: 1
86 ULTRA-LIGHT: 2

OPERATIONS

100 AIR CARRIER: 1,836
102 AIR TAXI: 11,685
103 G.A. LOCAL: 1,408
104 G.A. ITINERT: 22,081
105 MILITARY: 50
TOTAL: 34,237
OPERATIONS FOR 12 MONTHS ENDING: 12/31/2011

RUNWAY DATA

30 RUNWAY IDENT:	13/31		
31 LENGTH:	7,800		
32 WIDTH:	100		
33 SURF TYPE-COND:	ASPH-G		
34 SURF TREATMENT:	GRVD		
35 GROSS WT: SW	85.0		
36 GROSS WT: DW	165.0		
37: DTW	450.0		
38: DDTW			
39 PCN:			
LIGHTING/APCH AIDS			
40 EDGE INTENSITY:	HIGH		
42 RVR, MARK TYPE-COND:	RPI-15 / PIR-F		
43 VGSI:	P2L		
44 TVDC CROSSING HGT:	1,555		
45 VISUAL GLIDE ANGLE:	3.50		
46 CNTRLN-TDZ:			
47 RVR-RVV:			
48 REIL:			
49 APCH LIGHTS:			
OBSTRUCTION DATA			
50 FAR 77 CATEGORY:	B/V / E		
51 DISPLACED THR:	1,701 /		
52 CTLG OBSTN:	ROAD / TREE		
53 OBSTN MARKED/LGTD:	C /		
54 HGT ABOVE RWY END:	17 / 64		
55 DIST FROM RWY END:	200 / 1800		
56 CNTRLN OFFSET:	180' / 900'		
57 OBSTN CLNC SLOPE:	34:1 / 21:1		
58 CLOSE-IN OBSTN:	Y / N		
DECLARED DISTANCES			
60 TAKE OFF RUN AVBL (TORA):	7,450 / 5,950		
61 TAKE OFF DIST AVBL (TODA):	7,550 / 7,550		
62 ACLT STOP DIST AVBL (ASDA):	7,150 / 5,631		
63 LNDG DIST AVBL (LDA):	5,450 / 5,631		

C1 ARPT MGR PLEASE ADVISE FSS IN ITEM 35 WHEN CHANGES OCCUR TO ITEMS PRECEDED BY C

REMARKS

A 001 TPA - 1,000(A)
A 002 BLACK DIAMOND RWY 31 CLOSED TO ACFT WEIGHING MORE THAN 12,500 LBS.
A 003 ACFT WITH MAX CERT TKOF WT OF 12,500 LBS OR LESS MAY USE RWY 31 WITH 1,000 FT REDUCTION IN LENGTH.
A 004 ACFT WITH MAX CERT TKOF WT OF 12,500 LBS OR LESS MAY USE RWY 13 WITH 1,000 FT REDUCTION IN LENGTH.
A 005 RWY 13 DISPLACED THR 1,701 FT FOR ACFT WEIGHING MORE THAN 12,500 LBS.
A 006 RWY 31 DISPLACED THR 1,701 FT FOR ACFT WEIGHING MORE THAN 12,500 LBS.
A 007 RWY 13 DISPLACED THR 1,701 FT FOR ACFT WEIGHING MORE THAN 12,500 LBS.
A 008 RWY 31 DISPLACED THR 1,701 FT FOR ACFT WEIGHING MORE THAN 12,500 LBS.
A 009 RWY 13 DISPLACED THR 1,701 FT FOR ACFT WEIGHING MORE THAN 12,500 LBS.
A 010 RWY 31 DISPLACED THR 1,701 FT FOR ACFT WEIGHING MORE THAN 12,500 LBS.
A

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION

AIRPORT MASTER RECORD

AFD EFF 09/30/2010
Form Approved OMB 2120-0010

1 ASSOC CITY: CONTINUED 4 STATE: ID LOC ID: SUN FAC SITE NR: 04109.A
2 AIRPORT NAME: 5 COUNTY:
3 OBS TO AIRPORT (NM): 6 REGION/ADO: ANM/BOI 7 SECT AERO CHT:

GENERAL

10 OWNERSHIP:
11 OWNER:
12 ADDRESS:

13 PHONE NR:
14 MANAGER:
15 ADDRESS:

16 PHONE NR:
17 ATTENDANCE SCHEDULE:

18 AIRPORT USE:
19 ARPT LAT:
20 ARPT LONG:
21 ARPT ELEV:
22 ACREAGE:
23 RIGHT TRAFFIC:
24 NON-COMM LANDING:
25 # PAVED AGREEMENTS:
26 FAR 139 INDEX:

RUNWAY DATA

30 RUNWAY IDENT:
31 LENGTH:
32 WIDTH:
33 SURF TYPE-COND:
34 SURF TREATMENT:
35 GROSS WT: SW
36 (IN THDS) DSW
37 DTW
38 DDTW
39 PCN:

LIGHTING/APCH AIDS

40 EDGE INTENSITY:
42 RWY MARK TYPE-COND:
43 VGSI:
44 THR CROSSING HGT:
45 VISUAL GLIDE ANGLE:
46 CNTRLN-TDZ:
47 RVR-RVV:
48 REIL:
49 APCH LIGHTS:

OBSTRUCTION DATA

50 PART 77 CATEGORY:
51 DISPLACED THR:
52 CTLG OBSTN:
53 OBSTN MARKED/LGTD:
54 HGT ABOVE RWY END:
55 DIST FROM RWY END:
56 CNTRLN OFFSET:
57 OBSTN CLNC SLOPE:
58 CLOSE-IN OBSTN:

DECLARED DISTANCES

60 TAKE OFF RUN AVBL (TORA):
61 TAKE OFF DIST AVBL (TODA):
62 ACLT STOP DIST AVBL (ASDA):
63 LNDG DIST AVBL (LDA):

SERVICES

70 FUEL:

71 AIRFRAME RPRS:
72 PWR PLANT RPRS:
73 BOTTLE OXYGEN:
74 BULK OXYGEN:
75 TSNT STORAGE:
76 OTHER SERVICES:

FACILITIES

80 ARPT BCN:
81 ARPT LGT SKED:
82 UNICOM:
83 WIND INDICATOR:
84 SEGMENTED CIRCLE:
85 CONTROL TWR:
86 FSS:
87 FSS ON ARPT:
88 FSS PHONE NR:
89 TOLL FREE NR:

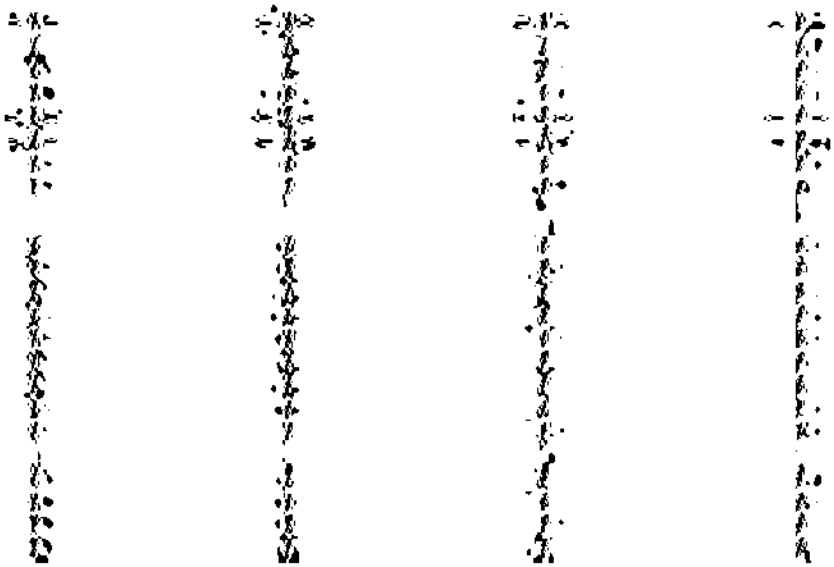
BASED AIRCRAFT

90 SINGLE ENG:
91 MULTI ENG:
92 JET:
TOTAL:
93 HELICOPTERS:
94 GLIDERS:
95 MILITARY:
96 ULTRA-LIGHT:

OPERATIONS

100 AIR CARRIER:
102 AIR TAXI:
103 GA LOCAL:
104 GA ITNRNT:
105 MILITARY:
TOTAL:

OPERATIONS FOR 12 MONTHS ENDING:



ATTN: FOR PLEASE ADVISE FSS IN ITEM 86 WHEN CHANGES OCCUR TO ITEMS PRECEDED BY >

110 REMARKS:

A 001 RWY ARE ACTVT HIRL RY 13-31 - CTAF WHEN ATCT CLSD. PAPI RY 31 OPER 24 HRS.
A 110-1 WHEN ATCT CLSD - LAND RY 31, TAKEOFF RY 13, DUE TO OPPOSITE DIRECTION TRAFFIC USE LANDING LIGHT IN TRAFFIC PATTERN.
A 110-2 NOT RQMD FOR NIGHT USE OR IN MARGINAL WEATHER BY UNFAMILIAR PILOTS DUE TO MOUNTAINOUS TERRAIN.
A 110-4 BIRD ACTIVITY RY 13 END RY 31.
A 110-7 CTC ANGR 208-788-4992 OR 208-788-5102 FOR NOISE ABATEMENT PROCEDURES. APU OPERATION LIMITED TO 30 MINUTE MAXIMUM RUN TIME.
A 110-9 (ER) REFLECTORS ON TWYS.
A 110-11 DUE TO OPPOSITE TFC: ARCH RY 31 ALONG E SIDE OF VALLEY. DEP RY 13 ALONG W SIDE OF VALLEY. SHOWLINGH (ZSH)

111 INSPECTOR: 112 LAST INSP: 08/14/2013 113 LAST INFO REQ:

FAA Form 5010-1 (5-91) SUPERSEDES PREVIOUS EDITION

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION

AIRPORT MASTER RECORD

1 ASSOC CITY: ***CONTINUED*** 4 STATE: ID LOC ID: SUN FAA SITE #: 04000.A
2 AIRPORT NAME: 5 COUNTY:
3 ORD TO AIRPORT (NM): 6 REGION/ADO: ANM/SEA 7 SECT AERO CHT:

GENERAL

10 OWNERSHIP:
*11 OWNER:
*12 ADDRESS:
*13 PHONE NR:
*14 MANAGER:
*15 ADDRESS:
*16 PHONE NR:
*17 ATTENDANCE SCHEDULE:

SERVICES

*70 FUEL:
*71 AIRFRAME RPRS:
*72 PWR PLANT RPRS:
*73 BOTTLE OXYGEN:
*74 BULK OXYGEN:
*75 TSNT STORAGE:
*76 OTHER SERVICES:

BASED AIRCRAFT

90 SINGLE ENG:
91 MULTI ENG:
92 JET:
TOTAL:
93 HELICOPTERS:
94 GLIDERS:
95 MILITARY:
96 ULTRALIGHT:

FACILITIES

*20 ARPT BCN:
*80 ARPT LGT SKED:
*82 UNICOM:
*83 WIND INDICATOR:
84 SEGMENTED CIRCLE:
*85 CONTROL TWR:
*86 FSS:
87 FSS ON ARPT:
88 FSS PHONE NR:
89 TOLL FREE NR:

OPERATIONS

100 AIR CARRIER:
102 AIR TAXI:
104 GA LOCAL:
105 GA INRNT:
106 MILITARY:
TOTAL:

OPERATIONS FOR 12 MONTHS ENDING:

*22 ACREAGE:
*23 RIGHT TRAFFIC:
*24 NON-COMM LANDING:
25 NPIAS/FED AGREEMENTS:
*26 FAR 139 INDEX:

RUNWAY DATA

*30 RUNWAY IDENT:
*31 LENGTH:
*32 WIDTH:
*33 SURF TYPE-COND:
*34 SURF TREATMENT:
35 GROSS WT: SW
36 (IN THSDS) DW
37. DTW
38 ? DDTW
*39 PCN:

LIGHTING/APCH AIDS

*40 EDGE INTENSITY:
*42 RWY MARK TYPE-COND:
*43 VGSI:
44 THR CROSSING HGT:
45 VISUAL GLIDE ANGLE:
*46 CNTRLN-TDZ:
*47 RVR-RVV:
*48 REIL:
*49 APCH LIGHTS:

OBSTRUCTION DATA

50 FAR 77 CATEGORY:
*51 DISPLACED THR:
*52 CTLG OBSTN:
*53 OBSTN MARKED/LGTD:
*54 HGT ABOVE RWY END:
*55 DIST FROM RWY END:
*56 CNTRLN OFFSET:
*57 OBSTN CLNG SLOPE:
58 CLOSE-IN OBSTN:

DECLARED DISTANCES

*60 TAKE OFF RUN AVBL (TORA):
*61 TAKE OFF DIST AVBL (TODA):
*62 ACLT STOP DIST AVBL (ASDA):
*63 LNDG DIST AVBL (LDA):

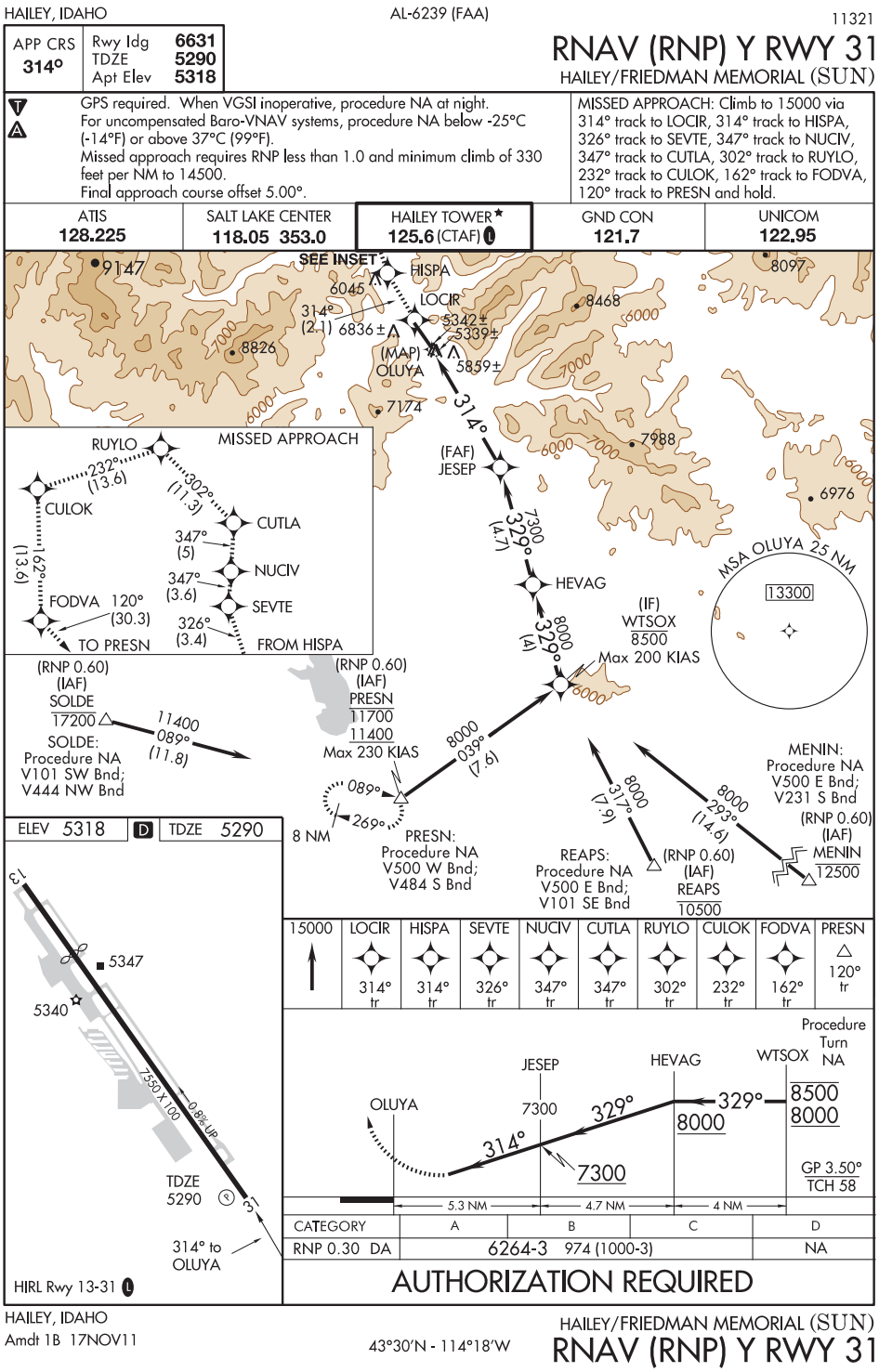
(*) ARPT MGR PLEASE ADVISE FSS IN ITEM 99 WHEN CHANGES OCCUR TO ITEMS PRECEDED BY *

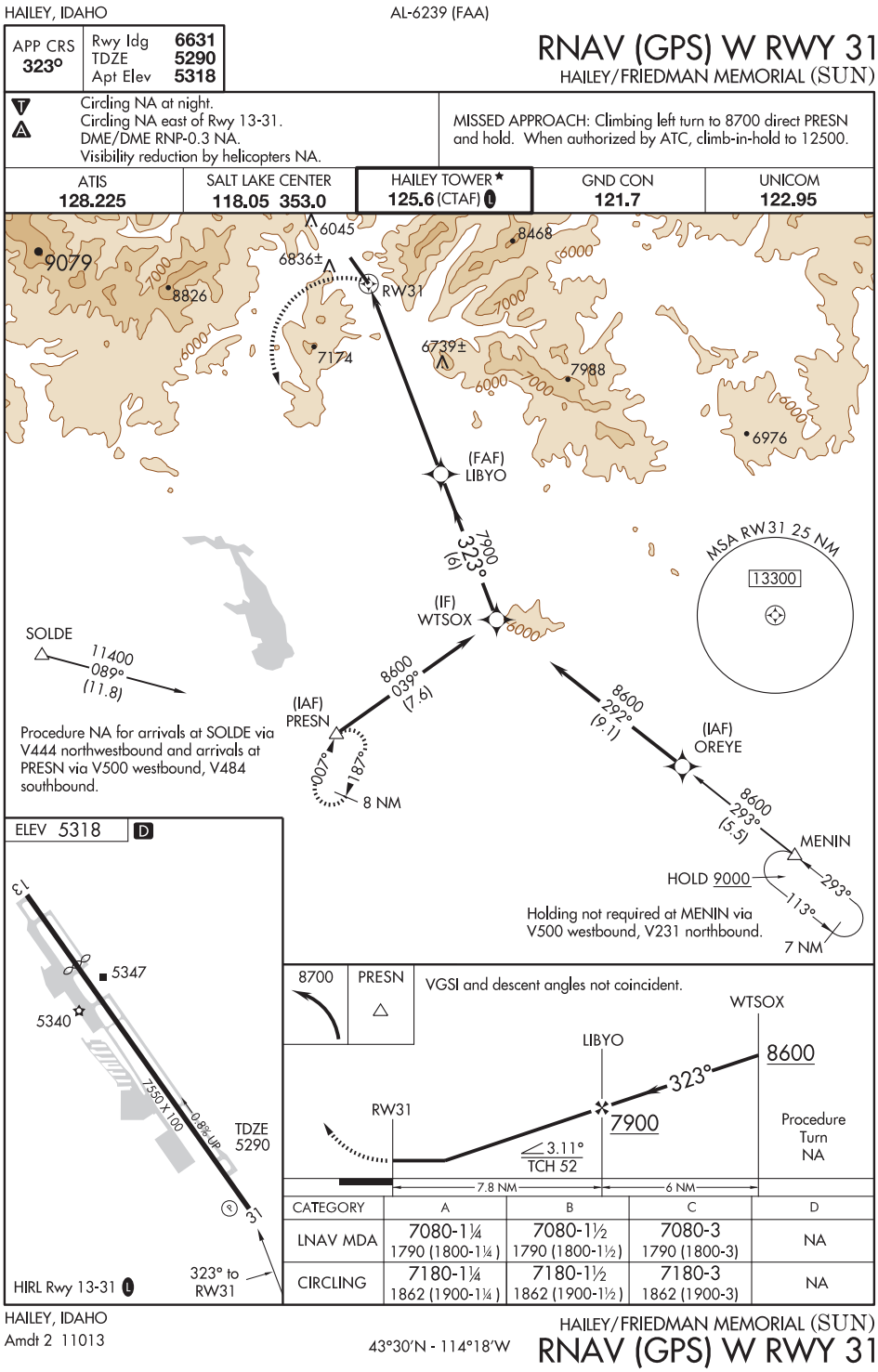
REMARKS

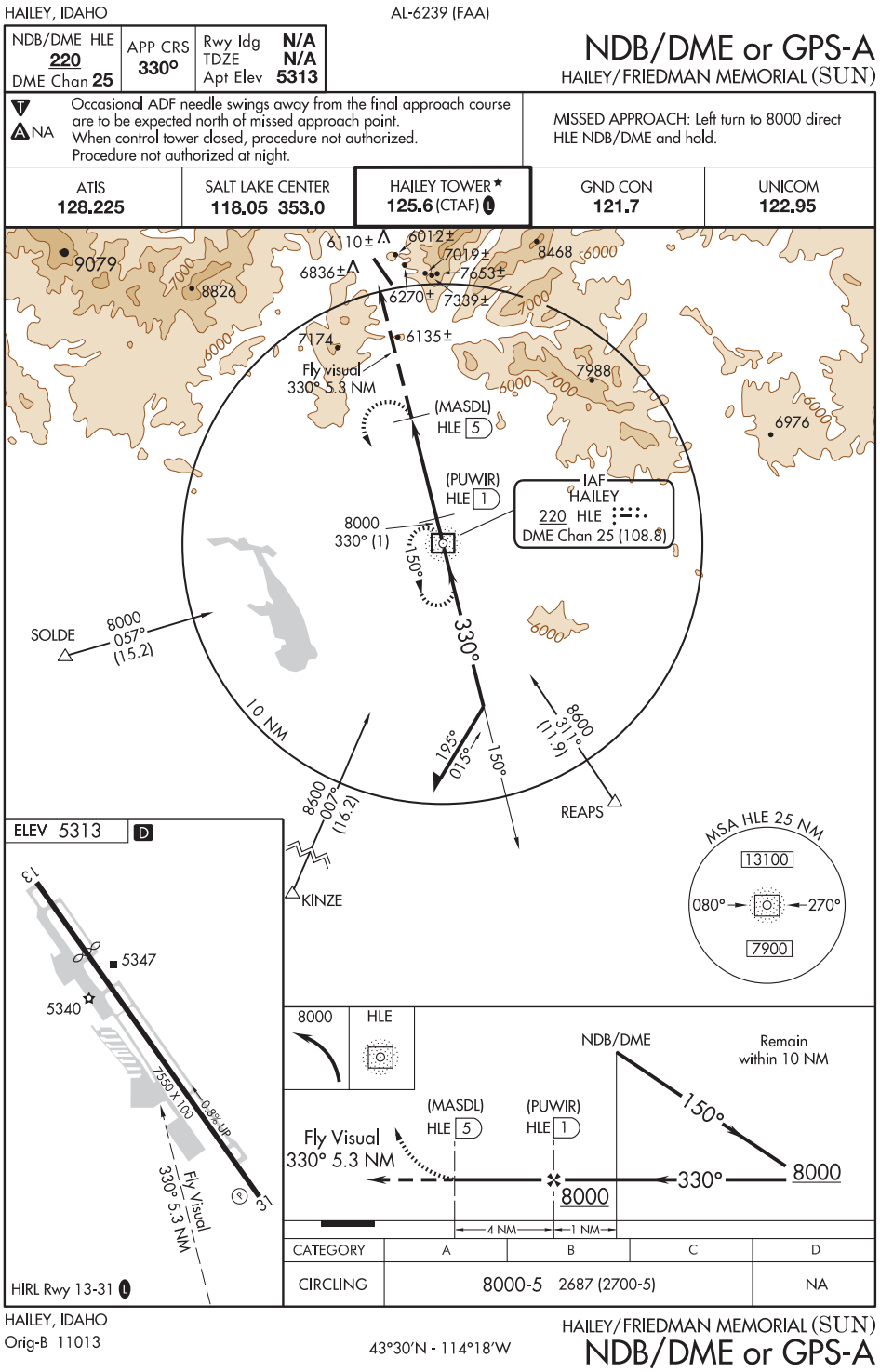
*110 REMARKS:
A 110-12 NO LOCKED BRAKE TURNS.
A 110-13 APU OPERATION LIMITED TO 30 MINS WITHOUT EXCEPTION.
A 110-14 TAXIWAYS A-E AND B-A RESTRICTED TO AIRCRAFT WITH WINGSPANS OF 49' OR LESS (AIRCRAFT DESIGN GROUP I) ONLY.
A 110-17 TWY A OPEN BTN ACFT AT DLGT HRS ONLY.
A 110-18 ACFT SPC CONDITIONS NOT MONITORED BETWEEN THE HOURS OF 2300 AND 0400.
A 110-19 LTD PARKG AVBL FOR AIR CARRIER ACFT.

111 INSPECTOR: 112 LAST INSP: 08/13/2021 113 LAST INFO REQ:

APPENDIX B
CURRENT INSTRUMENT APPROACH PROCEDURES


HAILEY, IDAHO
AL-6239 (FAA)
11321
APP CRS 314°
Rwy Idg 6631
TDZE 5290
Apt Elev 5318
RNAV (RNP) Y RWY 31
HAILEY/FRIEDMAN MEMORIAL (SUN)
GPS required. When VGSI inoperative, procedure NA at night.
For uncompensated Baro-VNAV systems, procedure NA below -25°C (-14°F) or above 37°C (99°F).
Missed approach requires RNP less than 1.0 and minimum climb of 330 feet per NM to 14500.
Final approach course offset 5.00°.
MISSED APPROACH: Climb to 15000 via 314° track to LOCIR, 314° track to HISPA, 326° track to SEVTE, 347° track to NUCIV, 347° track to CUTLA, 302° track to RUYLO, 232° track to CULOK, 162° track to FODVA, 120° track to PRESN and hold.
ATIS 128.225
SALT LAKE CENTER 118.05 353.0
HAILEY TOWER 125.6 (CTAF)
GND CON 121.7
UNICOM 122.95
SEE INSET
HISPA
LOCIR
OLUYA
(MAP)
(FAF)
JESEP
HEVAG
(IF)
WTSOX
8500
Max 200 KIAS
MSA OLUYA 25 NM
13300
MISSED APPROACH
RUYLO
CULOK
CUTLA
NUCIV
SEVTE
FODVA 120°
TO PRESN
FROM HISPA
(RNP 0.60)
(IAF)
SOLDE
17200
SOLDE: Procedure NA
V101 SW Bnd;
V444 NW Bnd
(RNP 0.60)
(IAF)
PRESN
11700
11400
Max 230 KIAS
PRESN: Procedure NA
V500 W Bnd;
V484 S Bnd
8 NM
REAPS: Procedure NA
V500 E Bnd;
V101 SE Bnd
(RNP 0.60)
(IAF)
REAPS
10500
MENIN: Procedure NA
V500 E Bnd;
V231 S Bnd
(RNP 0.60)
(IAF)
MENIN
12500
ELEV 5318
D
TDZE 5290
5347
5340
7350 X 100
0.8% UP
TDZE 5290
314° to OLUYA
HIRL Rwy 13-31
15000
LOCIR 314° tr
HISPA 314° tr
SEVTE 326° tr
NUCIV 347° tr
CUTLA 347° tr
RUYLO 302° tr
CULOK 232° tr
FODVA 162° tr
PRESN 120° tr
Procedure Turn NA
JESEP
HEVAG
WTSOX
OLUYA
7300
329°
314°
8000
8500
GP 3.50°
TCH 58
5.3 NM
4.7 NM
4 NM
CATEGORY A B C D
RNP 0.30 DA 6264-3 974 (1000-3) NA
AUTHORIZATION REQUIRED
HAILEY, IDAHO
Amdt 1B 17NOV11
43°30'N - 114°18'W
HAILEY/FRIEDMAN MEMORIAL (SUN)
RNAV (RNP) Y RWY 31
NW-1, 18 OCT 2012 to 15 NOV 2012
NW-1, 18 OCT 2012 to 15 NOV 2012


HAILEY, IDAHO
AL-6239 (FAA)
RNAV (GPS) W RWY 31
HAILEY/FRIEDMAN MEMORIAL (SUN)
APP CRS 323°
Rwy Idg 6631
TDZE 5290
Apt Elev 5318
Circling NA at night.
Circling NA east of Rwy 13-31.
DME/DME RNP-0.3 NA.
Visibility reduction by helicopters NA.
MISSED APPROACH: Climbing left turn to 8700 direct PRESN and hold. When authorized by ATC, climb-in-hold to 12500.
ATIS 128.225
SALT LAKE CENTER 118.05 353.0
HAILEY TOWER* 125.6 (CTAF) L
GND CON 121.7
UNICOM 122.95
6045
8468
9079
8826
6836±
RW31
7174
6739±
7988
6976
(FAF) LIBYO
7900
323°
(6)
MSA RW31 25 NM
13300
(IF) WTSOX
SOLDE
11400
089°
(11.8)
8600
039°
(7.6)
8600
292°
(9.1)
(IAF) PRESN
(IAF) OREYE
007°
187°
8 NM
8600
293°
(5.5)
MENIN
HOLD 9000
293°
113°
7 NM
Procedure NA for arrivals at SOLDE via V444 northwestbound and arrivals at PRESN via V500 westbound, V484 southbound.
Holding not required at MENIN via V500 westbound, V231 northbound.
ELEV 5318 D
5347
5340
7950 X 100
0.8% UP
TDZE 5290
323° to RW31
HIRL Rwy 13-31 L
8700
PRESN
VGSI and descent angles not coincident.
WTSOX
LIBYO
8600
323°
RW31
7900
3.11°
TCH 52
Procedure Turn NA
7.8 NM
6 NM
CATEGORY | A | B | C | D
LNAV MDA | 7080-1¼ 1790 (1800-1¼) | 7080-1½ 1790 (1800-1½) | 7080-3 1790 (1800-3) | NA
CIRCLING | 7180-1¼ 1862 (1900-1¼) | 7180-1½ 1862 (1900-1½) | 7180-3 1862 (1900-3) | NA
HAILEY, IDAHO
Amdt 2 11013
43°30'N - 114°18'W
HAILEY/FRIEDMAN MEMORIAL (SUN)
RNAV (GPS) W RWY 31
NW-1, 18 OCT 2012 to 15 NOV 2012
NW-1, 18 OCT 2012 to 15 NOV 2012



NW-1, 18 OCT 2012 to 15 NOV 2012

NW-1, 18 OCT 2012 to 15 NOV 2012

(AUREL2.AUREL) 07298 SL-6239 (FAA)

AURELIA TWO DEPARTURE (RNAV)

HAILEY/ FRIEDMAN MEMORIAL (SUN)
HAILEY, IDAHO

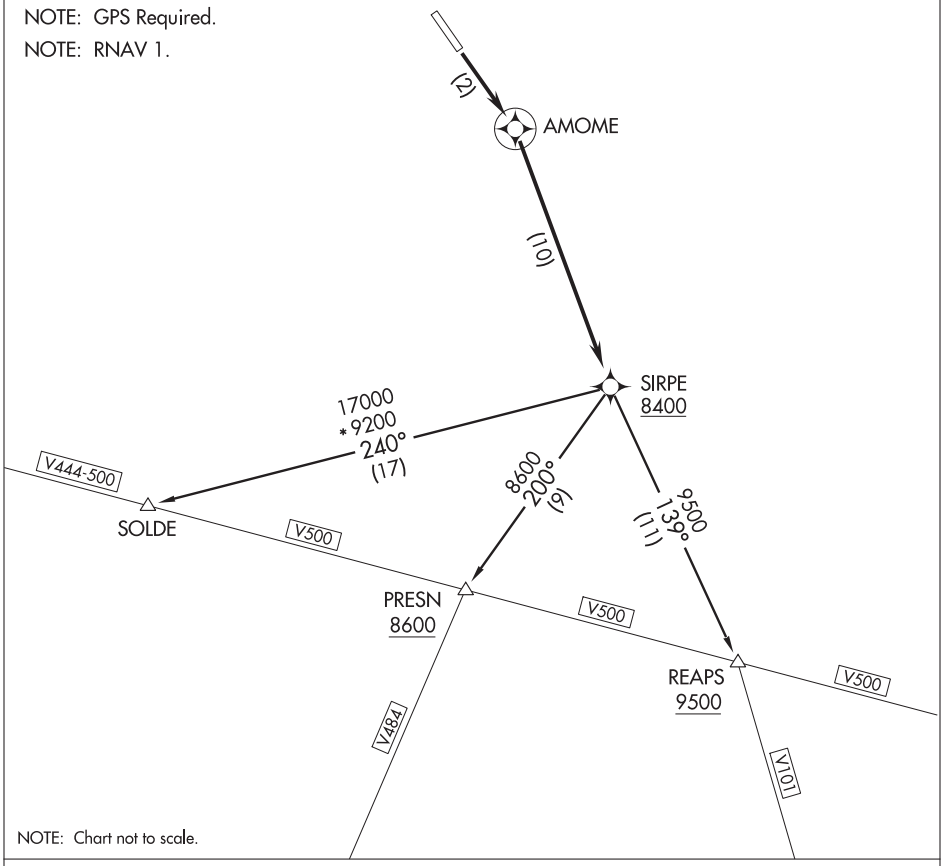
NW-1, 18 OCT 2012 to 15 NOV 2012

GND CON 121.7
HAILEY TOWER★ 125.6
SALT LAKE CENTER 118.05 353.0
UNICOM 122.95

TAKE-OFF OBSTACLE NOTES
Rwy 13: Multiple trees beginning 763′ from DER, 3′ right of centerline, up to 100′ AGL/5345′ MSL.

TAKE-OFF MINIMUMS
Rwy 13: Standard with minimum climb of 400′ per NM to 6700. ATC climb of 400′ per NM to 7300.
Rwy 31: NA, Obstacles.

NOTE: GPS Required.
NOTE: RNAV 1.



NOTE: Chart not to scale.

DEPARTURE ROUTE DESCRIPTION

TAKE-OFF RUNWAY 13: Climb direct AMOME, then climbing right turn direct SIRPE to cross SIRPE; cross SIRPE at or above 8400, Thence....via (Transition).

PRESN TRANSITION (AUREL2.PRESN)
REAPS TRANSITION (AUREL2.REAPS)
SOLDE TRANSITION (AUREL2.SOLDE)

NW-1, 18 OCT 2012 to 15 NOV 2012

AURELIA TWO DEPARTURE (RNAV)
(AUREL2.AUREL) 07298
HAILEY, IDAHO
HAILEY/ FRIEDMAN MEMORIAL (SUN)

APPENDIX C
DETAILED COST ESTIMATES

Item	Unit Cost	Unit	Alternative 1 (Runway East/Hwy East) Quantity	Alternative 1 (Runway East/Hwy East) Item Cost	Alternative 2 (Runway East/Hwy West) Quantity	Alternative 2 (Runway East/Hwy West) Item Cost	Alternative 3 (West) Quantity	Alternative 3 (West) Item Cost	Alternative 4 (South and Twist) Quantity	Alternative 4 (South and Twist) Item Cost
Site Work										
Topsoil Strip/Replace	$1.00	SY	825,000	$825,000.00	825,000	$825,000.00	805,000	$805,000.00	660,000	$660,000.00
Excavation to Embankment	$10.00	CY	300,000	$3,000,000.00	300,000	$3,000,000.00	400,000	$4,000,000.00	500,000	$5,000,000.00
Excavation To Be Disposed Offsite	$15.00	CY	0	$0.00	0	$0.00	0	$0.00	0	$0.00
Unsuitable Overdepth Excavation	$25.00	CY	30,000	$750,000.00	30,000	$750,000.00	40,000	$1,000,000.00	50,000	$1,250,000.00
Storm Drainage	Varies	LS	1	$1,000,000.00	1	$1,000,000.00	1	$1,000,000.00	1	$1,000,000.00
Fencing	$22.00	LF	14,000	$308,000.00	18,000	$396,000.00	11,000	$242,000.00	21,000	$462,000.00
Gates	$25,000.00	Each	5	$125,000.00	5	$125,000.00	5	$125,000.00	5	$125,000.00
Perimeter/Access Road	$10.00	LF	13,500	$135,000.00	18,000	$180,000.00	14,000	$140,000.00	21,000	$210,000.00
Wetland Mitigation										
Pipe Existing Canal	$120.00	LF	1,600	$192,000.00	1,600	$192,000.00	1,800	$216,000.00	4,300	$516,000.00
Re-establishment	$100,000.00	Acre	0.7	$70,000.00	0.7	$70,000.00	0.8	$80,000.00	2.0	$200,000.00
Subtotal, Site Work Direct Costs				$6,405,000.00		$6,538,000.00		$7,608,000.00		$9,423,000.00
Indirect Costs (Mobilization, Safety, Etc.)	10%			$640,500.00		$653,800.00		$760,800.00		$942,300.00
Subtotal, Site Work				**$7,045,500.00**		**$7,191,800.00**		**$8,368,800.00**		**$10,365,300.00**
Airfield										
Pavement Removal	$1.50	SY	180,000	$270,000.00	180,000	$270,000.00	367,000	$550,500.00	210,333	$315,500.00
Runway										
Pavement (100'x7,500')	$85.00	SY	84,000	$7,140,000.00	84,000	$7,140,000.00	84,000	$7,140,000.00	84,000	$7,140,000.00
Shoulders (20')	$10.00	SY	34,000	$340,000.00	34,000	$340,000.00	34,000	$340,000.00	34,000	$340,000.00
Edge Drains	$15.00	LF	15,000	$225,000.00	15,000	$225,000.00	15,000	$225,000.00	15,000	$225,000.00
Markings	$50,000.00	LS	1	$50,000.00	1	$50,000.00	1	$50,000.00	1	$50,000.00
Connecting Taxiways										
Pavement (50')	$80.00	SY	17,300	$1,384,000.00	17,300	$1,384,000.00	13,600	$1,088,000.00	24,000	$1,920,000.00
Shoulders (20')	$10.00	SY	7,200	$72,000.00	7,200	$72,000.00	5,800	$58,000.00	11,000	$110,000.00
Edge Drains	$15.00	LF	3,250	$48,750.00	3,250	$48,750.00	2,600	$39,000.00	5,000	$75,000.00
Markings	$3,000.00	Each	5	$15,000.00	5	$15,000.00	4	$12,000.00	7	$21,000.00
Parallel Taxiway										
Pavement (50')	$80.00	SY	66,000	$5,280,000.00	66,000	$5,280,000.00	42,000	$3,360,000.00	72,000	$5,760,000.00
Shoulders (20')	$10.00	SY	29,000	$290,000.00	29,000	$290,000.00	28,000	$280,000.00	50,000	$500,000.00
Edge Drains	$15.00	LF	13,000	$195,000.00	13,000	$195,000.00	11,250	$168,750.00	23,000	$345,000.00
Markings	$15,000.00	LS	1	$15,000.00	1	$15,000.00	1	$15,000.00	2	$30,000.00
Terminal Apron										
Pavement	$80.00	SY	12,100	$968,000.00	12,100	$968,000.00	24,800	$1,984,000.00	0	$0.00
Markings	$1,000.00	LS	1	$1,000.00	1	$1,000.00	1	$1,000.00	1	$1,000.00
Deconfliction Aprons										
Pavement	$80.00	SY	5,000	$400,000.00	5,000	$400,000.00	5,000	$400,000.00	12,000	$960,000.00
Markings	$500.00	LS	1	$500.00	1	$500.00	1	$500.00	2	$1,000.00
GA Aprons/Taxilanes										
Pavement	$75.00	SY	18,000	$1,350,000.00	18,000	$1,350,000.00	154,000	$11,550,000.00	34,000	$2,550,000.00
Markings	$2,000.00	LS	2	$4,000.00	2	$4,000.00	4	$8,000.00	1	$2,000.00
Electrical										
HIRLs	$30.00	LF	15,000	$450,000.00	15,000	$450,000.00	15,000	$450,000.00	15,000	$450,000.00
MITLs	$25.00	LF	16,000	$400,000.00	16,000	$400,000.00	14,000	$350,000.00	27,000	$675,000.00
Vault	$150,000.00	LS	1	$150,000.00	1	$150,000.00	1	$150,000.00	0	$0.00
Signs	$6,000.00	Each	30	$180,000.00	30	$180,000.00	50	$300,000.00	50	$300,000.00
NAVAIDs										
Relocate PAPIs	$50,000.00	LS	1	$50,000.00	1	$50,000.00	1	$50,000.00	1	$50,000.00
Relocate AWOS	$50,000.00	LS	1	$50,000.00	1	$50,000.00	1	$50,000.00	1	$50,000.00
Terminal Modifications (Walkway)	$200,000.00	LS	1	$200,000.00	1	$200,000.00	0	$0.00	0	$0.00
Air Traffic Control Tower										
Demolish Existing	$50,000.00	LS	1	$50,000.00	1	$50,000.00	1	$50,000.00	1	$50,000.00
Construct New Tower	$5,100,000.00	LS	1	$5,100,000.00	1	$5,100,000.00	1	$5,100,000.00	1	$5,100,000.00
Subtotal, Airfield Direct Costs				$24,678,250.00		$24,678,250.00		$33,769,750.00		$27,020,500.00
Indirect Costs (Mobilization, Safety, Etc.)	10%			$2,467,825.00		$2,467,825.00		$3,376,975.00		$2,702,050.00
Subtotal, Airfield				**$27,146,075.00**		**$27,146,075.00**		**$37,146,725.00**		**$29,722,550.00**
Infrastructure										
Airport Access Road	$75.00	LF	1,200	$90,000.00	1,200	$90,000.00	5,000	$375,000.00	0	$0.00
Utilities (Dry and Wet)	Varies	LS	1	$100,000.00	1	$100,000.00	1	$250,000.00	1	$100,000.00
Subtotal, Infrastructure Direct Costs				$190,000.00		$100,000.00		$250,000.00		$100,000.00
Indirect Costs (Mobilization, Safety, Etc.)	10%			$19,000.00		$10,000.00		$25,000.00		$10,000.00
Subtotal, Infrastructure				**$209,000.00**		**$110,000.00**		**$275,000.00**		**$110,000.00**
Subtotal, Airfield Construction				**$34,400,575.00**		**$34,447,875.00**		**$45,790,525.00**		**$40,197,850.00**
Construction Contingency	10%			$3,440,057.50		$3,444,787.50		$4,579,052.50		$4,019,785.00
Planning	5%			$1,720,028.75		$1,722,393.75		$2,289,526.25		$2,009,892.50
Engineering	20%			$6,880,115.00		$6,889,575.00		$9,158,105.00		$8,039,570.00
Total, Construction				**$46,440,776.25**		**$46,504,631.25**		**$61,817,208.75**		**$54,267,097.50**

Item	Unit Cost	Unit	Alternative 1 (Runway East/Hwy East) Quantity	Alternative 1 (Runway East/Hwy East) Item Cost	Alternative 2 (Runway East/Hwy West) Quantity	Alternative 2 (Runway East/Hwy West) Item Cost	Alternative 3 (West) Quantity	Alternative 3 (West) Item Cost	Alternative 4 (South and Twist) Quantity	Alternative 4 (South and Twist) Item Cost
Highway Relocation										
Pavement Removal	$1.50	SY	72,000	$108,000.00	95,000	$142,500.00	0	$0.00	0	$0.00
New Pavement Construction	$55.00	SY	100,000	$5,500,000.00	145,000	$7,975,000.00	0	$0.00	0	$0.00
Curb/Gutter	$15.00	LF	26,000	$390,000.00	34,000	$510,000.00	0	$0.00	0	$0.00
New Pedestrian Path	$25.00	LF	12,000	$300,000.00	0	$0.00	0	$0.00	0	$0.00
Relocate Signal	$150,000.00	Each	3	$450,000.00	2	$300,000.00	0	$0.00	0	$0.00
Clearing and Grading	$10.00	SY	0	$0.00	137,000	$1,370,000.00	0	$0.00	0	$0.00
Sound Wall	$600.00	LF	11,500	$6,900,000.00	8,000	$4,800,000.00	0	$0.00	0	$0.00
Subtotal, Highway Direct Costs				$13,648,000.00		$15,097,500.00		$0.00		$0.00
Indirect Costs (Mobilization, Safety, Etc.)	10%			$1,364,800.00		$1,509,750.00		$0.00		$0.00
Subtotal, Highway Relocation				**$15,012,800.00**		**$16,607,250.00**		**$0.00**		**$0.00**
Construction Contingency	10%			$1,501,280.00		$1,660,725.00		$0.00		$0.00
Planning	5%			$750,640.00		$830,362.50		$0.00		$0.00
Engineering	20%			$3,002,560.00		$3,321,450.00		$0.00		$0.00
Environmental Impact Study Update	$ 400,000.00	LS	1	$400,000.00	1	$400,000.00	0	$0.00	0	$0.00
Total, Highway Relocation				**$20,667,280.00**		**$22,819,787.50**		**$0.00**		**$0.00**
Property Acquisition/Facility Relocation										
Residential Homes										
Purchase Home	$150,000.00	Each	105	$15,750,000.00	30	$4,500,000.00	4	$600,000.00	1	$150,000.00
Residential Property	$150,000.00	Acre	0	$0.00	0	$0.00	0	$0.00	18	$2,700,000.00
Relocation Expense	$25,000.00	Each	105	$2,625,000.00	30	$750,000.00	4	$100,000.00	1	$25,000.00
Demolish	$15,000.00	Each	105	$1,575,000.00	30	$450,000.00	4	$60,000.00	1	$15,000.00
Churches										
Purchase	$1,000,000.00	Each	1	$1,000,000.00	0	$0.00	0	$0.00	0	$0.00
Demolish	$40,000.00	Each	1	$40,000.00	0	$0.00	0	$0.00	0	$0.00
Light Industrial/Commercial										
Land Purchase	$450,000.00	Acre	0	$0.00	0	$0.00	6	$2,700,000.00	0	$0.00
Existing Facility Purchase	$100,000.00	Each	0	$0.00	0	$0.00	12	$1,200,000.00	0	$0.00
Demolish Existing Structures	$5.00	SF	0	$0.00	0	$0.00	54,781	$273,905.00	0	$0.00
Ranch										
Agricultural Land	$100,000.00	Acre	47	$4,700,000.00	216	$21,600,000.00	196	$19,600,000.00	523	$52,300,000.00
Light Industrial Land	$150,000.00	Acre	0	$0.00	0	$0.00	3	$450,000.00	0	$0.00
Building Demolition	$15,000.00	Each	4	$60,000.00	4	$60,000.00	13	$195,000.00	4	$60,000.00
Irrigation Modifications	$50,000.00	LS	1	$50,000.00	1	$50,000.00	0	$0.00	0	$0.00
Tree Removal	$50,000.00	LS	1	$50,000.00	1	$50,000.00	1	$50,000.00	3	$150,000.00
Acquire ROW from ITD for Runway OFA	$150,000.00	Acre	60	$9,000,000.00	60	$9,000,000.00	0	$0.00	0	$0.00
Hangars										
Lease Buyout	Varies	LS	0	$0.00	0	$0.00	0	$0.00	0	$0.00
Demolition	$5.00	SF	34,000	$170,000.00	34,000	$170,000.00	250,000	$1,250,000.00	0	$0.00
Replacement Construction	$100.00	SF	34,000	$3,400,000.00	34,000	$3,400,000.00	250,000	$25,000,000.00	0	$0.00
Terminal										
Demolition	$5.00	SF	0	$0.00	0	$0.00	28,000	$140,000.00	0	$0.00
Construction	$200.00	SF	0	$0.00	0	$0.00	28,000	$5,600,000.00	0	$0.00
Airport Administration Office										
Demolition	$5.00	SF	0	$0.00	0	$0.00	2,150	$10,750.00	0	$0.00
Construction	$125.00	SF	0	$0.00	0	$0.00	2,150	$268,750.00	0	$0.00
Airport Operations and ARFF										
Demolition	$5.00	SF	0	$0.00	0	$0.00	4,800	$24,000.00	0	$0.00
Construction	$200.00	SF	0	$0.00	0	$0.00	4,800	$960,000.00	0	$0.00
Airport Operations Storage										
Demolition	$5.00	SF	0	$0.00	0	$0.00	3,400	$17,000.00	0	$0.00
Construction	$100.00	SF	0	$0.00	0	$0.00	3,400	$340,000.00	0	$0.00
Airport Operations Covered Storage										
Demolition	$5.00	SF	0	$0.00	0	$0.00	2,100	$10,500.00	0	$0.00
Construction	$50.00	SF	0	$0.00	0	$0.00	2,100	$105,000.00	0	$0.00
FBO Office										
Demolition	$5.00	SF	0	$0.00	0	$0.00	9,500	$47,500.00	9,500	$47,500.00
Construction	$150.00	SF	0	$0.00	0	$0.00	9,500	$1,425,000.00	9,500	$1,425,000.00
FBO Hangar										
Demolition	$5.00	SF	0	$0.00	0	$0.00	31,000	$155,000.00	31,000	$155,000.00
Construction	$125.00	SF	0	$0.00	0	$0.00	31,000	$3,875,000.00	31,000	$3,875,000.00
Subtotal, Property Acquisition/Facility Relocation				**$38,420,000.00**		**$40,030,000.00**		**$64,457,405.00**		**$60,902,500.00**
Contingency	10%			$3,842,000.00		$4,003,000.00		$6,445,740.50		$6,090,250.00
Consulting (Legal, Survey, Real Estate, Admin.)	20%			$7,684,000.00		$8,006,000.00		$12,891,481.00		$12,180,500.00
Environmental Studies				$2,000,000.00		$2,000,000.00		$2,000,000.00		$2,000,000.00
Total, Property Acquisition/Facility Relocation				**$51,946,000.00**		**$54,039,000.00**		**$85,794,626.50**		**$81,173,250.00**
TOTAL COSTS				**$119,054,056.25**		**$123,363,418.75**		**$147,611,835.25**		**$135,440,347.50**

Item	Unit Cost	Unit	Alternative 5 (1700' South) Quantity	Alternative 5 (1700' South) Item Cost	Alternative 6 (No Expansion) Quantity	Alternative 6 (No Expansion) Item Cost	Alternative 7 (Modest Expansion) Quantity	Alternative 7 (Modest Expansion) Item Cost
Site Work								
Topsoil Strip/Replace	$1.00	SY	610,000	$610,000.00	580,000	$580,000.00	580,000	$580,000.00
Excavation to Embankment	$10.00	CY	250,000	$2,500,000.00	55,000	$550,000.00	300,000	$3,000,000.00
Excavation To Be Disposed Offsite	$15.00	CY	0	$0.00	245,000	$3,675,000.00	0	$0.00
Unsuitable Overdepth Excavation	$25.00	CY	25,000	$625,000.00	30,000	$750,000.00	30,000	$750,000.00
Storm Drainage	Varies	LS	1	$500,000.00	1	$250,000.00	1	$500,000.00
Fencing	$22.00	LF	12,900	$283,800.00	11,000	$242,000.00	14,000	$308,000.00
Gates	$25,000.00	Each	5	$125,000.00	5	$125,000.00	5	$125,000.00
Perimeter/Access Road	$10.00	LF	13,000	$130,000.00	10,000	$100,000.00	10,000	$100,000.00
Wetland Mitigation								
Pipe Existing Canal	$120.00	LF	1,600	$192,000.00	0	$0.00	0	$0.00
Re-establishment	$100,000.00	Acre	0.7	$70,000.00	0.0	$0.00	0.0	$0.00
Subtotal, Site Work Direct Costs				$5,035,800.00		$6,272,000.00		$5,363,000.00
Indirect Costs (Mobilization, Safety, Etc.)	10%			$503,580.00		$627,200.00		$536,300.00
Subtotal, Site Work				**$5,539,380.00**		**$6,899,200.00**		**$5,899,300.00**
Airfield								
Pavement Removal	$1.50	SY	110,000	$165,000.00	75,550	$113,325.00	85,000	$127,500.00
Runway								
Pavement (100'x7,500')	$85.00	SY	19,000	$1,615,000.00	0	$0.00	0	$0.00
Shoulders (20')	$10.00	SY	32,000	$320,000.00	0	$0.00	0	$0.00
Edge Drains	$15.00	LF	14,350	$215,250.00	0	$0.00	0	$0.00
Markings	$50,000.00	LS	1	$50,000.00	0	$0.00	0	$0.00
Connecting Taxiways								
Pavement (50')	$80.00	SY	6,000	$480,000.00	12,200	$976,000.00	12,200	$976,000.00
Shoulders (20')	$10.00	SY	6,000	$60,000.00	9,500	$95,000.00	9,500	$95,000.00
Edge Drains	$15.00	LF	2,550	$38,250.00	4,200	$63,000.00	4,200	$63,000.00
Markings	$3,000.00	Each	4	$12,000.00	5	$15,000.00	5	$15,000.00
Parallel Taxiway								
Pavement (50')	$80.00	SY	43,000	$3,440,000.00	42,200	$3,376,000.00	42,200	$3,376,000.00
Shoulders (20')	$10.00	SY	29,200	$292,000.00	25,500	$255,000.00	25,500	$255,000.00
Edge Drains	$15.00	LF	13,100	$196,500.00	11,400	$171,000.00	11,400	$171,000.00
Markings	$15,000.00	LS	1	$15,000.00	1	$15,000.00	1	$15,000.00
Terminal Apron								
Pavement	$80.00	SY	12,100	$968,000.00	12,500	$1,000,000.00	14,000	$1,120,000.00
Markings	$1,000.00	LS	1	$1,000.00	1	$1,000.00	1	$1,000.00
Deconfliction Aprons								
Pavement	$80.00	SY	9,550	$764,000.00	11,000	$880,000.00	14,000	$1,120,000.00
Markings	$500.00	LS	1	$500.00	1	$500.00	1	$500.00
GA Aprons/Taxilanes								
Pavement	$75.00	SY	11,318	$848,875.00	10,000	$750,000.00	10,000	$750,000.00
Markings	$2,000.00	LS	1	$2,000.00	1	$2,000.00	1	$2,000.00
Electrical								
HIRLs	$30.00	LF	14,350	$430,500.00	0	$0.00	0	$0.00
MITLs	$25.00	LF	15,650	$391,250.00	15,600	$390,000.00	15,600	$390,000.00
Vault	$150,000.00	LS	1	$150,000.00	1	$150,000.00	1	$150,000.00
Signs	$6,000.00	Each	16	$96,000.00	24	$144,000.00	24	$144,000.00
NAVAIDs								
Relocate PAPIs	$50,000.00	LS	1	$50,000.00	0	$0.00	0	$0.00
Relocate AWOS	$50,000.00	LS	1	$50,000.00	1	$50,000.00	1	$50,000.00
Terminal Modifications (Walkway)	$200,000.00	LS	1	$200,000.00	1	$200,000.00	1	$200,000.00
Air Traffic Control Tower								
Demolish Existing	$50,000.00	LS	1	$50,000.00	1	$50,000.00	1	$50,000.00
Construct New Tower	$5,100,000.00	LS	1	$5,100,000.00	1	$5,100,000.00	1	$5,100,000.00
Subtotal, Airfield Direct Costs				$16,001,125.00		$13,796,825.00		$14,171,000.00
Indirect Costs (Mobilization, Safety, Etc.)	10%			$1,600,112.50		$1,379,682.50		$1,417,100.00
Subtotal, Airfield				**$17,601,237.50**		**$15,176,507.50**		**$15,588,100.00**
Infrastructure								
Airport Access Road	$75.00	LF	1,200	$90,000.00	0	$0.00	1,200	$90,000.00
Utilities (Dry and Wet)	Varies	LS	1	$100,000.00	1	$50,000.00	1	$100,000.00
Subtotal, Infrastructure Direct Costs				$100,000.00		$50,000.00		$100,000.00
Indirect Costs (Mobilization, Safety, Etc.)	10%			$10,000.00		$5,000.00		$10,000.00
Subtotal, Infrastructure				**$110,000.00**		**$55,000.00**		**$110,000.00**
Subtotal, Airfield Construction				**$23,250,617.50**		**$22,130,707.50**		**$21,597,400.00**
Construction Contingency	10%			$2,325,061.75		$2,213,070.75		$2,159,740.00
Planning	5%			$1,162,530.88		$1,106,535.38		$1,079,870.00
Engineering	20%			$4,650,123.50		$4,426,141.50		$4,319,480.00
Total, Construction				**$31,388,333.63**		**$29,876,455.13**		**$29,156,490.00**

Item	Unit Cost	Unit	Alternative 5 (1700' South) Quantity	Alternative 5 (1700' South) Item Cost	Alternative 6 (No Expansion) Quantity	Alternative 6 (No Expansion) Item Cost	Alternative 7 (Modest Expansion) Quantity	Alternative 7 (Modest Expansion) Item Cost
Highway Relocation								
Pavement Removal	$1.50	SY	45,000	$67,500.00	0	$0.00	38,000	$57,000.00
New Pavement Construction	$55.00	SY	52,000	$2,860,000.00	0	$0.00	71,000	$3,905,000.00
Curb/Gutter	$15.00	LF	21,500	$322,500.00	0	$0.00	17,000	$255,000.00
New Pedestrian Path	$25.00	LF	400	$10,000.00	0	$0.00	400	$10,000.00
Relocate Signal	$150,000.00	Each	1	$150,000.00	0	$0.00	2	$300,000.00
Clearing and Grading	$10.00	SY	0	$0.00	0	$0.00	0	$0.00
Sound Wall	$600.00	LF	11,000	$6,600,000.00	0	$0.00	8,750	$5,250,000.00
Subtotal, Highway Direct Costs				$10,010,000.00		$0.00		$9,777,000.00
Indirect Costs (Mobilization, Safety, Etc.)	10%			$1,001,000.00		$0.00		$977,700.00
Subtotal, Highway Relocation				**$11,011,000.00**		**$0.00**		**$10,754,700.00**
Construction Contingency	10%			$1,101,100.00		$0.00		$1,075,470.00
Planning	5%			$550,550.00		$0.00		$537,735.00
Engineering	20%			$2,202,200.00		$0.00		$2,150,940.00
Environmental Impact Study Update	$ 400,000.00	LS	1	$400,000.00	0	$0.00	1	$400,000.00
Total, Highway Relocation				**$15,264,850.00**		**$0.00**		**$14,918,845.00**
Property Acquisition/Facility Relocation								
Residential Homes								
Purchase Home	$150,000.00	Each	0	$0.00	0	$0.00	0	$0.00
Residential Property	$150,000.00	Acre	0	$0.00	0	$0.00	0	$0.00
Relocation Expense	$25,000.00	Each	0	$0.00	0	$0.00	0	$0.00
Demolish	$15,000.00	Each	0	$0.00	0	$0.00	0	$0.00
Churches								
Purchase	$1,000,000.00	Each	0	$0.00	0	$0.00	0	$0.00
Demolish	$40,000.00	Each	0	$0.00	0	$0.00	0	$0.00
Light Industrial/Commercial								
Land Purchase	$450,000.00	Acre	0	$0.00	0	$0.00	0	$0.00
Existing Facility Purchase	$100,000.00	Each	0	$0.00	0	$0.00	0	$0.00
Demolish Existing Structures	$5.00	SF	0	$0.00	0	$0.00	0	$0.00
Ranch								
Agricultural Land	$100,000.00	Acre	110	$11,000,000.00	0	$0.00	33	$3,300,000.00
Light Industrial Land	$150,000.00	Acre	3	$450,000.00	0	$0.00	3	$450,000.00
Building Demolition	$15,000.00	Each	5	$75,000.00	0	$0.00	0	$0.00
Irrigation Modifications	$50,000.00	LS	0	$0.00	0	$0.00	0	$0.00
Tree Removal	$50,000.00	LS	1	$50,000.00	0	$0.00	0	$0.00
Acquire ROW from ITD for Runway OFA	$150,000.00	Acre	15	$2,250,000.00	0	$0.00	15	$2,250,000.00
Hangars								
Lease Buyout	Varies	LS	0	$0.00	1	$50,000.00	0	$0.00
Demolition	$5.00	SF	36,000	$180,000.00	52,000	$260,000.00	52,000	$260,000.00
Replacement Construction	$100.00	SF	36,000	$3,600,000.00	52,000	$5,200,000.00	52,000	$5,200,000.00
Terminal								
Demolition	$5.00	SF	0	$0.00	0	$0.00	0	$0.00
Construction	$200.00	SF	0	$0.00	0	$0.00	0	$0.00
Airport Administration Office								
Demolition	$5.00	SF	0	$0.00	2,150	$10,750.00	0	$0.00
Construction	$125.00	SF	0	$0.00	2,150	$268,750.00	0	$0.00
Airport Operations and ARFF								
Demolition	$5.00	SF	0	$0.00	0	$0.00	0	$0.00
Construction	$200.00	SF	0	$0.00	0	$0.00	0	$0.00
Airport Operations Storage								
Demolition	$5.00	SF	0	$0.00	0	$0.00	0	$0.00
Construction	$100.00	SF	0	$0.00	0	$0.00	0	$0.00
Airport Operations Covered Storage								
Demolition	$5.00	SF	0	$0.00	0	$0.00	0	$0.00
Construction	$50.00	SF	0	$0.00	0	$0.00	0	$0.00
FBO Office								
Demolition	$5.00	SF	0	$0.00	0	$0.00	0	$0.00
Construction	$150.00	SF	0	$0.00	0	$0.00	0	$0.00
FBO Hangar								
Demolition	$5.00	SF	0	$0.00	0	$0.00	0	$0.00
Construction	$125.00	SF	0	$0.00	0	$0.00	0	$0.00
Subtotal, Property Acquisition/Facility Relocation				**$17,605,000.00**		**$5,789,500.00**		**$11,460,000.00**
Contingency	10%			$1,760,500.00		$578,950.00		$1,146,000.00
Consulting (Legal, Survey, Real Estate, Admin.)	20%			$3,521,000.00		$1,157,900.00		$2,292,000.00
Environmental Studies				$2,000,000.00		$250,000.00		$500,000.00
Total, Property Acquisition/Facility Relocation				**$24,886,500.00**		**$7,776,350.00**		**$15,398,000.00**
TOTAL COSTS				**$71,539,683.63**		**$37,652,805.13**		**$59,473,335.00**

APPENDIX D

PROPOSED MODIFICATION OF AIRPORT DESIGN STANDARDS

APPENDIX D – PROPOSED MODIFICIATION OF AIRPORT DESIGN STANDARDS

As discussed in Chapter 3, the current approved Airport Layout Plan for SUN lists several non-standard conditions relative to airport design standards. Alternatives 5-7 included in Chapter 5 propose several Modification of Airport Design Standards (MOS) to improve existing non-standard conditions while maintaining an acceptable level of safety at the airport. Use of MOS is *not* allowed for RSA dimensional standards and SUN will be required to comply with the Congressional RSA mandate by the end of 2015.

In 2011, the Transportation Research Board (TRB) published Airport Cooperative Research Program (ACRP) Report 51 – *Risk Assessment Method to Support Modification of Airfield Separation Standards*. This ACRP report provides a process to justify MOS for airports where standards cannot be met using practical means. This document is recognized by the FAA and was used in the development of the proposed MOS included in this analysis.

A Technical Memo was prepared that summarizes the analysis used in development of these MOS. A copy of that Memo is included in this Appendix.

Proposed draft MOS are also included in this Appendix. The draft MOS have been developed in the current FAA format. Further coordination with the FAA Airports District and Regional Offices regarding the approval of the proposed draft MOS will be necessary.

- Runway OFA
- Runway-Taxiway Separation
- Taxiway OFA
- Runway OFA Grading
- RSA Grading
- Runway Centerline to Aircraft Parking

APPENDIX D - MOS TECHNICAL MEMO

Technical Memorandum

RE: SUN Modifications of Design Standards

Prepared by: Nathan Cuvala, T-O Engineers

The intent of this memorandum is to explain the methodology behind the requests for Modifications of Airport Design Standards (MOS) at the Friedman Memorial Airport. The requested MOS forms will be submitted separately.

1. BACKGROUND

The Friedman Memorial Airport is located in Hailey, Idaho. This airport serves the Wood River Valley region of Idaho, including the Sun Valley resort area. The Airport is currently served by two commercial service air carriers: SkyWest and Horizon Air. A large number of corporate jets and other general aviation aircraft also use the airfield for business, recreation and travel to and from the large number of second homes in the area. The Friedman Memorial Airport Authority (FMAA) governs and manages the airport under a joint powers agreement between the City of Hailey and Blaine County, who jointly sponsor the airport.

Traffic by aircraft such as the Bombardier Q400, operated by Horizon Air, and several models of large GA aircraft (e.g., Gulfstream G-V and Bombardier Global Express) dictates the Airport Reference Code for the airport is C-III. Due to the geometry of the existing site, the airport does not meet current FAA design standards for many criteria including:

- Runway to Parallel Taxiway Separation
- Parallel Taxiway Object Free Area
- Runway Object Free Area Grading
- Runway Object Free Area (OFA) Width
- Runway Safety Area (RSA) Grading
- Runway to Aircraft Parking Separation

Until recently, the planned solution to meeting these standards was to relocate the airport to a new site to the south and away from the valley cities. The Federal Aviation Administration (FAA) was conducting an Environmental Impact Statement (EIS) study for a new location until the decision was made to suspend the study in August 2011, due to financial and environmental concerns with the sites under consideration.

A relocated airport is still the ultimate solution, as it will provide airport infrastructure that will meet standards, accommodate all foreseeable demand and provide a reliable all-weather airport. Locating a site and building a new airport is likely to take time, however, and some improvements are required in order for the Airport to survive and thrive at the existing site.

The FMAA has developed a plan to meet standards at the existing site wherever possible and provide an equivalent level of safety where standards can't be met. This technical memorandum will provide the background and justification for each of the requested MOS. These MOS are

seen as an interim solution while the sponsor continues the process of locating a site for the future airport.

2. METHODOLOGY

In 2011, the Transportation Research Board (TRB) released Airport Cooperative Research Program (ACRP) Report #51 – Risk Assessment Method to Support Modifications of Airfield Separation Standards. The ACRP is funded by the Federal Aviation Administration (FAA). This report was used to support several of the MOS requested at the Friedman Memorial Airport. Engineering Brief (EB) #78 – Linear Equations for Evaluating the Separation of Airplane Design Groups on Parallel Taxiways and Taxiways to Fixed/Movable Objects was also used.

The following four MOS listed below were modeled in accordance with Appendix A – Risk Assessment Methodology of ACRP Report #51:

- Runway to Parallel Taxiway Separation
- Runway to Aircraft Parking Separation
- Runway Object Free Area (OFA) Width
- Parallel Taxiway Object Free Area

This report uses a series of risk plots along with the annual number of operations to analyze the risk associated with either Runway to Parallel Taxiway, Runway to Object, or Taxiway to Object Separations. The operations numbers at SUN over the last decade were reviewed to determine the average annual number of operations. The average annual number of operations from 1990 to 2011 was approximately 50,000 operations. Since 2001, operations levels steadily declined until 2008 when they leveled off at approximately 30,000 annual operations. For the purpose of this risk analysis, the average annual operation level was used as it was deemed to be more conservative.

For operations involving the runway, the risk is analyzed based on three distinct phases of flight:

- Landing - Airborne Phase
- Landing - Ground Phase
- Takeoff

The separation distance from the runway centerline to either the parallel taxiway centerline or an object is used with the associated risk plot to calculate the risk of collision per operation. An example of one of the risk plots is shown below:

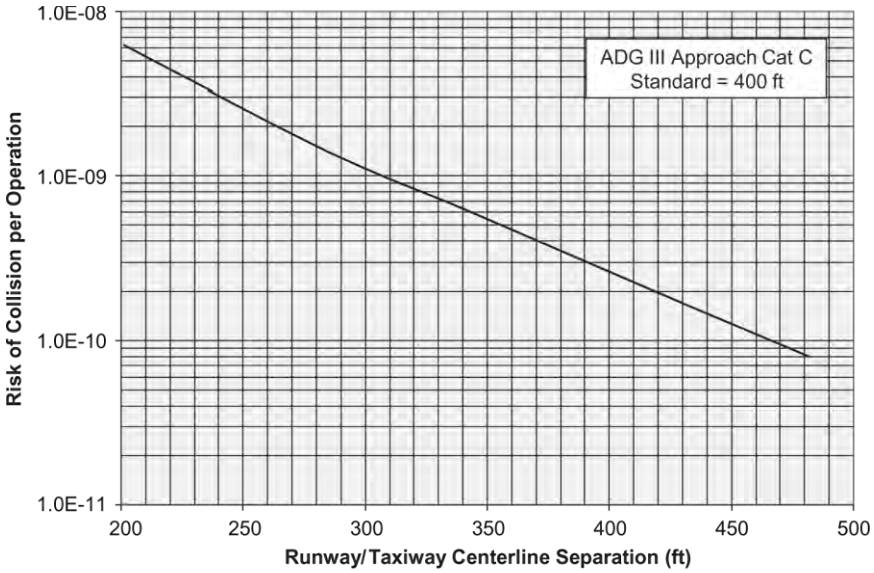


Figure AA-33. Missed approach collision risk for ADG III Cat I.

Source: ACRP Report #51

The risk of collisions per operation is then analyzed along with the number of annual airport operations for the appropriate phase of flight to determine the frequency of occurrence. The frequency of occurrence is used to determine the FAA likelihood level using Table A-3 from ACRP Report #51 which is shown below:

Table A-3. FAA likelihood levels (FAA, 2010).

	General	Airport Specific	ATC Operational	
			Per Facility	NAS-wide
Frequent A	Probability of occurrence per operation is equal to or greater than 1×10^{-3}	Expected to occur more than once per week or every 2,500 departures (4×10^{-4}), whichever occurs sooner	Expected to occur more than once per week	Expected to occur every 1–2 days
Probable B	Probability of occurrence per operation is less than 1×10^{-3}, but equal to or greater than 1×10^{-5}	Expected to occur about once every month or 250,000 departures (4×10^{-6}), whichever occurs sooner	Expected to occur about once every month	Expected to occur several times per month
Remote C	Probability of occurrence per operation is less than 1×10^{-5} but equal to or greater than 1×10^{-7}	Expected to occur about once every year or 2.5 million departures (4×10^{-7}), whichever occurs sooner	Expected to occur about once every 1–10 years	Expected to occur about once every few months
Extremely Remote D	Probability of occurrence per operation is less than 1×10^{-7} but equal to or greater than 1×10^{-9}	Expected to occur once every 10–100 years or 25 million departures (4×10^{-8}), whichever occurs sooner	Expected to occur about once every 10–100 years	Expected to occur about once every 3 years
Extremely Improbable E	Probability of occurrence per operation is less than 1×10^{-9}	Expected to occur less than once every 100 years	Expected to occur less than once every 100 years	Expected to occur less than once every 30 years

Note: Occurrence is defined per movement.

Source: ACRP Report #51

A Hazard Severity Classification is then assigned based on the worst credible outcome of an incident. The Hazard Severity Classifications were determined in accordance with Table A-4 FAA Severity Definitions from ACRP Report #51 and are shown below:

Table A-4. FAA severity definitions (FAA, 2010).

Hazard Severity Classification				
Minimal 5	**Minor 4**	**Major 3**	**Hazardous 2**	**Catastrophic 1**
No damage to aircraft but minimal injury or discomfort of little consequence to passenger(s) or workers	- Minimal damage to aircraft; - Minor injury to passengers; - Minimal unplanned airport operations limitations (i.e. taxiway closure); - Minor incident involving the use of airport emergency procedures	- Major damage to aircraft and/or minor injury to passenger(s)/ worker(s); - Major unplanned disruption to airport operations; - Serious incident; - Deduction on the airport's ability to deal with adverse conditions	- Severe damage to aircraft and/or serious injury to passenger(s)/ worker(s); - Complete unplanned airport closure; - Major unplanned operations limitations (i.e. runway closure); - Major airport damage to equipment and facilities	- Complete loss of aircraft and/or facilities or fatal injury in passenger(s)/ worker(s); - Complete unplanned airport closure and destruction of critical facilities; - Airport facilities and equipment destroyed

Source: ACRP Report #51

Using both the FAA likelihood level and the Hazard Severity Classification the risk was then analyzed using Figure A-1 FAA Risk Matrix from ACRP Report #51, shown below:

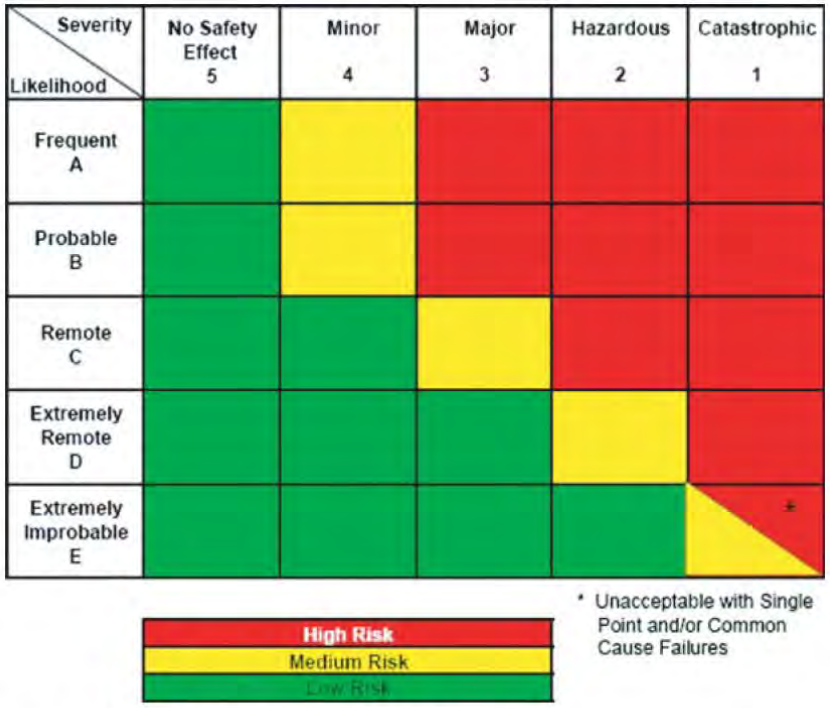


Figure A-1. FAA risk matrix (FAA, 2010).

Source: ACRP Report #51

The MOS for Parallel Taxiway Object Free Area was analyzed in accordance with Engineering Brief #78.

The MOS for both Runway Safety Area and Object Free Area grading were analyzed in accordance with the stated purpose of each of the FAA design standards in either Advisory Circular 150/5300-13A or 150/5300-13 Change 18.

3. ANALYSIS

Several of the MOS are tied directly together in that if one is not approved there is no need for the others. The first three related MOS are:

- 1A - Runway to Parallel Taxiway Separation
- 1B - Parallel Taxiway Object Free Area
- 1C - Runway Object Free Area (OFA) Grading

The remaining MOS are shown below:

- 2- Runway Object Free Area (OFA) Width
- 3- Runway Safety Area (RSA) Grading
- 4 - Runway to Aircraft Parking Separation

Several of the MOS listed above are related to MOS 1A, B or C. If MOS 3 – RSA Grading is approved, MOS 1C – Runway OFA Grading is not required. If MOS 1A, B or C are not

approved, MOS 4 – Runway to Aircraft Parking will not be applicable. In the introduction to the analysis for each MOS below, the relation to the other MOS is noted. The following table shows the relationship between each MOS.

MOS	Decision	MOS Not Applicable
1A	Not Approved	1B, 1C, 3, 4
1B	Not Approved	1A, 1C, 4
1C	Not Approved	1A, 1B, 4
3	Approved	1C
4	Not Approved	1A, 1B, 1C, 2, 3

As the relationship between each MOS is complex, it is recommended all proposed MOS be considered together. Following is the analysis of each individual MOS.

MOS 1A - Runway to Parallel Taxiway Separation

The FAA design standard for Runway to Parallel Taxiway Separation for ARC C-III is 400'. The requested MOS for Runway to Parallel Taxiway Separation of Taxiway B is 320'. This MOS is requested in conjunction with MOS 1B - Parallel Taxiway OFA and MOS 1C - Runway OFA Grading. If this MOS is not approved, MOS 4 – Runway to Aircraft Parking Separation is not required.

When analyzing the risk associated with a reduction in Runway to Parallel Taxiway Separation it is important to consider the purpose of the design standard. Appendix 8, Paragraph 1 b. of Advisory Circular 150/5300-13 Change 18 provides the design rationale for separations associated with runway to parallel taxiway:

> *"Runway to parallel taxiway/taxilane separation is determined by the landing and takeoff flight path profiles and physical characteristics of airplanes. The runway to parallel taxiway/taxilane standard precludes any part of an airplane (tail, wingtip, nose, etc.) on a parallel taxiway/taxilane centerline from being within the runway safety area or penetrating the OFZ."*

Paragraph 321 a. (1) of Advisory Circular 150/5300-13A provides the same rationale; however the reference to penetrations of the runway safety area or OFZ has been removed:

> *"These standards are determined by landing and takeoff flight path profiles and physical characteristics of aircraft."*

Additional background on the research that went into determining Runway to Parallel Taxiway Separation is further discussed on Page 5 of ACRP Report #51:

> *"In the 1960s, the FAA's Flight Standards organization and the ICAO Obstacle Clearance Panel (OCP) developed the Collision Risk Model (CRM) for ILS operations. The CRM was based on actual observation of 2,500 aircraft on an ILS precision approach to a runway. Four observations were made for each aircraft's approach. This model was used to define the area that needed to be protected on an airport when an aircraft was making an ILS approach. The runway/taxiway separation also took into account the possibility of an aircraft on landing rollout or takeoff roll veering off the runway."*

A separation to the C-III standard could be met in one of two ways, either shift Runway 13-31 and State Highway 75 to the east or shift all facilities on the airfield including the terminal, FBO facilities, ARFF, maintenance and all hangars to the west. The estimated costs of each alternative are shown below:

- Shift Runway 13-31 and State Highway 75 East - $144 Million dollars
- Shift Airfield Facilities West - $115 Million dollars

The maximum separation possible at SUN without major impacts to airfield facilities is 320' from Runway 13-31 centerline. There is a small area on the south end of the airfield where the separation could be increased to 330'; however as 320' is the controlling separation, a separation of 330' was not analyzed. The risks associated with each of the phases of flight described previously are analyzed for a Runway to Taxiway Separation of 320' below:

Airborne Landing Phase - Using the separation of 320' and Figure AA-33 in Appendix A of ACRP Report #51, the following provides a risk level 8.4E-10 or one chance in 1.2 billion landings. This can be seen in the figure below:

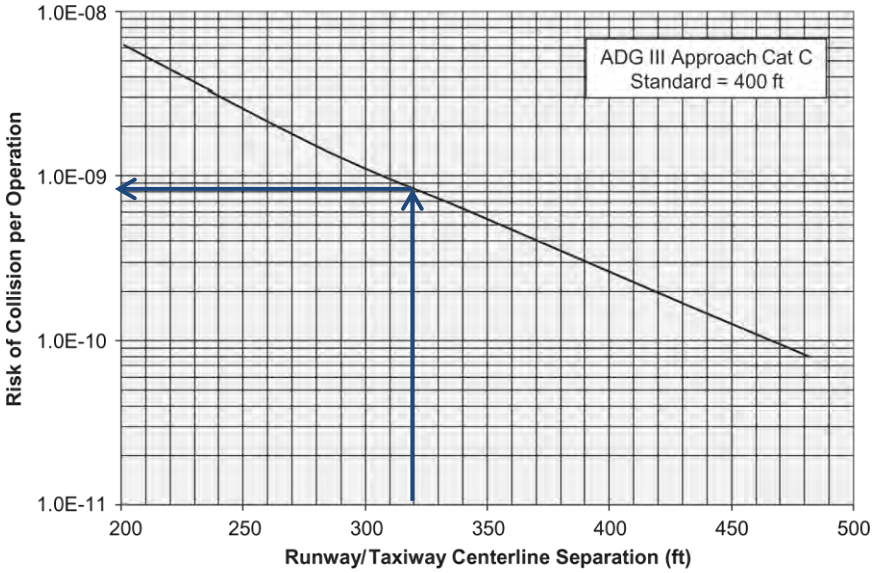


Figure AA-33. Missed approach collision risk for ADG III Cat I.

Source: ACRP Report #51

The current annual number of landing operations at SUN is approximately 25,000 or half of the 50,000 annual operations. As the risk is one incident in every 1.2 billion landings, the occurrence is calculated as 1.2 billion divided by 25,000 operations per year which equates to one incident every 47,620 years.

Landing Roll Phase - Using the separation of 320' and Figure AA-43 in Appendix A of ACRP Report #51, provides a risk level 9.0E-08 or one chance in 11 million landings. This can be seen in the figure below:

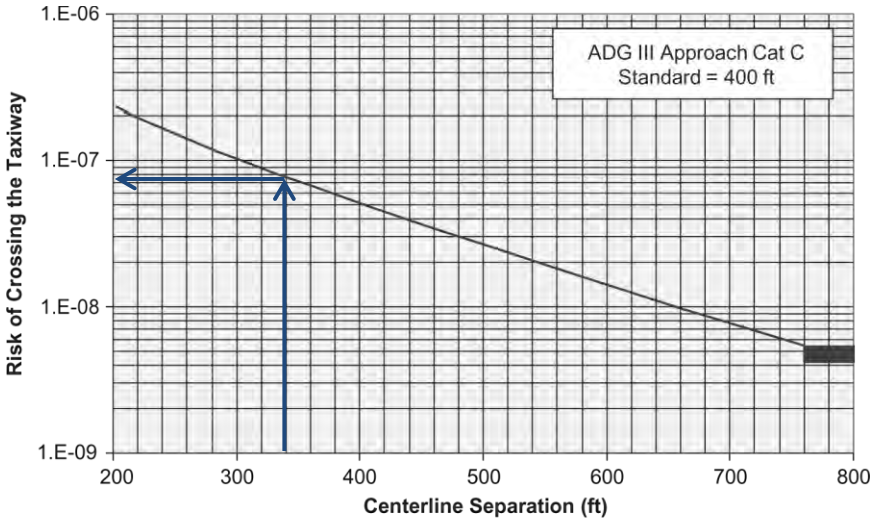


Figure AA-43. Landing veer-off collision risk for ADG III.

Source: ACRP Report #51

As the risk is one incident in every 11 million landings, the occurrence is calculated as 11 million divided by 25,000 operations per year which equates to one incident every 440 years.

Takeoff Roll Phase - Using the separation of 320' and Figure AA-50 in Appendix A of ACRP Report #51, provides a risk level 2.5E-08 or one chance in 40 million takeoffs. This can be seen in the figure below:

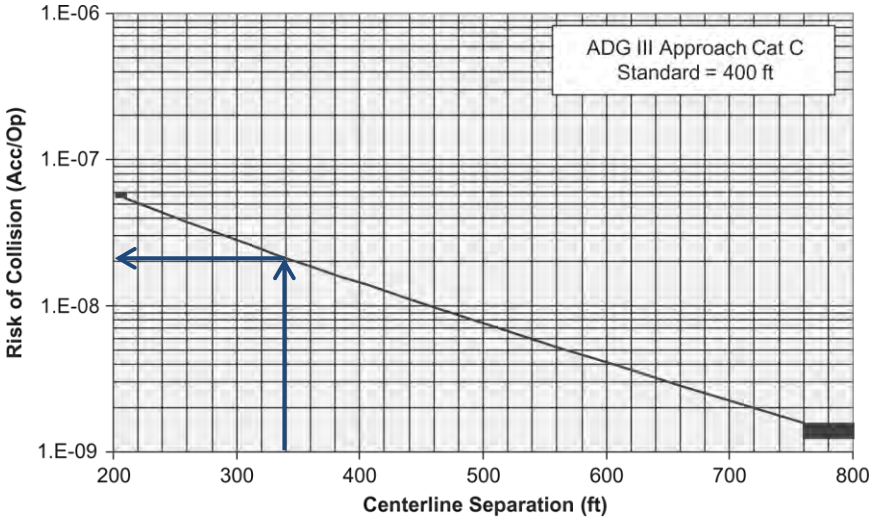


Figure AA-50. Takeoff veer-off collision risk for ADG III.

Source: ACRP Report #51

As the risk is one incident in every 40 million landings, the occurrence is calculated as 40 million divided by 25,000 operations per year which equates to one incident every 1,600 years.

Considering the risk of each phase of flight, the risk of collision during the landing roll is the controlling factor. The Hazard Severity Classification for this type of operation would be

catastrophic and the acceptable probability of occurrence is extremely improbable (1E-09) or less than once every 100 years. The following table summarizes the risk associated with each phase of flight:

Phase of Flight	Rate of Occurrence	Acceptable Level?
Airborne Phase	Once every 47,620 years	Yes
Landing Roll Phase	Once every 440 years	Yes
Takeoff Roll Phase	Once every 1,600 years	Yes

A Runway to Parallel Taxiway Separation of 320' appears to provide an acceptable level of risk. In addition a separation of 320' would keep any part of an aircraft on the taxiway from penetrating the RSA, the Runway Obstacle Free Zone (OFZ) and the Part 77 Primary Surface.

MOS 1B - Taxiway Object Free Area Width

The FAA design standard for Taxiway OFA for ARC C-III is 186'. The requested MOS for Taxiway OFA is 160'. This MOS is requested in conjunction with the MOS - 1A for Runway to Parallel Taxiway Separation and MOS - 1C Runway OFA Grading.

In the airport's current configuration, relocation of Parallel Taxiway B to a separation of 320 feet with a full C-III Taxiway OFA of 186 feet would require significant modification to existing airport facilities, along with property acquisition and removal of adjacent buildings. The estimated cost of these improvements is approximately $11 million dollars.

When considering the current and anticipated traffic at the airport, these improvements are not necessary. The published pavement strength for Runway 13-31 at SUN is 95,000 pounds. For the current fleet of all available aircraft, no aircraft with a maximum takeoff weight of 95,000 pounds or less has a wingspan of greater than 100 feet. Therefore, existing and anticipated aircraft traffic will include only aircraft with wingspans less than 100 feet.

Equation #2 from Table 1 in EB #78 gives the separation from centerline to an object as 0.7 x Wingspan + 10 feet. Using this equation and a wingspan of 100', an aircraft specific Taxiway OFA is calculated at 160 feet. For the aircraft that use and are anticipated to use the airport, this Taxiway OFA meets standards and therefore will provide an acceptable level of safety.

In addition, ACRP Report #51 provides the methodology for analyzing the risk of taxiway to object separations. Using the separation of 80' and Figure AA-10 in Appendix A of ACRP Report #51, provides a risk level 2.5E-09 or one chance in 400 million operations. This can be seen in the figure below:

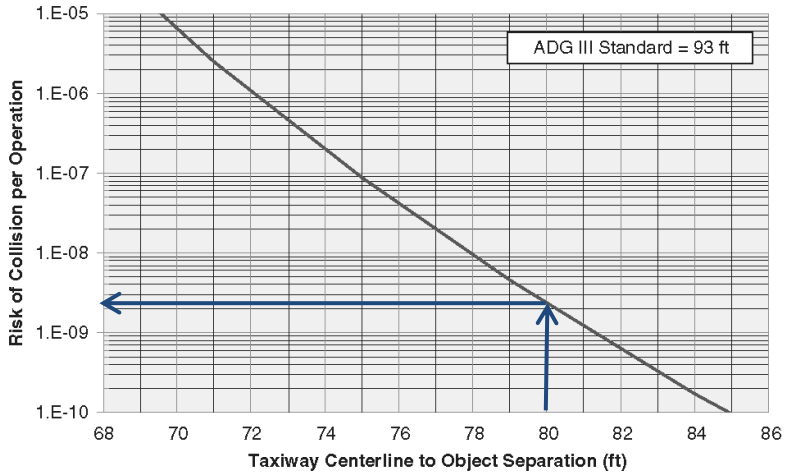


Figure AA-10. Collision risk associated with taxiway to object separation for ADG III.

Source: ACRP Report #51

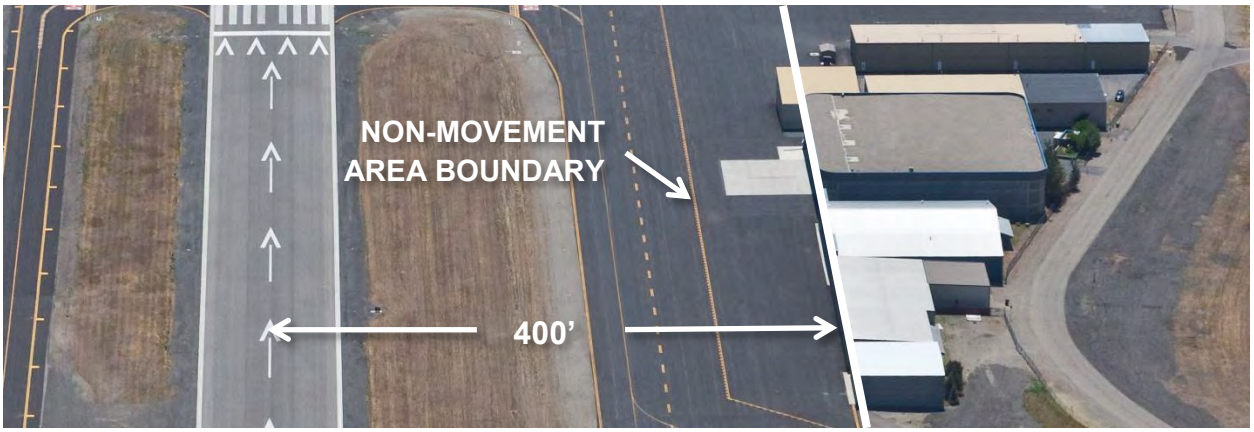
As the risk is one incident in every 400 million operations, the occurrence is calculated as 400 million divided by 50,000 operations per year which equates to one incident every 8,000 years.

The Hazard Severity Classification for this type of operation would be major and the acceptable probability of occurrence is remote (1E-05) or less than once every 1-10 years. A Taxiway OFA of 160’ appears to provide an acceptable level of safety especially when considering the current and future aircraft fleet.

MOS 1C - Runway Object Free Area Transverse Grading

The FAA design standard for maximum transverse OFA grading for ADG III is a 10:1 slope for the first 59' of the OFA followed by a maximum slope of 4:1. The requested MOS for maximum transverse OFA grade is a 4:1 slope from the edge of OFA. This MOS is requested in conjunction with MOS - 1A for Runway to Parallel Taxiway Separation and MOS 1B - Parallel Taxiway OFA. This MOS is not required if MOS 3 - Runway Safety Area Grading is approved.

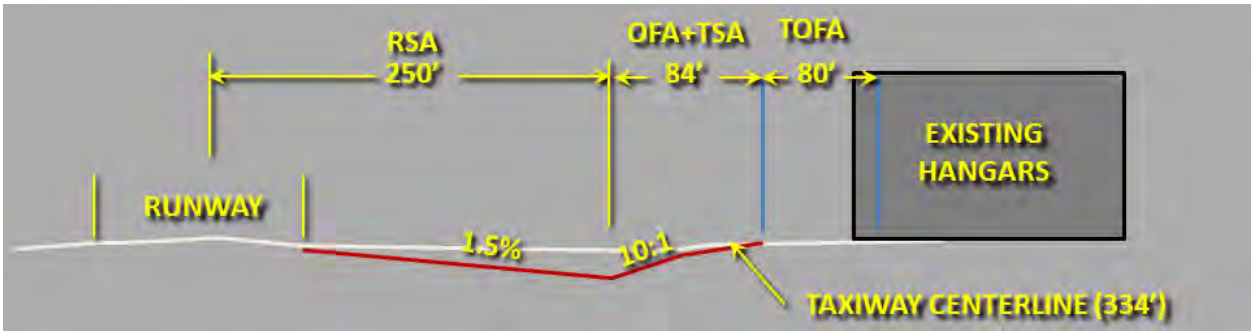
There is one area at the north end of the airfield, where meeting a 10:1 slope incurs significant impacts and cost. At the north end of the airfield, a series of existing hangars are located at approximately 400' from the runway centerline. The estimated cost of relocating these hangars is approximately $7 Million dollars. This cost does not include any land acquisition costs to accommodate the similar size hangars. The hangars are shown in the figure below:



Source: T-O Engineers

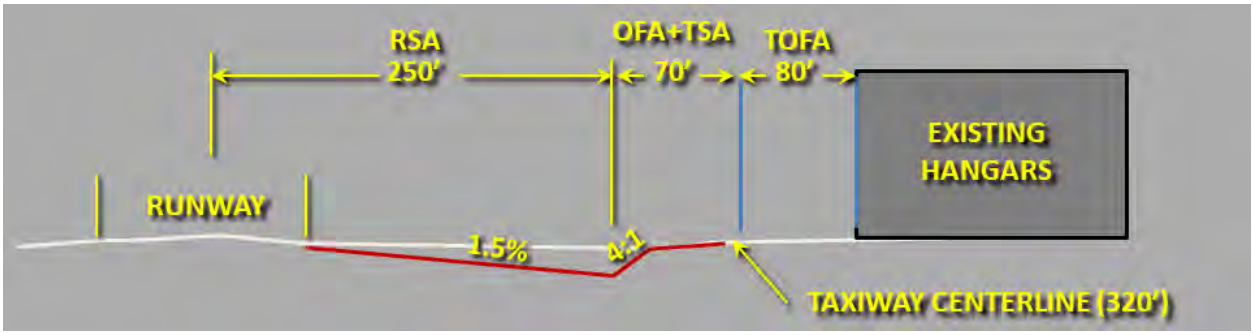
For reference, the current runway to parallel taxiway separation is 250' and a separation of 320' would place the taxiway centerline on the non-movement area boundary marking shown to the right in the photo above. One hangar is currently located less than 400' from the runway centerline and is planned to be removed.

In this area, the existing RSA grades are less than the minimum of 1.5%. Meeting the minimum transverse RSA grade of 1.5% requires removal of up to 4.5' of material at the outside edge of the RSA. In this area, the new RSA grade would be below the TSA and using the maximum allowable grades in the TSA decreases the total elevation change between the RSA and TSA to approximately 2.5', requiring 25' of grading at a 10:1 slope. This grading combined with the RSA grading and TSA grading results in a minimum runway to parallel taxiway separation of 334' and is shown in the figure below:



Source: T-O Engineers

If the parallel taxiway were located at 334' from runway centerline, the hangars shown above would need to be removed as they would be located inside the aircraft specific Taxiway OFA of 160'. Allowing a maximum OFA grade of 4:1 results in a minimum runway to parallel taxiway separation of 319' and would not impact the hangars on the north end. This is shown in the figure below:



Source: T-O Engineers

Prior to the release of AC 150/5300-13A, the previous maximum gradient for the Runway OFA was a 4:1 slope. This MOS is required due to the recent change in the design standard. The main hazard associated with allowing a slope of greater than a 4:1 is the risk a wingtip striking the ground in the event of an excursion from the runway.. At the north end of the airfield, the ground would penetrate approximately 30 inches above the edge of the RSA and would be the same height as an airfield light. The total cost required to meet the maximum OFA slope of a 10:1 at the north end of the airfield is in excess of $7 Million dollars. Considering the cost and benefit involved in meeting the new design standard, a slope of 4:1 inside the OFA appears to be acceptable.

MOS 2 - Runway Safety Area Transverse Grading

The FAA design standard for transverse RSA grades for ADG III is a minimum of 1.5% and a maximum of 3%. The requested MOS for transverse RSA grade is for less than 1.5%. If this MOS is approved, MOS 1C – Runway Object Free Area Transverse Grading is not required.

Meeting the minimum gradient of 1.5% at SUN requires the removal of 300,000 cubic yards of earthwork. In order to accomplish this, 250,000 cubic yards of earthwork would have to be disposed of off of airport property. The estimated cost of disposing of the material is in excess of $3.5 Million dollars. In addition, nearly the entire storm drainage system would need to be removed and relocated in order to meet the new grades. This includes 10,000 feet of pipe along with 30 aircraft rated inlets. The estimated cost of relocating the storm drainage system is $1.5 Million dollars. The work required to grade the RSA and relocate the storm drainage system would require the airport to be closed for 90 days. In the mountain environment of Hailey this work would have to take place in the summer months and would require the runway to be closed during the peak travel season.

When considering this MOS it is important to understand the purpose of the RSA. Paragraph 307 of Advisory Circular 150/5300-13A gives the purpose of the RSA:

> *"The RSA enhances the safety of aircraft which undershoot, overrun or veer off the runway, and it provides greater accessibility for fire-fighting and rescue equipment during such incidents."*

Paragraph 307 b. of Advisory Circular 150/5300-13A defines the requirements of the RSA:

> *"(1) cleared and graded and have no potentially hazardous ruts, humps, depressions, or other surface variations;*
>
> *(2) drained by grading or storm sewers to prevent water accumulation;*
>
> *(3) capable under dry conditions of supporting snow removal equipment, Aircraft Rescue and Fire Fighting (ARFF) equipment, and the occasional passage of aircraft; and*
>
> *(4) free of objects, except for objects that need to be relocated in the RSA because of their function."*

As the purpose of the RSA is to enhance the safety of aircraft in the event of a departure from the runway, the distance an aircraft departs from the runway is affected by three (3) major elements: weight of the aircraft, speed of the aircraft and RSA gradient. The third variable and the subject of this modification, the RSA gradient, affects the rate at which an aircraft slows after departing the runway. The steeper the gradient the longer it will take for an aircraft to stop. The existing transverse RSA gradients at SUN are flatter than standard; meaning an aircraft would actually come to a stop sooner if all other variables were equal. Paragraph 307 f in AC 5300-13 describes this condition:

"Keeping negative grades to the minimum practicable contributes to the effectiveness of the RSA."

Though flatter than standard, the RSA at SUN is graded smoothly and is capable of safely accommodating an aircraft without damage, in the case of a veer off.

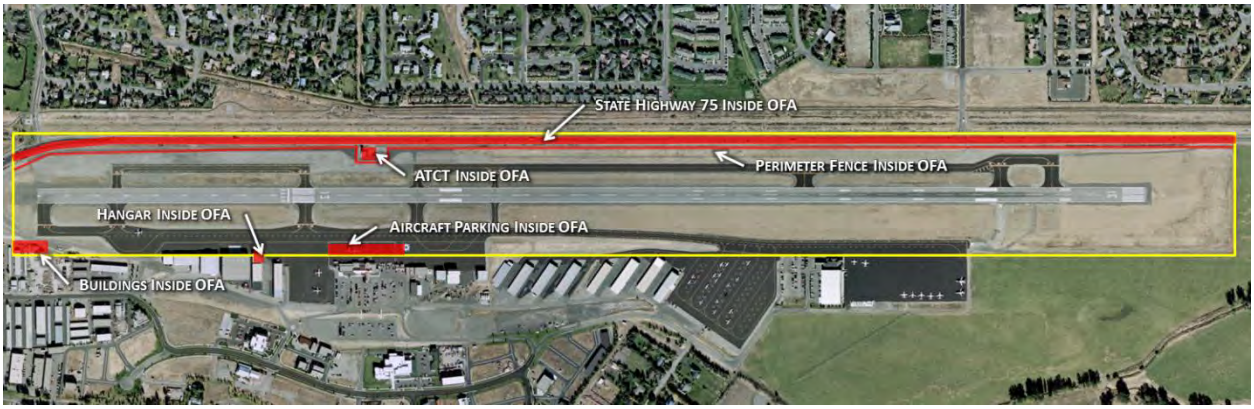
The negative aspect of gradients flatter than standard are their inability to adequately drain the RSA during rainfall events. The existing RSA at SUN drains extremely well, with no accumulation of standing water. Existing soils have a very high permeability and the local climate is dry, with an average annual rainfall of only 16 inches. In addition, the runway is equipped with a storm drainage system that collects and removes drainage efficiently. The following table summarizes the design requirements that would be met at SUN:

RSA Requirement	Standard Met
Cleared and Graded	Yes
Drained by grading or storm sewers	Yes
Capable of supporting SRE, ARFF and aircraft	Yes
Free of objects	Yes

The total estimated cost of meeting the minimum transverse grade of a 1.5% is $5 Million dollars and will require a full airport closure for 3 months. As the proposed RSA at SUN will meet the RSA requirements defined in AC 5300-13A, the grades flatter than standard will provide an acceptable level of safety.

MOS 3 - Runway Object Free Area (OFA) Width

The FAA design standard for Runway OFA Width for ARC C-III is 800', centered on the runway. The deficiencies in the existing Runway OFA at SUN are shown in the Figure below:

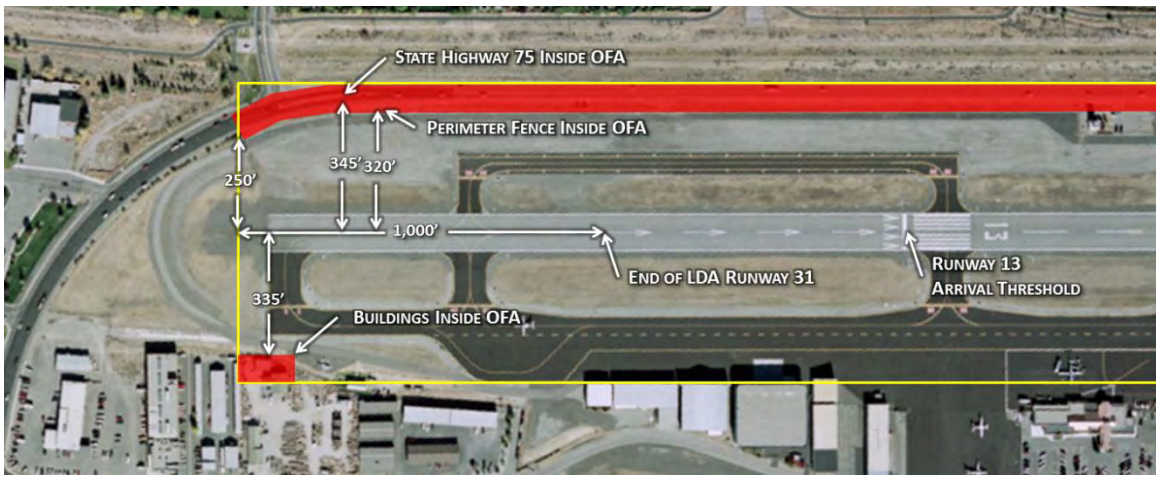


Source: T-O Engineers

The current deficiencies include:

- ATCT Inside OFA (To be relocated)
- Aircraft Parking Inside OFA (To be relocated)
- Hangar Inside OFA (To be relocated)
- Perimeter Fence Inside OFA (250'-320' from Runway CL)
- State Highway 75 Inside OFA (275'-345' from Runway CL)
- Off Airport Buildings Inside OFA (335' from Runway CL)

This MOS only includes the Perimeter Fence, State Highway 75 and the Off Airport Buildings inside the OFA; all of which are located off or at the edge of airport property. The remainder of the OFA deficiencies are located on airport property and could be relocated. State Highway 75 and the Perimeter Fence run parallel to Runway 13-31 from south to north until approximately 210' from the Runway 13 pavement end at which point they curve toward the runway until they are a minimum distance of 250' for the Perimeter Fence and 275' for State Highway 75 from the extended runway centerline. The following figure shows the deficiencies on the north end of the airfield in more detail:



Source: T-O Engineers

As SUN is currently configured using declared distances, the OFA for arrivals and departures in each direction have different deficiencies. The OFA to the east of Runway 13-31 for both arrivals and departures is penetrated by both State Highway 75 and the Perimeter Fence at 345' and 320' respectively. The OFA for Runway 13 departures and Runway 31 arrivals are penetrated to a greater degree at the north end of the airfield by the Perimeter Fence and State Highway 75 along with two buildings located off airport property. The deficiencies are summarized in the following table:

Runway OFA	State Highway 75	Perimeter Fence	Off Airport Buildings
13 Arrivals	345'	320'	None
13 Departures	275' to 345'	250' to 320'	335'
31 Arrivals	275' to 345'	250' to 320'	335'
31 Departures	345'	320'	None

Relocating the perimeter fence is not possible without the relocation of State Highway 75. A large residential neighborhood is located to the east of the SH 75 and the relocation of State Highway 75 closer to the residential neighborhood would raise significant environmental concerns including Historical Resources, Noise and Environmental Justice. Environmental impacts notwithstanding, the estimated costs to relocate State Highway 75 are in excess of $17 Million dollars.

The buildings located outside of airport property are currently located in an area zoned as light industrial. As the availability of light industrial land in the area is very low, the land is highly desirable. The estimated cost to acquire the light industrial land and remove the structures is $2 Million dollars.

When analyzing the risk associated with a reduction in Runway OFA it is important to consider the purpose of the design standard. Paragraph 309 of Advisory Circular 150/5300-13A defines the OFA but does not give the design rational behind the standard:

> *"The ROFA is centered about the runway centerline. The ROFA clearing standard requires clearing the ROFA of above-ground objects protruding above the nearest point of the RSA."*

Appendix 8, Paragraph 4 of Advisory Circular 150/5300-13 Change 18 provides the only available reference to the design rationale behind the Runway OFA width:

> *"The ROFA is a result of an agreement that a minimum 400-foot (120 m) separation from runway centerline is required for equipment shelters, other than localizer equipment shelters."*

Below is a summary of RSA and OFA width for each Runway Design Code (RDC):

RDC	RSA Width	OFA Width
A/B-I Small	120'	250'
A/B-I	120'	400'
A/B-II	150'	500'
A/B-III	300'	800'
C-I through E-IV	500'	800'

Source: AC 150/5300-13A

As shown in the table above, the OFA width for any RDC above A/B-II is 800'. This means an airport such as SUN serving the Canadair Regional Jet 700 and the Bombardier Q400 with a Non Precision approach has the same size OFA as Denver International or SEATAC airports, which serve very large commercial aircraft (such as the Boeing 747) with CAT III Precision approaches. Logically it appears a smaller OFA would be acceptable for smaller aircraft. The risk analysis procedure outlined in ACRP Report #51 appears to substantiate this.

Using the same risk based analysis as in the Runway to Parallel Taxiway Separation, there are three separate objects that must be considered; the Perimeter Fence, State Highway 75 and the buildings located off airport property. The risk associated with allowing each of these to remain will be analyzed separately.

Perimeter Fence (250' Separation)

The Perimeter Fence at the northernmost corner on the OFA is located 250' from the extended runway centerline. The risks associated with each of the phases of flight are analyzed below:

Airborne Landing Phase - Using the separation of 250' and Figure AA-33 in Appendix A of ACRP Report #51, the following provides a risk level 2.6E-09 or one chance in 384 million landings. This can be seen in the figure below:

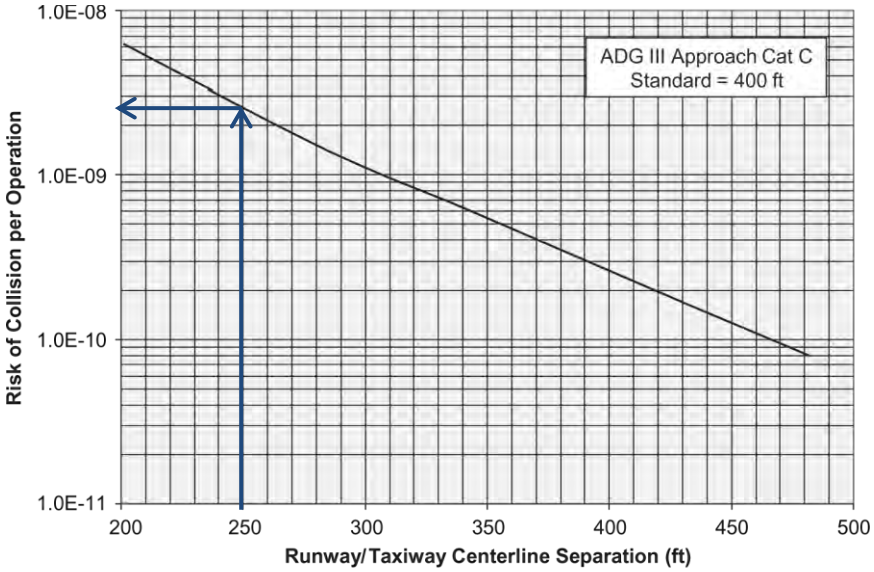


Figure AA-33. Missed approach collision risk for ADG III Cat I.

Source: ACRP Report #51

The current annual number of landing operations at SUN is approximately 25,000 or half of the 50,000 annual operations. As the risk is one incident in every 384 million landings, the rate of occurrence is calculated as 384 million landings divided by 25,000 landing operations per year which equates to one incident every 15,360 years.

Landing Roll Phase - Using the separation of 250' and Figure AA-43 in Appendix A of ACRP Report #51, provides a risk level 1.6E-07 or one chance in 6.25 million landings. This can be seen in the figure below:

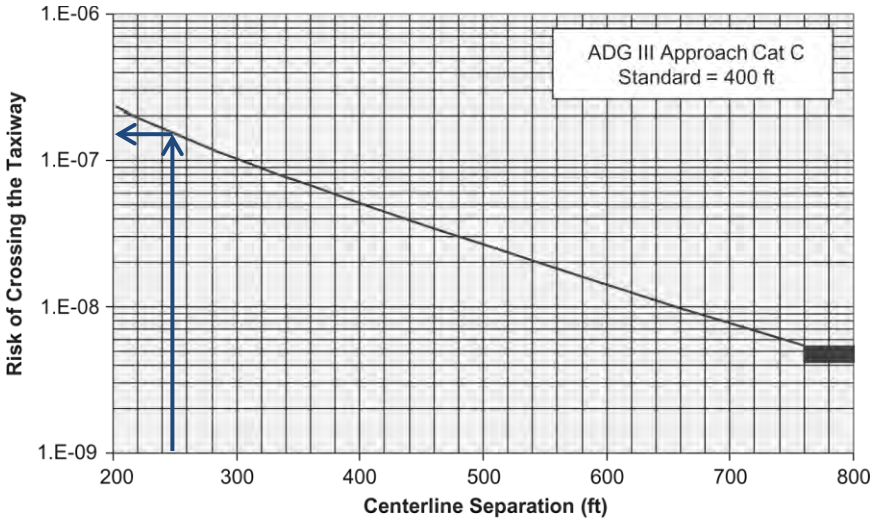


Figure AA-43. Landing veer-off collision risk for ADG III.

Source: ACRP Report #51

As the risk is one incident in every 6.25 million landings, the rate of occurrence is calculated as 6.25 million landings divided by 25,000 landings per year which equates to one incident every 250 years.

Takeoff Roll Phase - Using the separation of 250' and Figure AA-50 in Appendix A of ACRP Report #51, provides a risk level 4E-08 or one chance in 25 million takeoffs. This can be seen in the figure below:

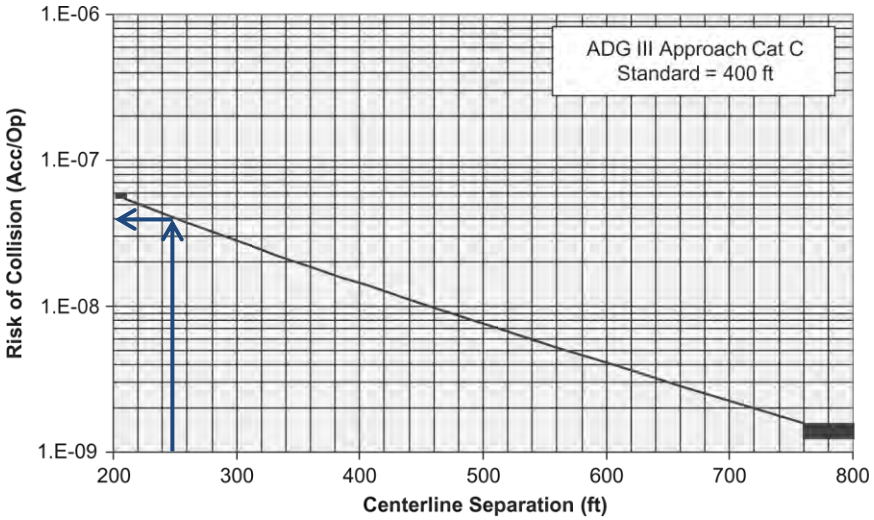


Figure AA-50. Takeoff veer-off collision risk for ADG III.

Source: ACRP Report #51

As the risk is one incident in every 25 million takeoffs, the rate of occurrence is calculated as 25 million takeoffs divided by 25,000 takeoffs per year which equates to one incident every 1,000 years.

Considering the risk of each phase of flight, the risk of collision during the landing roll is the controlling factor. The Hazard Severity Classification for this type of operation would be major and the acceptable probability of occurrence is remote (1E-05) or less than once every 1-10 years. The following table summarizes the risk associated with each phase of flight:

Phase of Flight	Rate of Occurrence	Acceptable Level
Airborne Phase	Once every 15,360 years	Yes
Landing Roll Phase	Once every 250 years	Yes
Takeoff Roll Phase	Once every 1,000 years	Yes

A Runway to object separation of 250' appears to provide an acceptable level of risk as the controlling occurrence is once every 250 years.

Perimeter Fence (320' Separation)

The Perimeter Fence runs along the east side of Runway 13-31 OFA and is located 320' from the extended runway centerline. The risks associated with each of the phases of flight are exactly the same as those for a Runway to Parallel Taxiway Separation of 320':

- Airborne Landing Phase - one incident every 47,620 years
- Landing Roll Phase - one incident every 440 years
- Takeoff Roll Phase - one incident every 1,600 years

Considering the risk of each phase of flight, the risk of collision during the landing roll is the controlling factor. The Hazard Severity Classification for this type of operation would be major and the acceptable probability of occurrence is remote (1E-05) or less than once every 1-10 years. A Runway to object separation of 250' appears to provide an acceptable level of risk as the controlling rate of occurrence is once every 440 years.

State Highway 75 (275' Separation)

State Highway 75 at the northernmost corner on the OFA is located 275' from the extended runway centerline. The risks associated with each of the phases of flight are analyzed below:

Airborne Landing Phase - Using the separation of 275' and Figure AA-33 in Appendix A of ACRP Report #51, the following provides a risk level 1.8E-09 or one chance in 555 million landings. This can be seen in the figure below:

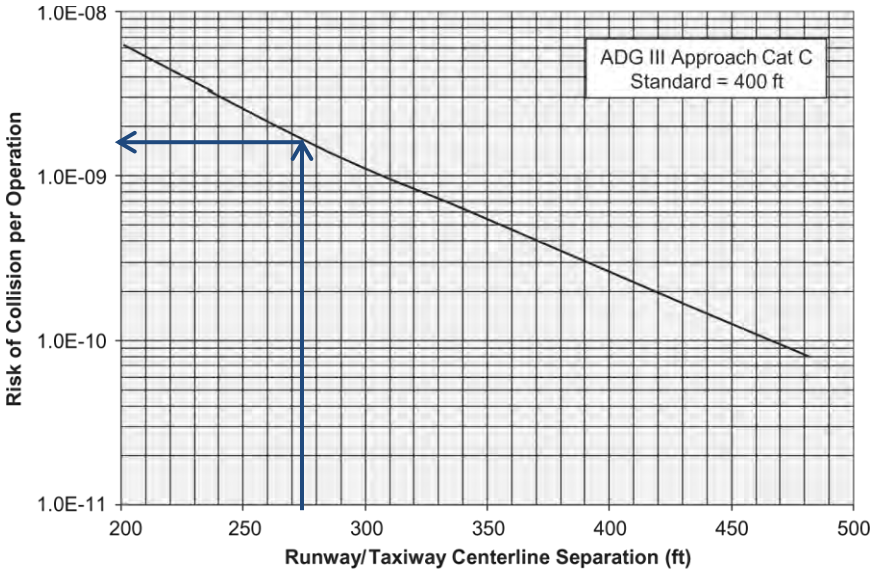


Figure AA-33. Missed approach collision risk for ADG III Cat I.

Source: ACRP Report #51

The current annual number of landing operations at SUN is approximately 25,000 or half of the 50,000 annual operations. As the risk is one incident in every 555 million landings, the rate of occurrence is calculated as 555 million landings divided by 25,000 landing operations per year which equates to one incident every 22,200 years.

Landing Roll Phase - Using the separation of 275' and Figure AA-43 in Appendix A of ACRP Report #51, provides a risk level 1.2E-07 or one chance in 8.33 million landings. This can be seen in the figure below:

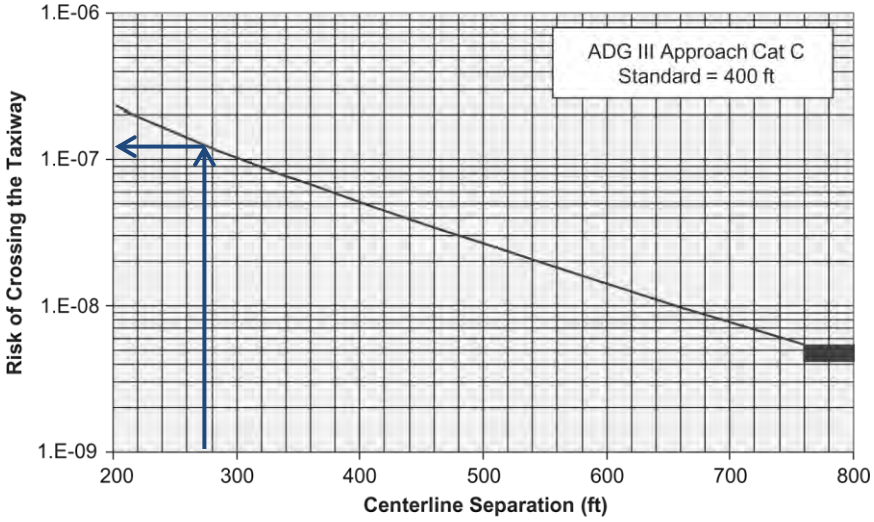


Figure AA-43. Landing veer-off collision risk for ADG III.

Source: ACRP Report #51

As the risk is one incident in every 8.33 million landings, the rate of occurrence is calculated as 8.33 million landings divided by 25,000 landings per year which equates to one incident every 333 years.

Takeoff Roll Phase - Using the separation of 275' and Figure AA-50 in Appendix A of ACRP Report #51, provides a risk level 3.2E-08 or one chance in 31 million takeoffs. This can be seen in the figure below:

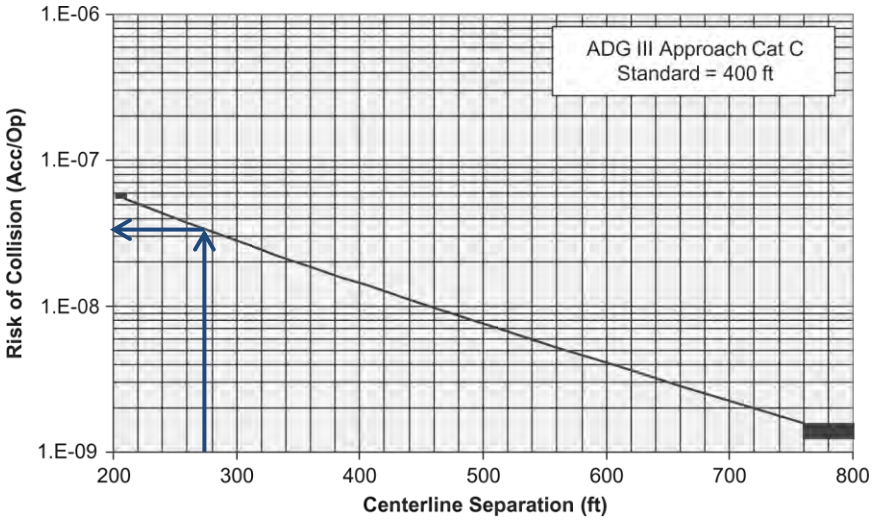


Figure AA-50. Takeoff veer-off collision risk for ADG III.

Source: ACRP Report #51

As the risk is one incident in every 31 million takeoffs, the rate of occurrence is calculated as 31 million takeoffs divided by 25,000 takeoffs per year which equates to one incident every 1,240 years.

Considering the risk of each phase of flight, the risk of collision during the landing roll is the controlling factor. The Hazard Severity Classification for this type of operation would be catastrophic and the acceptable probability of occurrence is extremely improbable (1E-09) or less than once every 100 years. The following table summarizes the risk associated with each phase of flight:

Phase of Flight	Rate of Occurrence	Acceptable Level
Airborne Phase	Once every 22,200 years	Yes
Landing Roll Phase	Once every 333 years	Yes
Takeoff Roll Phase	Once every 1,240 years	Yes

A Runway to Object Separation of 275' appears to provide an acceptable level of risk as the controlling rate of occurrence is once every 333 years.

State Highway 75 (345' Separation)

State Highway 75 runs along the east side of the Runway 13-31 OFA and is located 345' from the extended runway centerline. The risks associated with each of the phases of flight are analyzed below:

Airborne Landing Phase - Using the separation of 345' and Figure AA-33 in Appendix A of ACRP Report #51, the following provides a risk level 6E-10 or one chance in 1.7 billion landings. This can be seen in the figure below:

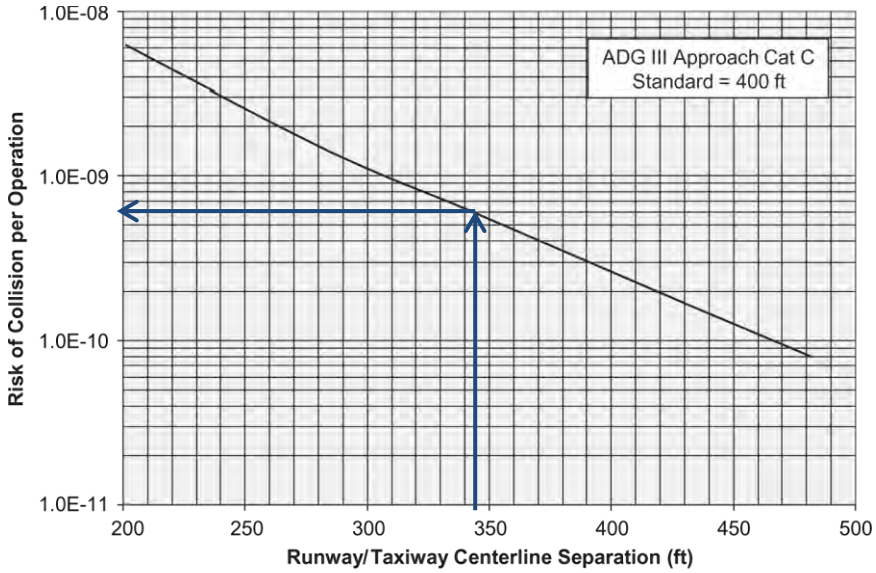


Figure AA-33. Missed approach collision risk for ADG III Cat I.

Source: ACRP Report #51

The current annual number of landing operations at SUN is approximately 25,000 or half of the 50,000 annual operations. As the risk is one incident in every 1.7 billion landings, the rate of occurrence is calculated as 1.7 billion landings divided by 25,000 landing operations per year which equates to one incident every 66,666 years.

Landing Roll Phase - Using the separation of 345' and Figure AA-43 in Appendix A of ACRP Report #51, provides a risk level 7E-08 or one chance in 14 million landings. This can be seen in the figure below:

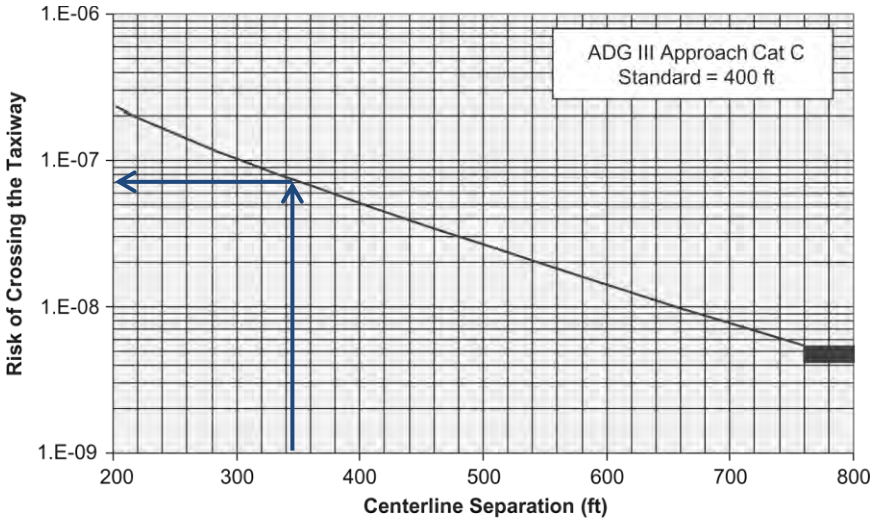


Figure AA-43. Landing veer-off collision risk for ADG III.

Source: ACRP Report #51

As the risk is one incident in every 14 million landings, the rate of occurrence is calculated as 14 million landings divided by 25,000 landings per year which equates to one incident every 571 years.

Takeoff Roll Phase - Using the separation of 345' and Figure AA-50 in Appendix A of ACRP Report #51, provides a risk level 2E-08 or one chance in 50 million takeoffs. This can be seen in the figure below:

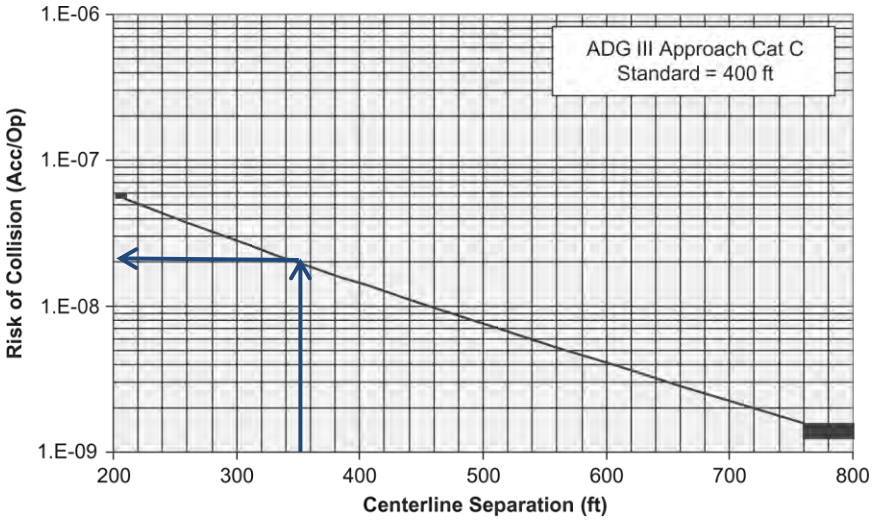


Figure AA-50. Takeoff veer-off collision risk for ADG III.

Source: ACRP Report #51

As the risk is one incident in every 50 million takeoffs, the rate of occurrence is calculated as 50 million takeoffs divided by 25,000 takeoffs per year which equates to one incident every 2,000 years.

Considering the risk of each phase of flight, the risk of collision during the landing roll is the controlling factor. The Hazard Severity Classification for this type of operation would be catastrophic and the acceptable probability of occurrence is extremely improbable (1E-09) or less than once every 100 years. The following table summarizes the risk associated with each phase of flight:

Phase of Flight	Rate of Occurrence	Acceptable Level
Airborne Phase	Once every 66,666 years	Yes
Landing Roll Phase	Once every 571 years	Yes
Takeoff Roll Phase	Once every 2,000 years	Yes

A Runway to Object Separation of 345' appears to provide an acceptable level of risk as the controlling rate of occurrence is once every 571 years.

Buildings Located Off Airport Property (335' Separation)

The buildings located at the northernmost corner on the west side of the OFA are located 335' from the extended runway centerline. The risks associated with each of the phases of flight are analyzed below:

Airborne Landing Phase - Using the separation of 335' and Figure AA-33 in Appendix A of ACRP Report #51, the following provides a risk level 6E-10 or one chance in 1.6 billion landings. This can be seen in the figure below:

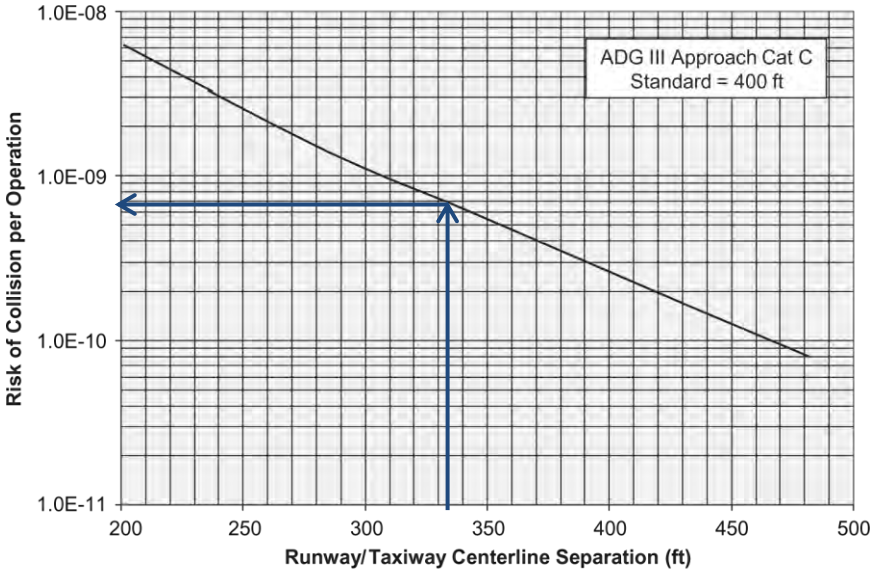


Figure AA-33. Missed approach collision risk for ADG III Cat I.

Source: ACRP Report #51

The current annual number of landing operations at SUN is approximately 25,000 or half of the 50,000 annual operations. As the risk is one incident in every 1.6 billion landings, the rate of occurrence is calculated as 1.6 billion landings divided by 25,000 landing operations per year which equates to one incident every 64,000 years.

Landing Roll Phase - Using the separation of 335' and Figure AA-43 in Appendix A of ACRP Report #51, provides a risk level 8E-08 or one chance in 12.5 million landings. This can be seen in the figure below:

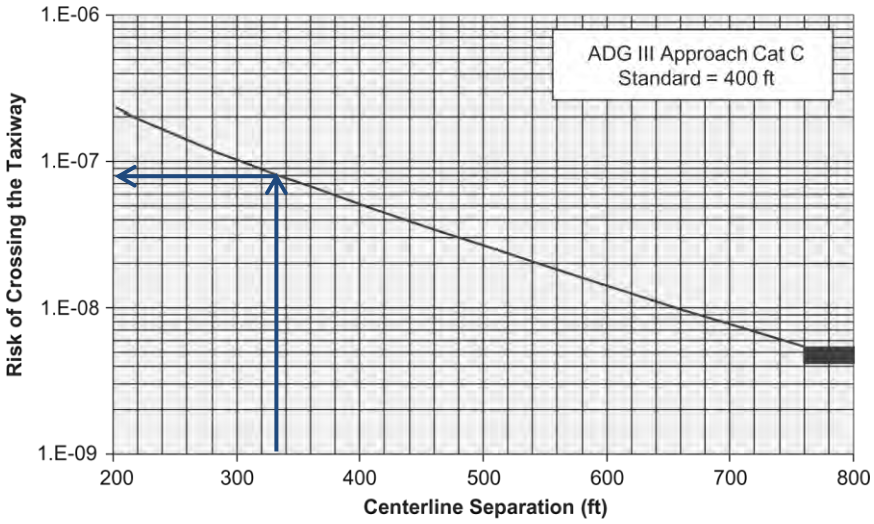


Figure AA-43. Landing veer-off collision risk for ADG III.

Source: ACRP Report #51

As the risk is one incident in every 12.5 million landings, the rate of occurrence is calculated as 12.5 million landings divided by 25,000 landings per year which equates to one incident every 500 years.

Takeoff Roll Phase - Using the separation of 335' and Figure AA-50 in Appendix A of ACRP Report #51, provides a risk level 2.2E-08 or one chance in 45 million takeoffs. This can be seen in the figure below:

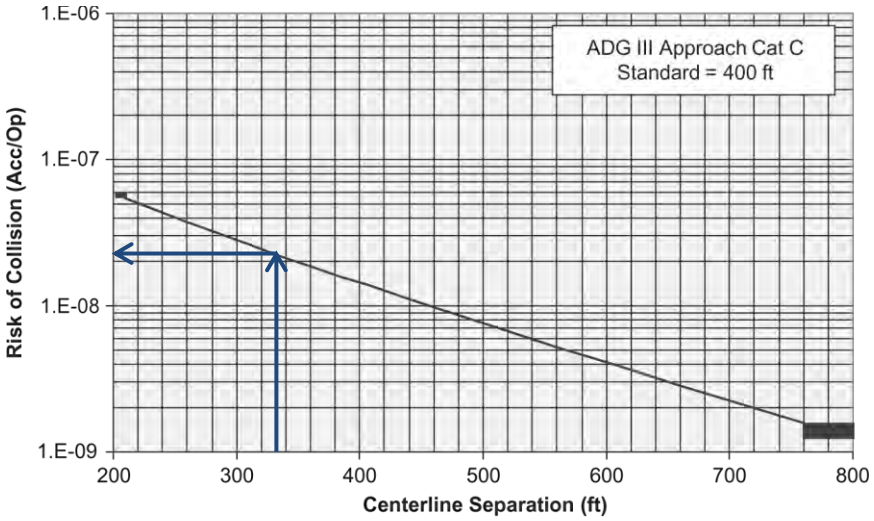


Figure AA-50. Takeoff veer-off collision risk for ADG III.

Source: ACRP Report #51

As the risk is one incident in every 45 million takeoffs, the rate of occurrence is calculated as 45 million takeoffs divided by 25,000 takeoffs per year which equates to one incident every 1,800 years.

Considering the risk of each phase of flight, the risk of collision during the landing roll is the controlling factor. The Hazard Severity Classification for this type of operation would be catastrophic and the acceptable probability of occurrence is extremely improbable (1E-09) or less than once every 100 years. The following table summarizes the risk associated with each phase of flight:

Phase of Flight	Rate of Occurrence	Acceptable Level
Airborne Phase	Once every 64,000 years	Yes
Landing Roll Phase	Once every 500 years	Yes
Takeoff Roll Phase	Once every 1,800 years	Yes

A Runway to Object Separation of 335' appears to provide an acceptable level of risk as the controlling rate of occurrence is once every 500 years.

For each of the various object separations the Landing Roll phase of flight provided the controlling risk. Each of the separations and the associated rate of occurrence are summarized in the following table:

Object (Separation)	Controlling Phase of Flight	Hazard Severity Classification	Rate of Occurrence	Acceptable Level?

Perimeter Fence (250')	Landing Roll	Major	Once every 250 years	Yes
Perimeter Fence (320')	Landing Roll	Major	Once every 440 years	Yes
State Highway 75 (275')	Landing Roll	Catastrophic	Once every 333 years	Yes
State Highway 75 (345')	Landing Roll	Catastrophic	Once every 571 years	Yes
Off Airport Buildings (335')	Landing Roll	Catastrophic	Once every 500 years	Yes

As shown in the table above, each of the various Runway to Object Separations provide an acceptable level of risk. In addition, the closest separations are all located on the north end of the airfield. Though each of these penetrates the departure OFA for Runway 13, the risk of an incident is actually much lower as an aircraft would be taking off in the opposite direction of the objects. For arrivals on Runway 31, due to the use of declared distances, the objects are located a minimum of 1,000' from the end of the runway declared suitable for landing operations. Their location is modeled as if the objects are located laterally to the runway and as such the actual risk of an incident is much lower.

MOS 4 - Runway to Aircraft Parking Separation

The FAA design standard for Runway to Aircraft Parking Separation for ARC C-III is 500'. The requested MOS for Runway to Aircraft Parking Separation is 400'. This MOS is not applicable if MOS 1A, 1B, or 1C are not approved.

A separation to the C-III standard of 500' could be met in one of two ways, either shift Runway 13-31 and State Highway 75 to the east or relocate the majority of apron parking on the airfield including the terminal, to the southwest. The estimated costs of each alternative are shown below:

- Shift Runway 13-31 and State Highway 75 East - $144 Million dollars
- Shift Airfield Parking and Terminal Southwest - $30 Million dollars

The maximum separation possible at SUN without major impacts to airfield facilities is 400' from Runway 13-31 centerline. When analyzing the level of safety associated with a reduction in Runway to Aircraft Parking Separation it is important to consider the purpose of the design standard. Paragraph 321 a. (3) of Advisory Circular 150/5300-13A provides the design rationale:

> *"Runway to aircraft parking area separation is determined by the landing and takeoff flight path profiles and physical characteristics of the aircraft. The runway to parking area separation standard precludes any part of a parked aircraft (tail, wingtip, nose, etc.) from being within the ROFA or penetrating the OFZ."*

A Runway to Aircraft Parking Separation of 400' at SUN will preclude any part of an aircraft from penetrating the Runway OFA or Runway OFZ. In addition, a separation of 400 feet would also provide the following benefits:

- Prevent parked aircraft from penetrating the Runway Primary Surface
- Prevent parked aircraft from penetrating the Runway Transitional Surface
- Prevent parked aircraft from penetrating the Taxiway OFA

As the runway to aircraft parking area separation of 400 feet meets the purpose of this standard as stated in AC 150/5300-13A, this configuration will provide an acceptable level of safety.

APPENDIX D - MOS
RUNWAY OFA

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION
NORTHWEST MOUNTAIN REGION
AIRPORT IMPROVEMENT PROGRAM

MODIFICATION OF AIRPORT DESIGN STANDARDS

BACKGROUND

1. AIRPORT: **Friedman Memorial Airport**	2. LOCATION(CITY,STATE): **Hailey, ID**	3. LOC ID: **SUN**
4. EFFECTED RUNWAY/TAXIWAY: **RUNWAY 13-31**	5. APPROACH (EACH RUNWAY): **RW 13 VISUAL** **RW 31 NPI**	6. AIRPORT REF. CODE (ARC): **C-III**

7. DESIGN AIRCRAFT (EACH RUNWAY/TAXIWAY): **Bombardier Q-400 and Gulfstream G-V**

MODIFICATION OF STANDARDS

8. TITLE OF STANDARD BEING MODIFIED (CITE REFERENCE DOCUMENT):

Runway Object Free Area (OFA), Advisory Circular 150/5300-13A, *Airport Design* (AC 150/5300-13A)

9. STANDARD/REQUIREMENT:

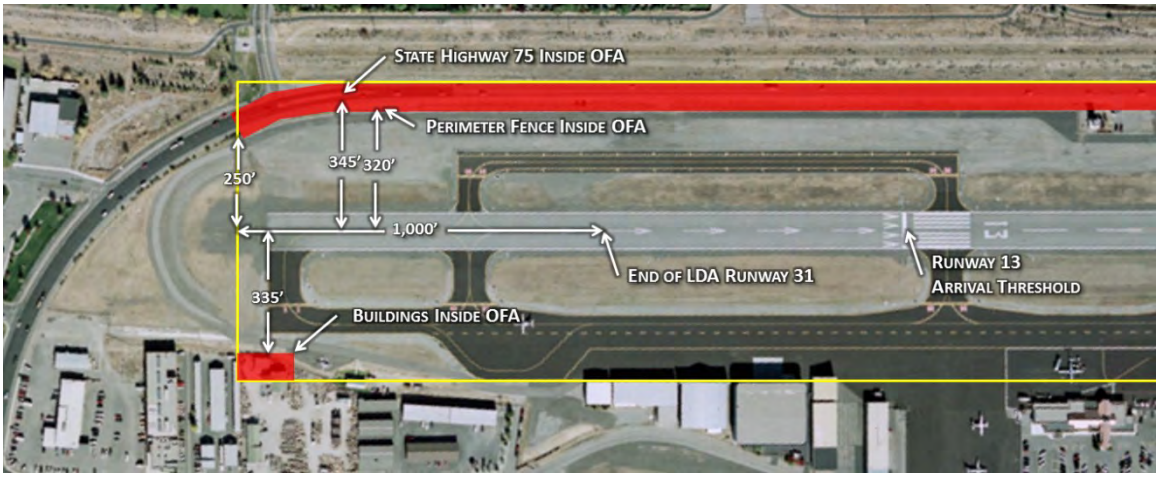
800 feet (400 foot either side of centerline) per Table 3-8 on page 94 of AC 150/5300-13A.

10. PROPOSED:

Varies see below.

11. EXPLAIN WHY STANDARD CANNOT BE MET (FAA ORDER 5300.1E):

State Highway 75 and the Perimeter Fence run parallel to Runway 13-31 from south to north until approximately 210' from the Runway 13 pavement end at which point they curve toward the runway until they are a minimum distance of 250' for the Perimeter Fence and 275' for State Highway 75 from the extended runway centerline. The following figure shows the deficiencies on the north end of the airfield in more detail:



As SUN is currently configured using declared distances, the OFA for arrivals and departures in each direction have different deficiencies. The OFA to the east of Runway 13-31 for both arrivals and departures is penetrated by both State Highway 75 and the Perimeter Fence at 345' and 320' respectively. The OFA for Runway 13 departures and Runway 31 arrivals are penetrated to a greater degree at the north end of the airfield by the Perimeter Fence and State Highway 75 along with two buildings located off airport property. The deficiencies are summarized in the following table:

Runway OFA	State Highway 75	Perimeter Fence	Off Airport Buildings
13 Arrivals	345'	320'	None
13 Departures	275' to 345'	250' to 320'	335'
31 Arrivals	275' to 345'	250' to 320'	335'
31 Departures	345'	320'	None

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION
NORTHWEST MOUNTAIN REGION
AIRPORT IMPROVEMENT PROGRAM

MODIFICATION OF AIRPORT DESIGN STANDARDS

In order to meet OFA requirements either the Runway and all airport facilities would have to be shifted to the West or State Highway 75 would have to be shifted to the East.

Neither of these options are seen as practicable and providing a less than standard OFA will provide an acceptable level of safety, based on the aircraft traffic at the airport.

12. DISCUSS VIABLE ALTERNATIVES (FAA ORDER 5300.1E):

The airport sponsor has considered three alternatives to provide a Runway OFA at the airport that complies with standards. The first two alternatives, though viable, are not practicable, due to cost and environmental impact.

1. Relocate Runway And All Airport Facilities To The West – Not Practicable
    - Essentially reconstructs the entire airport west of existing facilities, including the terminal, FBO facilities, all hangars and maintenance/ARFF facilities.
    - Total estimated cost exceeds $144 million.
2. Relocate Highway to the East – Not Practicable
    - Requires relocation of approximately 2 miles of State Highway 75 approximately 75 feet to the east.
    - A large neighborhood exists east of the airport in this location and relocating the highway will greatly increase the environmental impact of the highway on that neighborhood. Idaho Transportation Department has completed an Environmental Impact Statement study for a proposed project on this highway, which identifies the following environmental impacts of the highway in this location, all of which would be exacerbated significantly by relocating the highway as described. Note that an environmental analysis for the proposed action relative to the airport has not been completed – these impacts are identified based on previous studies and would require further evaluation.
        - Historical Resources: Relocation of the highway would require removal of a railroad berm that has been identified as a potential historic structure.
        - Noise: The noise levels of a relocated highway may exceed those permitted by Federal Highway Administration guidelines and require mitigation. Mitigation is difficult at this location, due to local ordinances prohibiting construction of noise walls.
        - Environmental Justice: The adjacent neighborhood is high density, with relatively low incomes and a high minority population. Based on these factors, relocating the highway could induce environmental justice impacts.
    - Costs for relocating the highway are estimated to exceed $17 million.
3. Allow Highway, Fence and Buildings To Remain
    - Do not relocate the highway.
    - Based on existing traffic at the airport, this will provide an acceptable level of safety. (See explanation below.)

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION
NORTHWEST MOUNTAIN REGION
AIRPORT IMPROVEMENT PROGRAM

MODIFICATION OF AIRPORT DESIGN STANDARDS

13. STATE WHY MODIFICATION WOULD PROVIDE ACCEPTABLE LEVEL OF SAFETY, ECONOMY, DURABILITY, AND WORKMANSHIP (FAA ORDER 5300.1E):

In 2011, the Transportation Research Board (TRB) published ACRP Report 51 – Risk Assessment Method to Support Modification of Airfield Separation Standards. This report provides a method for calculating the probability and associated risk for various runway to object separations, with the purpose of determining acceptability of modifications of standards. The method outlined in the report involves calculating the risk for three separate phases of aircraft operation: airborne phase, landing roll and takeoff roll. The highest risk value is then used to evaluate whether the separation is acceptable. The report provides figures for each of the phases of aircraft operations where the runway to object separation is used to determine the risk.

Current traffic at SUN includes less than 50,000 operations (25,000 takeoffs and 25,000 landings) per year. Using these operational numbers and the procedure outlined in ACRP Report 51, the estimated risk along with the return period for each phase of operation is summarized below for each of the objects located in the Runway Object Free Area. In each case, the controlling phase of flight was the Landing Roll. The table below summarizes the risk associated with each object.

Object (Separation)	Controlling Phase of Flight	Hazard Severity Classification	Rate of Occurrence	Acceptable Level?
Perimeter Fence (250')	Landing Roll	Major	Once every 250 years	Yes
Perimeter Fence (320')	Landing Roll	Major	Once every 440 years	Yes
State Highway 75 (275')	Landing Roll	Catastrophic	Once every 333 years	Yes
State Highway 75 (345')	Landing Roll	Catastrophic	Once every 571 years	Yes
Off Airport Buildings (335')	Landing Roll	Catastrophic	Once every 500 years	Yes

As shown in the table above, each of the various Runway to Object Separations provide an acceptable level of risk. In addition, the closest separations are all located on the north end of the airfield. Though each of these penetrates the departure OFA for Runway 13, the risk of an incident is actually much lower as an aircraft would be taking off in the opposite direction of the objects. For arrivals on Runway 31, due to the use of declared distances, the objects are located a minimum of 1,000' from the end of the runway declared suitable for landing operations. Their location is modeled as if the objects are located laterally to the runway and as such the actual risk of an incident is much lower.

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION
NORTHWEST MOUNTAIN REGION
AIRPORT IMPROVEMENT PROGRAM

MODIFICATION OF AIRPORT DESIGN STANDARDS

MODIFICATION:	LOCATION:	PAGE 2 OF 2
14. SIGNATURE OF ORIGINATOR:	15. ORIGINATOR'S ORGANIZATION:	16. TELEPHONE:
17. DATE OF LATEST FAA SIGNED ALP:		
18. ADO RECOMMENDATION:	19. SIGNATURE:	20. DATE:
21. FAA DIVISIONAL REVIEW (AT, AF, FS):		

ROUTING SYMBOL	SIGNATURE	DATE	CONCUR	NON-CONCUR

COMMENTS:

22. AIRPORTS' DIVISION FINAL ACTION:

☐ UNCONDITIONAL APPROVAL	☐ CONDITIONAL APPROVAL	☐ DISAPPROVAL

DATE:	SIGNATURE:	TITLE:

CONDITIONS OF APPROVAL:

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION
NORTHWEST MOUNTAIN REGION
AIRPORT IMPROVEMENT PROGRAM

MODIFICATION OF AIRPORT DESIGN STANDARDS

ITEMS 1-17 ARE TO BE COMPLETED BY THE AIRPORT SPONSOR(ORIGINATOR). ALL OTHER ITEMS WILL BE COMPLETED BY THE FAA.

THE COMPLETED FORM WILL BE TRANSMITTED BY THE ORIGINATOR TO THE APPLICABLE ADO/AFO. THE ADO/AFO WILL TRANSMIT THE FINAL FAA DETERMINATION TO THE ORIGINATOR.

MODIFICATION TO AIRPORT DESIGN STANDARDS REQUESTS SHOULD INCLUDE SKETCHES OR DRAWINGS WHICH CLEARLY ILLUSTRATE THE NONSTANDARD CONDITION.

ITEMS

1. LEGAL NAME OF AIRPORT.

2. ASSOCIATED CITY.

3. AIRPORT LOCATION IDENTIFIER (SEE APPROACH PLATES/AIRPORT FACILITY DIRECTORY).

4. IDENTIFY THE RUNWAY(S), TAXIWAY(S) OR OTHER FACILITIES EFFECTED BY THE PROPOSED MODIFICATION TO STANDARDS REQUEST.

5. IDENTIFY THE MOST CRITICAL APPROACH FOR EACH RUNWAY IDENTIFIED IN #4.

6. AIRPORT REFERENCE CODE - SEE PARAGRAPH 2, PAGE 1 AC 150/5300-13(CHANGE 4) - I.E. C-II, B-II, A-I (SMALL).

7. NOTE THE DESIGN AIRCRAFT (ARC OR SPECIFIC AIRCRAFT) FOR EACH FACILITY IDENTIFIED IN #4. A DESIGN AIRCRAFT MUST MAKE REGULAR USE OF THE FACILITY. NORMALLY, FAA CONSIDERS REGULAR USE TO BE 500 OR MORE ANNUAL INTINERANT OPERATIONS.

IF THE AIRPORT SERVES A WHOLE FAMILY OF AIRCRAFT IN A PARTICULAR GROUP, THE ARC (I.E. B-II) SHOULD BE SPECIFIED. IF,HOWEVER, THE AIRPORT IS USED BY ONLY 1 OR 2 OF A FAMILY OF AIRCRAFT (IX- BEECH KING AIR C90), THE MOST DEMANDING (APPROACH SPEED, WINGSPAN) AIRCRAFT SHOULD BE SPECIFIED.

8. IDENTIFY THE SPECIFIC NAME OF THE STANDARD THAT IS PROPOSED TO BE MODIFIED FOR THE SUBJECT LOCAL CONDITION.
9. DESCRIBE (WORDS AND NUMBERS) THE DIMENSIONS AND REQUIREMENTS OF THE STANDARD AS PROVIDED IN AC 150/5300-13.

10. STATE THE PROPOSED MODIFICATION TO THE STANDARD.

11. DISCUSS THE LOCAL CONDITIONS THAT MAKE IT IMPRACTICAL OR IMPOSSIBLE TO MEET THE STANDARD.

12. IDENTIFY ALTERNATIVES TO THE SUBJECT PROPOSED MODIFICATION, AND SHOW WHY THESE ALTERNATIVES ARE NOT VIABLE.

13. DISCUSS HOW THE PROPOSED MODIFICATION WOULD IMPACT AIRPORT SAFETY AND EXPLAIN WHY AN ACCEPTABLE LEVEL OF SAFETY, ECONOMY, DURABILITY, AND WORKMANSHIP WOULD STILL EXIST.

14. TYPED NAME AND SIGINATURE OF AIRPORT AUTHORITY REPRESELNTATIVE.

15. SELF-EXPLANATORY.

16. SELF-EXPLANATORY.

17. SELF-EXPLANATORY.

18. TO BE COMPLETED BY FAA.

Appendix 3

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION
AIRPORT IMPROVEMENT PROGRAM

MODIFICATION OF AIRPORT CONSTRUCTION STANDARDS

SPECIFICATION & PARA. REQUESTED MODIFICATION & JUSTIFICATION

DATE **SPONSOR**

DATE **APPROVED BY (FAA)**

Attachment A

APPENDIX D - MOS
RUNWAY-TAXIWAY SEPARATION

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION
NORTHWEST MOUNTAIN REGION
AIRPORT IMPROVEMENT PROGRAM

MODIFICATION OF AIRPORT DESIGN STANDARDS

BACKGROUND

1. AIRPORT: **Friedman Memorial Airport**	2. LOCATION(CITY,STATE): **Hailey, ID**	3. LOC ID: **SUN**
4. EFFECTED RUNWAY/TAXIWAY: **RUNWAY 13-31** **TAXIWAY B**	5. APPROACH (EACH RUNWAY): **RW 13 VISUAL** **RW 31 NPI**	6. AIRPORT REF. CODE (ARC): **C-III**

7. DESIGN AIRCRAFT (EACH RUNWAY/TAXIWAY): **Bombardier Q-400 and Gulfstream G-V**

MODIFICATION OF STANDARDS

8. TITLE OF STANDARD BEING MODIFIED (CITE REFERENCE DOCUMENT):

Runway to Parallel Taxiway Separation, Advisory Circular 150/5300-13A, *Airport Design* (AC 150/5300-13A)

9. STANDARD/REQUIREMENT:

400 feet, per Table 3-8 on page 94 of AC 5300-13A.

10. PROPOSED:

320 feet.

11. EXPLAIN WHY STANDARD CANNOT BE MET (FAA ORDER 5300.1E):

In the airport's current configuration, relocation of Parallel Taxiway B to a separation of 400 feet would either require relocating the runway, adjacent Highway 75 and other facilities to the east or relocating all existing airport facilities to the west. Neither of these options are seen as practicable and providing a less than standard Runway to Parallel Taxiway Separation will provide an acceptable level of safety, based on the aircraft traffic at the airport.

12. DISCUSS VIABLE ALTERNATIVES (FAA ORDER 5300.1E):

The airport sponsor has considered three alternatives to improve Runway To Parallel Taxiway Separation at the airport. The first two alternatives, though viable, are not practicable, due to cost and environmental impact.

1. Relocate Runway And All Airport Facilities To The West – Not Practicable
    - Essentially reconstructs the entire airport west of existing facilities, including the terminal, FBO facilities, all hangars and maintenance/ARFF facilities.
    - Total estimated cost exceeds $144 million.
2. Relocate Runway and Highway to the East – Not Practicable
    - Requires relocation of approximately 2 miles of State Highway 75 to the east.
    - Requires acquisition of over 100 homes to accommodate relocated highway.
    - Idaho Transportation Department has completed an Environmental Impact Statement study for a proposed project on this highway, which identifies the following environmental impacts of the highway in this location, all of which would be exacerbated significantly by relocating the highway as described. Note that an environmental analysis for the proposed action relative to the airport has not been completed – these impacts are identified based on previous studies and would require further evaluation.
        - Historical Resources: Relocation of the highway would require removal of a railroad berm that has been identified as a potential historic structure.
        - Noise: The noise levels of a relocated highway may exceed those permitted by Federal Highway Administration guidelines and require mitigation. Mitigation is difficult at this location, due to local ordinances prohibiting construction of noise walls.
        - Environmental Justice: The adjacent neighborhood is high density, with relatively low incomes and a high minority population. Based on these factors, relocating the highway could induce environmental justice impacts.
    - Costs for this alternative are estimated to exceed $115 million.
3. Relocate Taxiway B to 320-feet Separation From Runway 13-31
    - Requires reconstruction of Taxiway B.
    - Requires relocation of several hangars and terminal parking apron to accommodate aircraft parking and maneuvering.
    - Based on existing traffic at the airport, this will provide an acceptable level of safety. (See explanation below.)

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION
NORTHWEST MOUNTAIN REGION
AIRPORT IMPROVEMENT PROGRAM

MODIFICATION OF AIRPORT DESIGN STANDARDS

13. STATE WHY MODIFICATION WOULD PROVIDE ACCEPTABLE LEVEL OF SAFETY, ECONOMY, DURABILITY, AND WORKMANSHIP (FAA ORDER 5300.1E):

Runway to Parallel Taxiway separation serves two purposes; the first is to prevent an aircraft on the taxiway from colliding with an aircraft that departs the runway surface during landing or takeoff and the second is to prevent an aircraft executing a missed approach from colliding with an aircraft on the taxiway. In 2011, the Transportation Research Board (TRB) published ACRP 51 – Risk Assessment Method to Support Modification of Airfield Separation Standards. This report provides a method for calculating the probability and associated risk for various runway to parallel taxiway separations. The method outlined in the report involves calculating the risk for three separate phases of aircraft operation: airborne phase, landing roll and takeoff roll. The highest risk value is then used to evaluate whether the less than standard separation is acceptable. The report provides figures for each of the phases of aircraft operations where the runway to taxiway separation is used to determine the risk.

Current traffic at SUN includes less than 50,000 operations (25,000 takeoffs and 25,000 landings) per year. Using these operational numbers and the procedure outlined in ACRP Report 51, the estimated risk along with the return period for each phase of operation is summarized below.

Airborne Phase – 8.4E-10 (one chance in 1.2 billion landings or once every 47,620 years)
Landing Roll – 9.0E-08 (one chance in 11 million landings or once every 440 years)
Takeoff Roll – 2.5E-08 (one chance in 40 million landings or once every 1,600 years)

The risk of collision during the landing roll is the controlling factor. Using the FAA's risk matrix, a severity level of catastrophic was assigned to the landing roll phase for this type of incident. Using the FAA likelihood levels, the acceptable level of risk associated with a catastrophic event is extremely improbable or less than once every 100 years. As shown above, the expected rate of occurrence is once every 440 years. A Runway to Parallel Taxiway Separation of 320' appears to provide an acceptable level of risk. In addition a separation of 320' would keep any part of an aircraft on the taxiway from penetrating the RSA, the Runway Obstacle Free Zone (OFZ) and the Part 77 Primary Surface.

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION
NORTHWEST MOUNTAIN REGION
AIRPORT IMPROVEMENT PROGRAM

MODIFICATION OF AIRPORT DESIGN STANDARDS

MODIFICATION:	LOCATION:	PAGE 2 OF 2
14. SIGNATURE OF ORIGINATOR:	15. ORIGINATOR'S ORGANIZATION:	16. TELEPHONE:
17. DATE OF LATEST FAA SIGNED ALP:		
18. ADO RECOMMENDATION:	19. SIGNATURE:	20. DATE:
21. FAA DIVISIONAL REVIEW (AT, AF, FS):		

ROUTING SYMBOL	SIGNATURE	DATE	CONCUR	NON-CONCUR

COMMENTS:

22. AIRPORTS' DIVISION FINAL ACTION:

☐ UNCONDITIONAL APPROVAL	☐ CONDITIONAL APPROVAL	☐ DISAPPROVAL

DATE:	SIGNATURE:	TITLE:

CONDITIONS OF APPROVAL:

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION
NORTHWEST MOUNTAIN REGION
AIRPORT IMPROVEMENT PROGRAM

MODIFICATION OF AIRPORT DESIGN STANDARDS

ITEMS 1-17 ARE TO BE COMPLETED BY THE AIRPORT SPONSOR(ORIGINATOR). ALL OTHER ITEMS WILL BE COMPLETED BY THE FAA.

THE COMPLETED FORM WILL BE TRANSMITTED BY THE ORIGINATOR TO THE APPLICABLE ADO/AFO. THE ADO/AFO WILL TRANSMIT THE FINAL FAA DETERMINATION TO THE ORIGINATOR.

MODIFICATION TO AIRPORT DESIGN STANDARDS REQUESTS SHOULD INCLUDE SKETCHES OR DRAWINGS WHICH CLEARLY ILLUSTRATE THE NONSTANDARD CONDITION.

ITEMS

1. LEGAL NAME OF AIRPORT.

2. ASSOCIATED CITY.

3. AIRPORT LOCATION IDENTIFIER (SEE APPROACH PLATES/AIRPORT FACILITY DIRECTORY).

4. IDENTIFY THE RUNWAY(S), TAXIWAY(S) OR OTHER FACILITIES EFFECTED BY THE PROPOSED MODIFICATION TO STANDARDS REQUEST.

5. IDENTIFY THE MOST CRITICAL APPROACH FOR EACH RUNWAY IDENTIFIED IN #4.

6. AIRPORT REFERENCE CODE - SEE PARAGRAPH 2, PAGE 1 AC 150/5300-13(CHANGE 4) - I.E. C-II, B-II, A-I (SMALL).

7. NOTE THE DESIGN AIRCRAFT (ARC OR SPECIFIC AIRCRAFT) FOR EACH FACILITY IDENTIFIED IN #4. A DESIGN AIRCRAFT MUST MAKE REGULAR USE OF THE FACILITY. NORMALLY, FAA CONSIDERS REGULAR USE TO BE 500 OR MORE ANNUAL INTINERANT OPERATIONS.

IF THE AIRPORT SERVES A WHOLE FAMILY OF AIRCRAFT IN A PARTICULAR GROUP, THE ARC (I.E. B-II) SHOULD BE SPECIFIED. IF,HOWEVER, THE AIRPORT IS USED BY ONLY 1 OR 2 OF A FAMILY OF AIRCRAFT (IX- BEECH KING AIR C90), THE MOST DEMANDING (APPROACH SPEED, WINGSPAN) AIRCRAFT SHOULD BE SPECIFIED.

8. IDENTIFY THE SPECIFIC NAME OF THE STANDARD THAT IS PROPOSED TO BE MODIFIED FOR THE SUBJECT LOCAL CONDITION.
9. DESCRIBE (WORDS AND NUMBERS) THE DIMENSIONS AND REQUIREMENTS OF THE STANDARD AS PROVIDED IN AC 150/5300-13.

10. STATE THE PROPOSED MODIFICATION TO THE STANDARD.

11. DISCUSS THE LOCAL CONDITIONS THAT MAKE IT IMPRACTICAL OR IMPOSSIBLE TO MEET THE STANDARD.

12. IDENTIFY ALTERNATIVES TO THE SUBJECT PROPOSED MODIFICATION, AND SHOW WHY THESE ALTERNATIVES ARE NOT VIABLE.

13. DISCUSS HOW THE PROPOSED MODIFICATION WOULD IMPACT AIRPORT SAFETY AND EXPLAIN WHY AN ACCEPTABLE LEVEL OF SAFETY, ECONOMY, DURABILITY, AND WORKMANSHIP WOULD STILL EXIST.

14. TYPED NAME AND SIGINATURE OF AIRPORT AUTHORITY REPRESELNTATIVE.

15. SELF-EXPLANATORY.

16. SELF-EXPLANATORY.

17. SELF-EXPLANATORY.

18. TO BE COMPLETED BY FAA.

Appendix 3

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION
AIRPORT IMPROVEMENT PROGRAM

MODIFICATION OF AIRPORT CONSTRUCTION STANDARDS

SPECIFICATION & PARA. REQUESTED MODIFICATION & JUSTIFICATION

DATE **SPONSOR**

DATE **APPROVED BY (FAA)**

Attachment A

APPENDIX D - MOS
TAXIWAY OFA

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION
NORTHWEST MOUNTAIN REGION
AIRPORT IMPROVEMENT PROGRAM

MODIFICATION OF AIRPORT DESIGN STANDARDS

BACKGROUND

1. AIRPORT: **Friedman Memorial Airport**	2. LOCATION(CITY,STATE): **Hailey, ID**	3. LOC ID: **SUN**
4. EFFECTED RUNWAY/TAXIWAY: **TAXIWAY B**	5. APPROACH (EACH RUNWAY): **RW 13 VISUAL** **RW 31 NPI**	6. AIRPORT REF. CODE (ARC): **C-III**

7. DESIGN AIRCRAFT (EACH RUNWAY/TAXIWAY): **Bombardier Q-400 and Gulfstream G-V**

MODIFICATION OF STANDARDS

8. TITLE OF STANDARD BEING MODIFIED (CITE REFERENCE DOCUMENT):

Parallel Taxiway Object Free Area (OFA), Advisory Circular 150/5300-13A, *Airport Design* (Advisory Circular 150/5300-13A)

9. STANDARD/REQUIREMENT:

186 feet per Table 4-1 on page 124 of AC 150/5300-13A.

10. PROPOSED:

160 feet.

11. EXPLAIN WHY STANDARD CANNOT BE MET (FAA ORDER 5300.1E):

In a separate modification request, the airport proposes relocating Taxiway B to 320 feet separation from Runway 13-31. In the airport's current configuration, relocation of Parallel Taxiway B to a separation of 320 feet with a full C-III Taxiway OFA of 186 feet would require significant modification to existing airport facilities, along with property acquisition and removal of adjacent buildings. This significant effort is not necessary, due to current and anticipated aircraft traffic at the airport.

12. DISCUSS VIABLE ALTERNATIVES (FAA ORDER 5300.1E):

The airport sponsors have considered two alternatives for Taxiway OFA on Taxiway B. Though both are viable, the first is not seen as practicable, due to the high costs and impacts, nor is it seen as necessary, due to the existing traffic at the airport.

1. Provide full C-III Taxiway OFA
    - Requires removal/relocation of 6 private hangars (1 of which is multi-unit condo hangars) on the north end of the airfield along with relocation of the FBO access at the south end of the airfield.
    - Several businesses northwest of the airport outside of the existing property boundary would need to be acquired and removed.
    - The estimated cost of removing the hangars and reconfiguring the FBO is at least $8.5 million. The estimated cost of acquiring the land northwest of the airport is $2.5 million, for a total cost in excess of $11 million.
2. Reduce Taxiway OFA to 160 feet.
    - Provides acceptable level of safety for aircraft that currently use the airport.

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION
NORTHWEST MOUNTAIN REGION
AIRPORT IMPROVEMENT PROGRAM

MODIFICATION OF AIRPORT DESIGN STANDARDS

13. STATE WHY MODIFICATION WOULD PROVIDE ACCEPTABLE LEVEL OF SAFETY, ECONOMY, DURABILITY, AND WORKMANSHIP (FAA ORDER 5300.1E):

The published pavement strength for Runway 13-31 at SUN is 95,000 pounds. For the current fleet of all available aircraft, no aircraft with a maximum takeoff weight of 95,000 pounds or less has a wingspan of greater than 100 feet. Therefore, existing and anticipated aircraft traffic will include only aircraft with wingspans less than 100 feet.

Using equation #2 from Table 1 in Engineering Brief (EB) 78 and this maximum wingspan, an aircraft specific Taxiway OFA was calculated. Equation #2 from EB 78 gives the separation from centerline to an object as 0.7 x Wingspan + 10 feet. Using the 100' wingspan described above, this calculation results in a Taxiway OFA of 160 feet. For the aircraft that use the airport, this Taxiway OFA meets standards and therefore will provide an acceptable level of safety.

In addition, ACRP Report #51 provides the methodology for analyzing the risk of taxiway to object separations. Using the separation of 80' and Figure AA-10 in Appendix A of ACRP Report #51, provides a risk level of 2.5E-09 or one chance in 400 million operations. As the risk is one incident in every 400 million operations, the occurrence is calculated as 400 million divided by 50,000 operations per year which equates to one incident every 8,000 years. The Hazard Severity Classification for this type of operation would be major and the acceptable probability of occurrence is remote (1E-05) or less than once every 1-10 years. A Taxiway OFA of 160' appears to provide an acceptable level of safety especially when considering the current and future aircraft fleet.

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION
NORTHWEST MOUNTAIN REGION
AIRPORT IMPROVEMENT PROGRAM

MODIFICATION OF AIRPORT DESIGN STANDARDS

MODIFICATION:	LOCATION:	PAGE 2 OF 2
14. SIGNATURE OF ORIGINATOR:	15. ORIGINATOR'S ORGANIZATION:	16. TELEPHONE:
17. DATE OF LATEST FAA SIGNED ALP:		
18. ADO RECOMMENDATION:	19. SIGNATURE:	20. DATE:
21. FAA DIVISIONAL REVIEW (AT, AF, FS):		

ROUTING SYMBOL	SIGNATURE	DATE	CONCUR	NON-CONCUR

COMMENTS:

22. AIRPORTS' DIVISION FINAL ACTION:

☐ UNCONDITIONAL APPROVAL	☐ CONDITIONAL APPROVAL	☐ DISAPPROVAL

DATE:	SIGNATURE:	TITLE:

CONDITIONS OF APPROVAL:

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION
NORTHWEST MOUNTAIN REGION
AIRPORT IMPROVEMENT PROGRAM

MODIFICATION OF AIRPORT DESIGN STANDARDS

ITEMS 1-17 ARE TO BE COMPLETED BY THE AIRPORT SPONSOR(ORIGINATOR). ALL OTHER ITEMS WILL BE COMPLETED BY THE FAA.

THE COMPLETED FORM WILL BE TRANSMITTED BY THE ORIGINATOR TO THE APPLICABLE ADO/AFO. THE ADO/AFO WILL TRANSMIT THE FINAL FAA DETERMINATION TO THE ORIGINATOR.

MODIFICATION TO AIRPORT DESIGN STANDARDS REQUESTS SHOULD INCLUDE SKETCHES OR DRAWINGS WHICH CLEARLY ILLUSTRATE THE NONSTANDARD CONDITION.

ITEMS

1. LEGAL NAME OF AIRPORT.

2. ASSOCIATED CITY.

3. AIRPORT LOCATION IDENTIFIER (SEE APPROACH PLATES/AIRPORT FACILITY DIRECTORY).

4. IDENTIFY THE RUNWAY(S), TAXIWAY(S) OR OTHER FACILITIES EFFECTED BY THE PROPOSED MODIFICATION TO STANDARDS REQUEST.

5. IDENTIFY THE MOST CRITICAL APPROACH FOR EACH RUNWAY IDENTIFIED IN #4.

6. AIRPORT REFERENCE CODE - SEE PARAGRAPH 2, PAGE 1 AC 150/5300-13(CHANGE 4) - I.E. C-II, B-II, A-I (SMALL).

7. NOTE THE DESIGN AIRCRAFT (ARC OR SPECIFIC AIRCRAFT) FOR EACH FACILITY IDENTIFIED IN #4. A DESIGN AIRCRAFT MUST MAKE REGULAR USE OF THE FACILITY. NORMALLY, FAA CONSIDERS REGULAR USE TO BE 500 OR MORE ANNUAL INTINERANT OPERATIONS.

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8. IDENTIFY THE SPECIFIC NAME OF THE STANDARD THAT IS PROPOSED TO BE MODIFIED FOR THE SUBJECT LOCAL CONDITION.
9. DESCRIBE (WORDS AND NUMBERS) THE DIMENSIONS AND REQUIREMENTS OF THE STANDARD AS PROVIDED IN AC 150/5300-13.

10. STATE THE PROPOSED MODIFICATION TO THE STANDARD.

11. DISCUSS THE LOCAL CONDITIONS THAT MAKE IT IMPRACTICAL OR IMPOSSIBLE TO MEET THE STANDARD.

12. IDENTIFY ALTERNATIVES TO THE SUBJECT PROPOSED MODIFICATION, AND SHOW WHY THESE ALTERNATIVES ARE NOT VIABLE.

13. DISCUSS HOW THE PROPOSED MODIFICATION WOULD IMPACT AIRPORT SAFETY AND EXPLAIN WHY AN ACCEPTABLE LEVEL OF SAFETY, ECONOMY, DURABILITY, AND WORKMANSHIP WOULD STILL EXIST.

14. TYPED NAME AND SIGINATURE OF AIRPORT AUTHORITY REPRESELNTATIVE.

15. SELF-EXPLANATORY.

16. SELF-EXPLANATORY.

17. SELF-EXPLANATORY.

18. TO BE COMPLETED BY FAA.

Appendix 3

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION
AIRPORT IMPROVEMENT PROGRAM

MODIFICATION OF AIRPORT CONSTRUCTION STANDARDS

SPECIFICATION & PARA. REQUESTED MODIFICATION & JUSTIFICATION

DATE **SPONSOR**

DATE **APPROVED BY (FAA)**

Attachment A

APPENDIX D - MOS
RUNWAY OFA GRADING

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION
NORTHWEST MOUNTAIN REGION
AIRPORT IMPROVEMENT PROGRAM

MODIFICATION OF AIRPORT DESIGN STANDARDS

BACKGROUND

1. AIRPORT: **Friedman Memorial Airport**	2. LOCATION(CITY,STATE): **Hailey, ID**	3. LOC ID: **SUN**
4. EFFECTED RUNWAY/TAXIWAY: **RUNWAY 13-31**	5. APPROACH (EACH RUNWAY): **RW 13 VISUAL** **RW 31 NPI**	6. AIRPORT REF. CODE (ARC): **C-III**

7. DESIGN AIRCRAFT (EACH RUNWAY/TAXIWAY): **Bombardier Q-400 and Gulfstream G-V**

MODIFICATION OF STANDARDS

8. TITLE OF STANDARD BEING MODIFIED (CITE REFERENCE DOCUMENT):

Runway Object Free Area (OFA), Advisory Circular 150/5300-13A, *Airport Design* (AC 150/5300-13A)

9. STANDARD/REQUIREMENT:

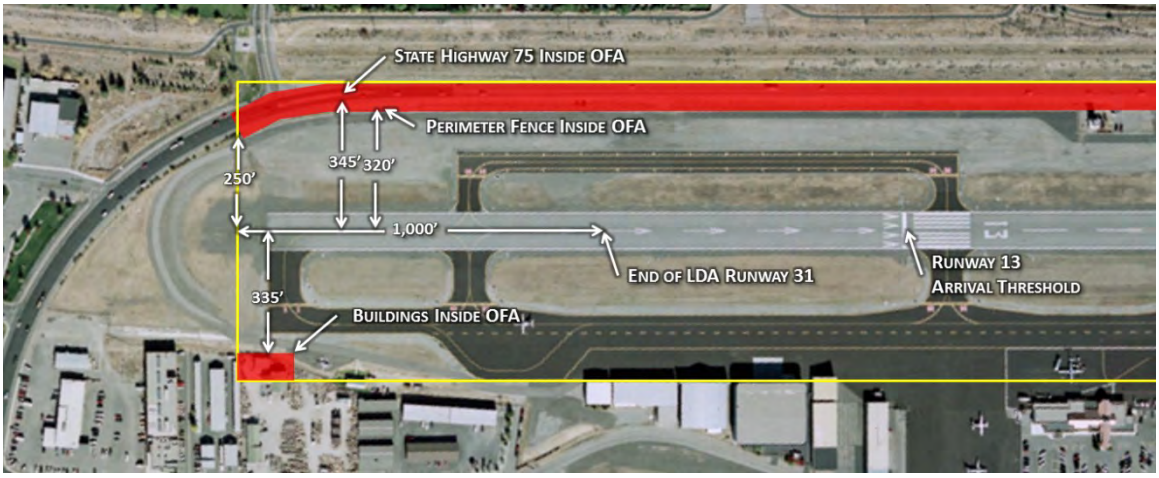
800 feet (400 foot either side of centerline) per Table 3-8 on page 94 of AC 150/5300-13A.

10. PROPOSED:

Varies see below.

11. EXPLAIN WHY STANDARD CANNOT BE MET (FAA ORDER 5300.1E):

State Highway 75 and the Perimeter Fence run parallel to Runway 13-31 from south to north until approximately 210' from the Runway 13 pavement end at which point they curve toward the runway until they are a minimum distance of 250' for the Perimeter Fence and 275' for State Highway 75 from the extended runway centerline. The following figure shows the deficiencies on the north end of the airfield in more detail:



As SUN is currently configured using declared distances, the OFA for arrivals and departures in each direction have different deficiencies. The OFA to the east of Runway 13-31 for both arrivals and departures is penetrated by both State Highway 75 and the Perimeter Fence at 345' and 320' respectively. The OFA for Runway 13 departures and Runway 31 arrivals are penetrated to a greater degree at the north end of the airfield by the Perimeter Fence and State Highway 75 along with two buildings located off airport property. The deficiencies are summarized in the following table:

Runway OFA	State Highway 75	Perimeter Fence	Off Airport Buildings
13 Arrivals	345'	320'	None
13 Departures	275' to 345'	250' to 320'	335'
31 Arrivals	275' to 345'	250' to 320'	335'
31 Departures	345'	320'	None

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION
NORTHWEST MOUNTAIN REGION
AIRPORT IMPROVEMENT PROGRAM

MODIFICATION OF AIRPORT DESIGN STANDARDS

In order to meet OFA requirements either the Runway and all airport facilities would have to be shifted to the West or State Highway 75 would have to be shifted to the East.

Neither of these options are seen as practicable and providing a less than standard OFA will provide an acceptable level of safety, based on the aircraft traffic at the airport.

12. DISCUSS VIABLE ALTERNATIVES (FAA ORDER 5300.1E):

The airport sponsor has considered three alternatives to provide a Runway OFA at the airport that complies with standards. The first two alternatives, though viable, are not practicable, due to cost and environmental impact.

1. Relocate Runway And All Airport Facilities To The West – Not Practicable
    - Essentially reconstructs the entire airport west of existing facilities, including the terminal, FBO facilities, all hangars and maintenance/ARFF facilities.
    - Total estimated cost exceeds $144 million.
2. Relocate Highway to the East – Not Practicable
    - Requires relocation of approximately 2 miles of State Highway 75 approximately 75 feet to the east.
    - A large neighborhood exists east of the airport in this location and relocating the highway will greatly increase the environmental impact of the highway on that neighborhood. Idaho Transportation Department has completed an Environmental Impact Statement study for a proposed project on this highway, which identifies the following environmental impacts of the highway in this location, all of which would be exacerbated significantly by relocating the highway as described. Note that an environmental analysis for the proposed action relative to the airport has not been completed – these impacts are identified based on previous studies and would require further evaluation.
        - Historical Resources: Relocation of the highway would require removal of a railroad berm that has been identified as a potential historic structure.
        - Noise: The noise levels of a relocated highway may exceed those permitted by Federal Highway Administration guidelines and require mitigation. Mitigation is difficult at this location, due to local ordinances prohibiting construction of noise walls.
        - Environmental Justice: The adjacent neighborhood is high density, with relatively low incomes and a high minority population. Based on these factors, relocating the highway could induce environmental justice impacts.
    - Costs for relocating the highway are estimated to exceed $17 million.
3. Allow Highway, Fence and Buildings To Remain
    - Do not relocate the highway.
    - Based on existing traffic at the airport, this will provide an acceptable level of safety. (See explanation below.)

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION
NORTHWEST MOUNTAIN REGION
AIRPORT IMPROVEMENT PROGRAM

MODIFICATION OF AIRPORT DESIGN STANDARDS

13. STATE WHY MODIFICATION WOULD PROVIDE ACCEPTABLE LEVEL OF SAFETY, ECONOMY, DURABILITY, AND WORKMANSHIP (FAA ORDER 5300.1E):

In 2011, the Transportation Research Board (TRB) published ACRP Report 51 – Risk Assessment Method to Support Modification of Airfield Separation Standards. This report provides a method for calculating the probability and associated risk for various runway to object separations, with the purpose of determining acceptability of modifications of standards. The method outlined in the report involves calculating the risk for three separate phases of aircraft operation: airborne phase, landing roll and takeoff roll. The highest risk value is then used to evaluate whether the separation is acceptable. The report provides figures for each of the phases of aircraft operations where the runway to object separation is used to determine the risk.

Current traffic at SUN includes less than 50,000 operations (25,000 takeoffs and 25,000 landings) per year. Using these operational numbers and the procedure outlined in ACRP Report 51, the estimated risk along with the return period for each phase of operation is summarized below for each of the objects located in the Runway Object Free Area. In each case, the controlling phase of flight was the Landing Roll. The table below summarizes the risk associated with each object.

Object (Separation)	Controlling Phase of Flight	Hazard Severity Classification	Rate of Occurrence	Acceptable Level?
Perimeter Fence (250')	Landing Roll	Major	Once every 250 years	Yes
Perimeter Fence (320')	Landing Roll	Major	Once every 440 years	Yes
State Highway 75 (275')	Landing Roll	Catastrophic	Once every 333 years	Yes
State Highway 75 (345')	Landing Roll	Catastrophic	Once every 571 years	Yes
Off Airport Buildings (335')	Landing Roll	Catastrophic	Once every 500 years	Yes

As shown in the table above, each of the various Runway to Object Separations provide an acceptable level of risk. In addition, the closest separations are all located on the north end of the airfield. Though each of these penetrates the departure OFA for Runway 13, the risk of an incident is actually much lower as an aircraft would be taking off in the opposite direction of the objects. For arrivals on Runway 31, due to the use of declared distances, the objects are located a minimum of 1,000' from the end of the runway declared suitable for landing operations. Their location is modeled as if the objects are located laterally to the runway and as such the actual risk of an incident is much lower.

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION
NORTHWEST MOUNTAIN REGION
AIRPORT IMPROVEMENT PROGRAM

MODIFICATION OF AIRPORT DESIGN STANDARDS

MODIFICATION:	LOCATION:	PAGE 2 OF 2
14. SIGNATURE OF ORIGINATOR:	15. ORIGINATOR'S ORGANIZATION:	16. TELEPHONE:
17. DATE OF LATEST FAA SIGNED ALP:		
18. ADO RECOMMENDATION:	19. SIGNATURE:	20. DATE:
21. FAA DIVISIONAL REVIEW (AT, AF, FS):		

ROUTING SYMBOL	SIGNATURE	DATE	CONCUR	NON-CONCUR

COMMENTS:

22. AIRPORTS' DIVISION FINAL ACTION:

☐ UNCONDITIONAL APPROVAL	☐ CONDITIONAL APPROVAL	☐ DISAPPROVAL

DATE:	SIGNATURE:	TITLE:

CONDITIONS OF APPROVAL:

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION
NORTHWEST MOUNTAIN REGION
AIRPORT IMPROVEMENT PROGRAM

MODIFICATION OF AIRPORT DESIGN STANDARDS

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MODIFICATION TO AIRPORT DESIGN STANDARDS REQUESTS SHOULD INCLUDE SKETCHES OR DRAWINGS WHICH CLEARLY ILLUSTRATE THE NONSTANDARD CONDITION.

ITEMS

1. LEGAL NAME OF AIRPORT.

2. ASSOCIATED CITY.

3. AIRPORT LOCATION IDENTIFIER (SEE APPROACH PLATES/AIRPORT FACILITY DIRECTORY).

4. IDENTIFY THE RUNWAY(S), TAXIWAY(S) OR OTHER FACILITIES EFFECTED BY THE PROPOSED MODIFICATION TO STANDARDS REQUEST.

5. IDENTIFY THE MOST CRITICAL APPROACH FOR EACH RUNWAY IDENTIFIED IN #4.

6. AIRPORT REFERENCE CODE - SEE PARAGRAPH 2, PAGE 1 AC 150/5300-13(CHANGE 4) - I.E. C-II, B-II, A-I (SMALL).

7. NOTE THE DESIGN AIRCRAFT (ARC OR SPECIFIC AIRCRAFT) FOR EACH FACILITY IDENTIFIED IN #4. A DESIGN AIRCRAFT MUST MAKE REGULAR USE OF THE FACILITY. NORMALLY, FAA CONSIDERS REGULAR USE TO BE 500 OR MORE ANNUAL INTINERANT OPERATIONS.

IF THE AIRPORT SERVES A WHOLE FAMILY OF AIRCRAFT IN A PARTICULAR GROUP, THE ARC (I.E. B-II) SHOULD BE SPECIFIED. IF,HOWEVER, THE AIRPORT IS USED BY ONLY 1 OR 2 OF A FAMILY OF AIRCRAFT (IX- BEECH KING AIR C90), THE MOST DEMANDING (APPROACH SPEED, WINGSPAN) AIRCRAFT SHOULD BE SPECIFIED.

8. IDENTIFY THE SPECIFIC NAME OF THE STANDARD THAT IS PROPOSED TO BE MODIFIED FOR THE SUBJECT LOCAL CONDITION.
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11. DISCUSS THE LOCAL CONDITIONS THAT MAKE IT IMPRACTICAL OR IMPOSSIBLE TO MEET THE STANDARD.

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15. SELF-EXPLANATORY.

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Appendix 3

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION
AIRPORT IMPROVEMENT PROGRAM

MODIFICATION OF AIRPORT CONSTRUCTION STANDARDS

SPECIFICATION & PARA. REQUESTED MODIFICATION & JUSTIFICATION

DATE **SPONSOR**

DATE **APPROVED BY (FAA)**

Attachment A

APPENDIX D - MOS
RSA GRADING

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION
NORTHWEST MOUNTAIN REGION
AIRPORT IMPROVEMENT PROGRAM

MODIFICATION OF AIRPORT DESIGN STANDARDS

BACKGROUND

1. AIRPORT: **Friedman Memorial Airport**	2. LOCATION(CITY,STATE): **Hailey, ID**	3. LOC ID: **SUN**
4. EFFECTED RUNWAY/TAXIWAY: **RUNWAY 13-31**	5. APPROACH (EACH RUNWAY): **RW 13 VISUAL** **RW 31 NPI**	6. AIRPORT REF. CODE (ARC): **C-III**

7. DESIGN AIRCRAFT (EACH RUNWAY/TAXIWAY): **Bombardier Q-400 and Gulfstream G-V**

MODIFICATION OF STANDARDS

8. TITLE OF STANDARD BEING MODIFIED (CITE REFERENCE DOCUMENT):

Runway Safety Area (RSA) Grading, Advisory Circular 150/5300-13A, *Airport Design* (AC 150/5300-13A)

9. STANDARD/REQUIREMENT:

Per Figure 3-23 on page 82 of AC 5300-13, the RSA transverse grades vary from 1.5% to 3% from the edge of runway shoulder down to the edge of the runway safety area.

10. PROPOSED:

Existing transverse grades in the north half of the airport vary from 0% to 1% to remain.

11. EXPLAIN WHY STANDARD CANNOT BE MET (FAA ORDER 5300.1E):

In order to meet the RSA grading standards, approximately 250,000 cubic yards of excavation would be disposed of offsite in addition to approximately 50,000 yards of onsite embankment. The estimated cost of disposing of the material offsite alone is over $3.7 million dollars. In the mountain environment of Hailey, the project would need to occur in the summer during peak travel times and the airport's single runway would need to be shut down for approximately 90 days to complete the work. The closure of the airport for an extended period of time would have significant negative economic impacts on the community.

12. DISCUSS VIABLE ALTERNATIVES (FAA ORDER 5300.1E):

The airport sponsor has considered two alternatives to meet this standard. Though viable, the first alternative is not seen as practicable due to cost and operational impacts relative to the improvement in safety.

1. Grade the RSA so transverse grades are -1.5% to -3%.
    - Requires excavation of over 300,000 cubic yards of material, over 250,000 of which would need to be disposed of off site.
    - Additional cost of over $3.7 million to dispose of material off site.
    - Additional cost of $1.5 million to relocate storm drainage system.
    - Would require runway shut down of up to 90 days during summer months, with a huge negative impact to the airport and local economy.
2. Allow existing grades of 0% to +1% to remain.
    - Provides acceptable level of safety, as described below.
    - No operational or cost impacts.

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION
NORTHWEST MOUNTAIN REGION
AIRPORT IMPROVEMENT PROGRAM

MODIFICATION OF AIRPORT DESIGN STANDARDS

13. STATE WHY MODIFICATION WOULD PROVIDE ACCEPTABLE LEVEL OF SAFETY, ECONOMY, DURABILITY, AND WORKMANSHIP (FAA ORDER 5300.1E):

From AC 150/5300-13A, the purpose of the RSA is to *"enhance the safety of aircraft which undershoot, overrun or veer off the runway, and it provides greater accessibility for fire fighting and rescue equipment during such incidents."* The distance an aircraft departs from the runway is affected by three (3) major elements: weight of the aircraft, speed of the aircraft and RSA gradient. The third variable and the subject of this modification, the RSA gradient, affects the rate at which an aircraft slows after departing the runway. The steeper the gradient the longer it will take for an aircraft to stop. The existing transverse RSA gradients at SUN are flatter than standard; meaning an aircraft would actually come to a stop sooner if all other variables were equal. Paragraph 307 f in AC 5300-13 describes this condition: *"Keeping negative grades to the minimum practicable contributes to the effectiveness of the RSA."* Though flatter than standard, the RSA at SUN is graded smoothly and is capable of safely accommodating an aircraft without damage, in the case of a veer off.

The negative aspect of gradients flatter than standard are the inability to adequately drain the RSA during rainfall events. The existing RSA at SUN drains extremely well, with no accumulation of water. Existing soils drain very well and the local climate is dry, with an average annual rainfall of only 16 inches. In addition, the runway is equipped with a storm drainage system that collects and removes drainage efficiently.

The total estimated cost of meeting the minimum transverse grade of a 1.5% is $5 Million dollars and will require a full airport closure for 3 months. As the proposed RSA at SUN will meet the RSA requirements defined in AC 5300-13A, the grades flatter than standard will provide an acceptable level of safety.

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION
NORTHWEST MOUNTAIN REGION
AIRPORT IMPROVEMENT PROGRAM

MODIFICATION OF AIRPORT DESIGN STANDARDS

MODIFICATION:	LOCATION:	PAGE 2 OF 2
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ROUTING SYMBOL	SIGNATURE	DATE	CONCUR	NON-CONCUR

COMMENTS:

22. AIRPORTS' DIVISION FINAL ACTION:

☐ UNCONDITIONAL APPROVAL	☐ CONDITIONAL APPROVAL	☐ DISAPPROVAL

DATE:	SIGNATURE:	TITLE:

CONDITIONS OF APPROVAL:

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Appendix 3

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION
AIRPORT IMPROVEMENT PROGRAM

MODIFICATION OF AIRPORT CONSTRUCTION STANDARDS

SPECIFICATION & PARA. REQUESTED MODIFICATION & JUSTIFICATION

DATE **SPONSOR**

DATE **APPROVED BY (FAA)**

Attachment A

APPENDIX D - MOS
RUNWAY CENTERLINE TO AIRCRAFT PARKING

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION
NORTHWEST MOUNTAIN REGION
AIRPORT IMPROVEMENT PROGRAM

MODIFICATION OF AIRPORT DESIGN STANDARDS

BACKGROUND

1. AIRPORT: **Friedman Memorial Airport**	2. LOCATION(CITY,STATE): **Hailey, ID**	3. LOC ID: **SUN**
4. EFFECTED RUNWAY/TAXIWAY: **RUNWAY 13-31**	5. APPROACH (EACH RUNWAY): **RW 13 VISUAL** **RW 31 NPI**	6. AIRPORT REF. CODE (ARC): **C-III**

7. DESIGN AIRCRAFT (EACH RUNWAY/TAXIWAY): **Bombardier Q-400 and Gulfstream G-V**

MODIFICATION OF STANDARDS

8. TITLE OF STANDARD BEING MODIFIED (CITE REFERENCE DOCUMENT):

Runway to Aircraft Parking Area, Advisory Circular 150/5300-13A, *Airport Design* (Advisory Circular 150/5300-13A)

9. STANDARD/REQUIREMENT:

500 feet per Table 3-8 on page 94 of AC 150/5300-13A.

10. PROPOSED:

400 feet

11. EXPLAIN WHY STANDARD CANNOT BE MET (FAA ORDER 5300.1E):

In the airport's current configuration, relocation of aircraft parking area to a separation of 500 feet would either require the reconfiguration of all airfield facilities on the west side of the airport or relocating the runway and Highway 75 to the east to provide the required separation. Neither of these options are seen as practicable and providing a separation of 400 feet between Runway 13-31 and Aircraft Parking will provide an acceptable level of safety, based on the aircraft traffic at the airport.

12. DISCUSS VIABLE ALTERNATIVES (FAA ORDER 5300.1E):

The airport sponsor has considered three alternatives to provide meet or improve compliance with standards at the airport, including Runway to Aircraft Parking Separation. The first two alternatives, though viable, are not practicable, due to cost and environmental impact.

1. Relocate Terminal and Aircraft Parking To The Southwest – Not Necessary
    - Acquire 30 Acres of land, relocate terminal building and access road, extend utilties and construct 50,000 SY of aircraft parking
    - Total estimated cost exceeds $30 million.
2. Relocate Runway and Highway to the East – Not Practicable
    - Requires relocation of approximately 2 miles of State Highway 75 approximately 75 feet to the east.
    - A large neighborhood exists east of the airport in this location and relocating the highway will greatly increase the environmental impact of the highway on that neighborhood. Idaho Transportation Department has completed an Environmental Impact Statement study for a proposed project on this highway, which identifies the following environmental impacts of the highway in this location, all of which would be exacerbated significantly by relocating the highway as described. Note that an environmental analysis for the proposed action relative to the airport has not been completed – these impacts are identified based on previous studies and would require further evaluation.
        - Historical Resources: Relocation of the highway would require removal of a railroad berm that has been identified as a potential historic structure.
        - Noise: The noise levels of a relocated highway may exceed those permitted by Federal Highway Administration guidelines and require mitigation. Mitigation is difficult at this location, due to local ordinances prohibiting construction of noise walls.
        - Environmental Justice: The adjacent neighborhood is high density, with relatively low incomes and a high minority population. Based on these factors, relocating the highway could induce environmental justice impacts.
    - Costs for relocating the Runway and Highway are estimated to exceed $119 million.
3. Reconfigure Aircraft Parking to Provide 400 Feet Separation
    - Can be accomplished along with other proposed standards improvements, without additional cost or environmental impact.
    - Provides acceptable level of safety.

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION
NORTHWEST MOUNTAIN REGION
AIRPORT IMPROVEMENT PROGRAM

MODIFICATION OF AIRPORT DESIGN STANDARDS

13. STATE WHY MODIFICATION WOULD PROVIDE ACCEPTABLE LEVEL OF SAFETY, ECONOMY, DURABILITY, AND WORKMANSHIP (FAA ORDER 5300.1E):

According to AC 150/5300-13A Paragraph 321 a (3), "Runway to aircraft parking area separation is determined by the landing and takeoff flight path profiles and physical characteristics of the aircraft. The runway to parking area separation standard precludes any part of a parked aircraft (tail, wingtip, nose, etc.) from being within the ROFA or penetrating the OFZ."

A runway to aircraft parking area separation of 400 feet would preclude any part of a parked aircraft from penetrating the Runway OFA or the Runway OFZ. In addition, a separation of 400 feet would also provide the following benefits:

1. Prevent parked aircraft from penetrating the Runway Primary Surface
2. Prevent parked aircraft from penetrating the Runway Transitional Surface
3. Prevent parked aircraft from penetrating the Taxiway OFA

As the proposed runway to aircraft parking area separation of 400 feet meets the purpose of this standard as stated in AC 150/5300-13A, this configuration will provide an acceptable level of safety.

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION
NORTHWEST MOUNTAIN REGION
AIRPORT IMPROVEMENT PROGRAM

MODIFICATION OF AIRPORT DESIGN STANDARDS

MODIFICATION:	LOCATION:	PAGE 2 OF 2
14. SIGNATURE OF ORIGINATOR:	15. ORIGINATOR'S ORGANIZATION:	16. TELEPHONE:
17. DATE OF LATEST FAA SIGNED ALP:		
18. ADO RECOMMENDATION:	19. SIGNATURE:	20. DATE:
21. FAA DIVISIONAL REVIEW (AT, AF, FS):		

ROUTING SYMBOL	SIGNATURE	DATE	CONCUR	NON-CONCUR

COMMENTS:

22. AIRPORTS' DIVISION FINAL ACTION:

☐ UNCONDITIONAL APPROVAL	☐ CONDITIONAL APPROVAL	☐ DISAPPROVAL

DATE:	SIGNATURE:	TITLE:

CONDITIONS OF APPROVAL:

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION
NORTHWEST MOUNTAIN REGION
AIRPORT IMPROVEMENT PROGRAM

MODIFICATION OF AIRPORT DESIGN STANDARDS

ITEMS 1-17 ARE TO BE COMPLETED BY THE AIRPORT SPONSOR(ORIGINATOR). ALL OTHER ITEMS WILL BE COMPLETED BY THE FAA.

THE COMPLETED FORM WILL BE TRANSMITTED BY THE ORIGINATOR TO THE APPLICABLE ADO/AFO. THE ADO/AFO WILL TRANSMIT THE FINAL FAA DETERMINATION TO THE ORIGINATOR.

MODIFICATION TO AIRPORT DESIGN STANDARDS REQUESTS SHOULD INCLUDE SKETCHES OR DRAWINGS WHICH CLEARLY ILLUSTRATE THE NONSTANDARD CONDITION.

ITEMS

1. LEGAL NAME OF AIRPORT.

2. ASSOCIATED CITY.

3. AIRPORT LOCATION IDENTIFIER (SEE APPROACH PLATES/AIRPORT FACILITY DIRECTORY).

4. IDENTIFY THE RUNWAY(S), TAXIWAY(S) OR OTHER FACILITIES EFFECTED BY THE PROPOSED MODIFICATION TO STANDARDS REQUEST.

5. IDENTIFY THE MOST CRITICAL APPROACH FOR EACH RUNWAY IDENTIFIED IN #4.

6. AIRPORT REFERENCE CODE - SEE PARAGRAPH 2, PAGE 1 AC 150/5300-13(CHANGE 4) - I.E. C-II, B-II, A-I (SMALL).

7. NOTE THE DESIGN AIRCRAFT (ARC OR SPECIFIC AIRCRAFT) FOR EACH FACILITY IDENTIFIED IN #4. A DESIGN AIRCRAFT MUST MAKE REGULAR USE OF THE FACILITY. NORMALLY, FAA CONSIDERS REGULAR USE TO BE 500 OR MORE ANNUAL INTINERANT OPERATIONS.

IF THE AIRPORT SERVES A WHOLE FAMILY OF AIRCRAFT IN A PARTICULAR GROUP, THE ARC (I.E. B-II) SHOULD BE SPECIFIED. IF,HOWEVER, THE AIRPORT IS USED BY ONLY 1 OR 2 OF A FAMILY OF AIRCRAFT (IX- BEECH KING AIR C90), THE MOST DEMANDING (APPROACH SPEED, WINGSPAN) AIRCRAFT SHOULD BE SPECIFIED.

8. IDENTIFY THE SPECIFIC NAME OF THE STANDARD THAT IS PROPOSED TO BE MODIFIED FOR THE SUBJECT LOCAL CONDITION.
9. DESCRIBE (WORDS AND NUMBERS) THE DIMENSIONS AND REQUIREMENTS OF THE STANDARD AS PROVIDED IN AC 150/5300-13.

10. STATE THE PROPOSED MODIFICATION TO THE STANDARD.

11. DISCUSS THE LOCAL CONDITIONS THAT MAKE IT IMPRACTICAL OR IMPOSSIBLE TO MEET THE STANDARD.

12. IDENTIFY ALTERNATIVES TO THE SUBJECT PROPOSED MODIFICATION, AND SHOW WHY THESE ALTERNATIVES ARE NOT VIABLE.

13. DISCUSS HOW THE PROPOSED MODIFICATION WOULD IMPACT AIRPORT SAFETY AND EXPLAIN WHY AN ACCEPTABLE LEVEL OF SAFETY, ECONOMY, DURABILITY, AND WORKMANSHIP WOULD STILL EXIST.

14. TYPED NAME AND SIGINATURE OF AIRPORT AUTHORITY REPRESELNTATIVE.

15. SELF-EXPLANATORY.

16. SELF-EXPLANATORY.

17. SELF-EXPLANATORY.

18. TO BE COMPLETED BY FAA.

Appendix 3

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION
AIRPORT IMPROVEMENT PROGRAM

MODIFICATION OF AIRPORT CONSTRUCTION STANDARDS

SPECIFICATION & PARA. REQUESTED MODIFICATION & JUSTIFICATION

DATE **SPONSOR**

DATE **APPROVED BY (FAA)**

Attachment A

ACRP

REPORT 51

AIRPORT COOPERATIVE RESEARCH PROGRAM

Sponsored by the Federal Aviation Administration

Risk Assessment Method to Support Modification of Airfield Separation Standards

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AIRPORT COOPERATIVE RESEARCH PROGRAM

ACRP REPORT 51

Risk Assessment Method to Support Modification of Airfield Separation Standards

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AIRPORT COOPERATIVE RESEARCH PROGRAM

Airports are vital national resources. They serve a key role in transportation of people and goods and in regional, national, and international commerce. They are where the nation's aviation system connects with other modes of transportation and where federal responsibility for managing and regulating air traffic operations intersects with the role of state and local governments that own and operate most airports. Research is necessary to solve common operating problems, to adapt appropriate new technologies from other industries, and to introduce innovations into the airport industry. The Airport Cooperative Research Program (ACRP) serves as one of the principal means by which the airport industry can develop innovative near-term solutions to meet demands placed on it.

The need for ACRP was identified in *TRB Special Report 272: Airport Research Needs: Cooperative Solutions* in 2003, based on a study sponsored by the Federal Aviation Administration (FAA). The ACRP carries out applied research on problems that are shared by airport operating agencies and are not being adequately addressed by existing federal research programs. It is modeled after the successful National Cooperative Highway Research Program and Transit Cooperative Research Program. The ACRP undertakes research and other technical activities in a variety of airport subject areas, including design, construction, maintenance, operations, safety, security, policy, planning, human resources, and administration. The ACRP provides a forum where airport operators can cooperatively address common operational problems.

The ACRP was authorized in December 2003 as part of the Vision 100-Century of Aviation Reauthorization Act. The primary participants in the ACRP are (1) an independent governing board, the ACRP Oversight Committee (AOC), appointed by the Secretary of the U.S. Department of Transportation with representation from airport operating agencies, other stakeholders, and relevant industry organizations such as the Airports Council International-North America (ACI-NA), the American Association of Airport Executives (AAAE), the National Association of State Aviation Officials (NASAO), and the Air Transport Association (ATA) as vital links to the airport community; (2) the TRB as program manager and secretariat for the governing board; and (3) the FAA as program sponsor. In October 2005, the FAA executed a contract with the National Academies formally initiating the program.

The ACRP benefits from the cooperation and participation of airport professionals, air carriers, shippers, state and local government officials, equipment and service suppliers, other airport users, and research organizations. Each of these participants has different interests and responsibilities, and each is an integral part of this cooperative research effort.

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ACRP REPORT 51

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FOREWORD

By Marci A. Greenberger
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ACRP Report 51: Risk Assessment Method to Support Modification of Airfield Separation Standards provides a methodology that airports can use to support their request for modification of standards. It is intended to be used in those circumstances where the design criteria for separations between taxiways/taxilanes and (1) other taxiways/taxilanes and (2) fixed or movable objects as well as separations between taxiways and runways cannot be met. This risk-based methodology will be useful to airport staff and their consultants as they assess the risks associated with non-standard separations at existing constrained airports where the standards can't be practicably met.

To ensure safe operations, FAA-specified airfield design criteria include standards between runways and taxiways and other movement areas and fixed and moveable objects. As many airports were designed long before current design standards and as airplane design and operational realities have changed, so have the impacts that the separation standards can have on existing airfield operations. To account for these realities, the FAA does accept requests from airports for modification of standards.

As risk assessments become more and more a part of any decision-making criteria in many if not all aspects of airport operations and management, it is timely then that this risk-based methodology for assessing and justifying requests to modify separation standards has been developed. Applied Research Associates, Inc. (ARA) was retained under ACRP Project 04-09 to develop a method for assessing the risks associated with non-standard separations. The result of their efforts is *ACRP Report 51: Risk Assessment Method to Support Modification of Airfield Separation Standards*. The methodology was developed in part by analyzing data associated with aircraft veering from runway and taxiway centerlines and determining the probability of incidents occurring. ARA validated their methodology by examining actual modification of standards cases that were approved by the FAA.

Three of the report's appendices will be particularly helpful to the user in understanding the methodology. Appendix A: Risk Assessment Methodology presents a methodology for five different types of circumstances: taxiway/taxilane to taxiway, taxiway to object, taxilane to taxilane, taxilane to an object, and runway to taxiway/taxilane or object. Appendix F: Aircraft Database Summary presents a summary of aircraft characteristics by model, and Appendix H: Analysis of MOS Cases summarizes information collected in the modification of standards survey and presents results of application of the methodology described in Appendix A to each modification of standards case. Other report appendices provide detail and information on the development of the methodology and are provided on the TRB website at http://www.trb.org/Main/Blurbs/165180.aspx. Posted at the same URL on the TRB website is a PowerPoint presentation that may be useful for introducing and explaining the methodology to stakeholders.

CONTENTS

1 Summary

2 **Chapter 1** Background
2 Introduction
2 Project Goals
2 Major Challenges Associated with Airfield Separations
3 FAA Modification of Standards

4 **Chapter 2** Airfield Separation Rationale
4 FAA Rationale
8 ICAO Rationale

12 **Chapter 3** Data for Modeling Aircraft Deviations
12 Airfield Lateral Deviation Studies
12 Veer-Off Accidents and Incidents
13 Aircraft Veer-Off Database Organization
14 Normal Operations Data (NOD)
15 Aircraft Data

16 **Chapter 4** Methodology Approach
16 Taxiway and Taxilane Deviation Modeling
21 Runway Deviation Modeling

28 **Chapter 5** Validating the Methodology
28 MOS Case Studies
28 MOS Survey
28 Methodology Applied to MOS Cases

31 **Chapter 6** Conclusions and Recommendations
31 Major Achievements
32 Limitations
32 Recommendations for Future Work

34 Glossary of Acronyms

36 Definitions

37 References

A-1 **Appendix A** Risk Assessment Methodology

B-1 **Appendix B** Collision Risk Model

C-1 **Appendix C** Key Studies on Aircraft Deviation

D-1 **Appendix D** List of Veer-Off Accidents and Incidents

E-1 **Appendix E** Sample of Normal Operations Data

F-1 **Appendix F** Aircraft Database Summary
G-1 **Appendix G** Summary of FAA/Boeing Taxiway Deviation Studies
H-1 **Appendix H** Analysis of MOS Cases

Note: Many of the photographs, figures, and tables in this report have been converted from color to grayscale for printing. The electronic version of the report (posted on the Web at www.trb.org) retains the color versions.

SUMMARY

Risk Assessment Method to Support Modification of Airfield Separation Standards

The Federal Aviation Administration (FAA) sets standards for the planning and design of airports to provide safe aircraft operations. These design standards include separation distances between various airfield components such as runways and taxiways, taxiways and taxiways, and taxiways and objects.

Many U.S. airports were built according to older FAA design standards and were planned to accommodate smaller aircraft. With the rapid growth of aviation demand since World War II, many airports are facing the need to increase capacity and to accommodate larger and faster aircraft. However, some airports are finding it a challenge to modify existing airfield separations to meet current standards for larger aircraft because they are constrained by physical barriers, environmentally sensitive areas, and encroaching development.

When it is not feasible to meet existing separations, airports may submit to the FAA a request for modification of standards (MOS) to demonstrate that there are unique local conditions that restrict extending the airfield and to show that the modification will "provide an acceptable level of safety, economy, durability, and workmanship" (FAA, 1989). In requests for an MOS to a separation standard, the main concern is usually the safety of operations. As the FAA and the aviation industry transition to a safety management approach to improve safety, it is important that risks associated with changes be assessed.

Authorization for MOS may be granted if the MOS fulfills the criteria described in FAA's Advisory Circular (AC) 150/5300-13, Airport Design, which specifically addresses taxiway and taxilane separations (FAA, 1989). The criteria do not provide an assessment of risk that may be used for specific airfield scenarios, including the separation between runways and other airfield components (taxiways, taxilanes, and objects). Adherence to the FAA requirements can affect airport efficiency and capacity and, potentially, prevent certain aircraft from using an airfield.

The objective of this research effort was to develop a simple and practical methodology for assessing the risk of aircraft collisions associated with non-standard airfield separations. The tool developed is intended to support MOS requests for non-standard separations.

A practical, risk-based methodology to evaluate airfield separations was developed. The methodology is based on the probability of lateral and vertical deviations from the intended path during landing, takeoff, and taxiing operations. A series of risk plots based on centerline or wingtip separations is provided for each Aircraft Design Group (ADG), and step-by-step procedures are described for each type of separation involved in the analysis, such as runway and taxiway, and taxiway and taxiway.

The methodology was validated using actual MOS cases approved by the FAA that covered a spectrum of scenarios, airports, and FAA regions. Relevant information was gathered for each case to characterize the non-standard situation and was analyzed using the methodology developed in this study. Risk criteria were suggested based on the risk matrix used by the FAA in safety management systems, on the evidence of accident and incident rates, and the consequences gathered in this research effort.

CHAPTER 1

Background

Introduction

The modernization and complexity of the National Airspace System (NAS) have increased considerably in the last four decades, and its components require continuous improvements to increase capacity and safety. Airports are one of the main components of this complex and dynamic system.

To meet higher demands for flights, airlines are operating larger aircraft with greater seating capacity. However, the airfield configurations at many airports were established years ago, and many existing airports were designed and constructed in the 1960s and 1970s to accommodate the smaller aircraft in use at that time. As a consequence, some of these airports have airfield separations that are not compatible with current Federal Aviation Administration (FAA) design requirements and recommendations. Moreover, existing airports need to increase their capacity to meet demand. Many of these airports are constrained by urban development and physical and environmental restrictions, or they do not have the necessary real estate to accommodate the applicable separation standards.

With this potential traffic growth, many airports will need to bring larger aircraft and use instrumented runways to increase their capacity; however, existing separations may not be appropriate for larger aircraft or for upgraded approach categories.

When existing separations do not meet FAA standards, a request for modification of standards (MOS) may be required, and authorization for the operation may be granted if the MOS fulfills the criteria described in FAA's Advisory Circular (AC) 150/5300-13, Airport Design (FAA, 1989). In the context of this study, MOS means any change to FAA dimensional standards, other than those for runway safety areas (RSAs), applicable to an airport design or construction project (new, reconstruction, expansion, or upgrade).

So far, requests dealing with airfield separations have been analyzed according to non-risk-based methodologies, and the only available guidance is described in AC 150/5300-13 (FAA, 1989). This process can affect airport efficiency and capacity and, potentially, prevent certain aircraft from using an airfield. On the other hand, some of the factors that lead to aircraft accidents/incidents are considered under subjective criteria. This research addresses a more consistent risk-based decision-making process to analyze the separation standards at those constrained airports.

Project Goals

The main objective of this research was to develop a methodology for assessing the risk of aircraft collisions associated with non-standard airfield separations. The methodology is intended to provide a quantitative basis to support MOS requests by airport operators for airfield separations that do not meet FAA standards. This study is not aimed at modifying existing standards but rather at allowing an airport operator to assess the level of safety when those standards cannot be met. The methodology was developed to be simple and practical, allowing airport operators to estimate whether the level of risk is acceptable and to compare it to the level of risk achieved when the standard separations are met.

Major Challenges Associated with Airfield Separations

In the coming years, it is expected that air transportation will experience greater growth than has been observed during the 2008 to 2011 recession period. Anticipating the higher demand for flights, airlines are operating larger aircraft with greater seating capacity. However, it is sometimes impracticable to meet the separation standards for larger aircraft due to a number of physical, social, economical, and environmental limitations.

There is no acceptable method available to estimate the level of protection provided by existing airport layouts when evaluating the operation of large aircraft in terms of the probability of collision with another aircraft, vehicle, or object. Current separation standards have provided an excellent level of safety, as evidenced by the small number of accidents associated with

lateral deviations of aircraft. However, when standards cannot be met, there is no process by which to evaluate the level of risk of the smaller airfield separations.

Many aircraft collisions occur during taxiing operations. Over 20 percent of Part 121 accidents in 2005 were characterized as on-ground collisions with objects during taxi or standing (NTSB, 2009). These are collisions between two aircraft, between an aircraft and ground equipment, or between an aircraft and a stationary structure. Some of these accidents may be associated with airfield separations, and it is necessary to evaluate how these separations and lateral aircraft deviations interact to provide an assessment of the risk of collision.

Over 34 percent of fatal accidents with worldwide commercial jets occur on the ground (Boeing, 2009). Runway veer-offs and overruns represent 24 percent of all incidents and accidents in air transport operations (IFALPA, 2008). These types of events happen at an approximate rate of one per week, emphasizing the challenge that airport operators face, particularly when considering substandard airfield separation distances.

The Australian Transport Safety Bureau (ATSB) analyzed 141 accidents with 550 fatalities for commercial aircraft worldwide from 1998 to 2007. All fatal accidents were catastrophic runway excursions, and 120 of these occurred during landings (ATSB, 2009).

Airfield separations and runway and taxiway safety areas have been established and regulated to help reduce the risk of collisions and to mitigate the consequences of runway and taxiway excursions. Airfield separations are determined on the basis of the location, aircraft wingspan, random lateral and vertical deviations, and a separation margin of safety to account for extreme deviations. Over the years, aircraft wingspans have been increasing gradually, and the FAA has developed new separation standards to accommodate these larger aircraft.

The introduction of new large aircraft (NLA) is still in process and will continue bringing challenges to the aviation industry. NLA will have a significant impact predominantly on existing airports, particularly large hubs, due to the aircraft passenger capacity, weight, wingspan, length, tail height, and wheelbase. Some of the current airport separations between runways versus runways, taxiways, taxilanes, moveable and fixed objects, and taxiways versus taxiways, taxilanes, moveable and fixed objects, etc., may not be adequate to accommodate the introduction of NLA. Most airports with separations inadequate to accommodate NLA do not have enough space for construction of new facilities or for relocation of existing facilities to comply with current FAA standards.

It is important to emphasize that it is not only NLAs or existing aircraft like Lockheed C5 and Antonov AN124 that pose challenges to existing airports; recent and new aircraft, such as the Airbus A340-600 and B777-300 ER, require changes in some aspects of airport infrastructure due to their long fuselage length and associated long wheelbase.

FAA Modification of Standards

The FAA established the Airport Reference Code (ARC) system to aid in the geometric design of runways, taxiways, and other airport facilities. The system and the airfield separations associated with each code are described in AC 150/5300-13 (FAA, 1989). The ARC is based on aircraft dimensions and approach speeds to define several physical characteristics of airfields, including airfield separations. Standard distances were established for each aircraft category; although in certain cases it is possible to request a modification of standards.

According to AC 150/5300-13 (FAA, 1989):

> Modification to standards means any change to FAA design standards other than dimensional standards for runway safety areas. Unique local conditions may require modification to airport design standards for a specific airport. A modification to an airport design standard related to new construction, reconstruction, expansion, or upgrade on an airport which received Federal aid requires FAA approval. The request for modification should show that the modification will provide an acceptable level of safety, economy, durability, and workmanship. (CHG 10, Chapter 1, p. 5)

A survey conducted by the FAA in 2008 identified 142 airports that can accommodate Cat II and Cat III approaches. Of these 142 airports, 63 airports have less than a 500-ft separation between the runway and parallel taxiway, and three have less than a 400-ft separation, measured within the first 3,000 ft of the runway.

What is the risk if larger aircraft are allowed to operate at these airports with non-standard separations? Currently, there are no risk-based methodologies for assessing such risks, and each situation is treated as a unique case. The FAA may allow operation at airports that do not comply with minimum separation distances by evaluating an MOS submitted by the airport operator. The objective is to keep the airport/aircraft operations at a level of safety equivalent to that achieved by standard separations.

The FAA uses a computer program that considers the relationship between airplane physical characteristics and the design of airport elements to show that an MOS provides an acceptable level of safety for the specified conditions, including the type of aircraft (FAA, 1989).

AC 150/5300-13 also states that values obtained from the specific equations presented in the next chapter may be used to demonstrate that an MOS will provide an acceptable level of safety (FAA, 1989). The criteria are based on engineering judgment and can only be used to compare taxiway and taxilane separations. However, in the context of this study, it was necessary to address separations between runways and taxiways or taxilanes. There is no procedure in the FAA guidance material to evaluate runway separations for the risk of collision between an aircraft landing or taking off and a taxiing aircraft or an object.

CHAPTER 2

Airfield Separation Rationale

A preliminary task in the study was the identification of approaches that could be used as a framework for the risk-assessment methodology. The first step was the gathering of information on two basic rationales—that used by the FAA and that used by the International Civil Aviation Organization (ICAO)—to establish their airfield separation standards.[1] The bases for the development of both rationales were the random deviations of aircraft during operations. Such deviations are greater for runways and less for taxiways and taxilanes. In addition, some incidents may lead to very large deviations (e.g., runway excursions), and safety areas must be planned to mitigate the risk of these large deviations.

FAA Rationale

Most of the FAA documents reviewed for this study present the separation standards and sometimes identify design considerations, but they rarely provide detailed information on the design rationale. For this reason, two engineers were interviewed. They worked in the FAA airport organization that was responsible for developing design standards, including the separation standards. Also, an attempt was made to place several of the documents in the context of the historical time when they were issued.

In 1940, the Civil Aeronautics Authority issued a document entitled *Airport Design Information* (1940). The manual was "prepared for the instruction and guidance of Airport Section Engineers in their field consultation activities" (Hathi Trust Digital Library). It provided standards for four airport classes that were based on runway lengths required by aircraft expected to use the facility. The Civil Aeronautics Administration (CAA) published an updated version of this manual in 1941. In April 1944, the CAA published the first of four manuals titled *Airport Design.* This manual had standards for five classes of airports, with the classes based on runway lengths required by aircraft expected to use the facility.[2]

It is important to remember that these manuals were developed just prior to and during World War II. At that time, the United States had a massive war mobilization effort underway, and it is unknown if the manuals were the output of any intensive research and development effort. In all likelihood, the standards were based on the best engineering judgment of the era.

In January 1949, the CAA published the second manual titled *Airport Design,* and it provided for eight different airport classes. These classes were based on the type of service rather than the expected type of aircraft.

In relation to the historical context of this document, there are two points worthy of note:

- The standards contained in the document represent the knowledge gained from aircraft operations during World War II.
- In 1946, the Federal Aid Airport Program (FAAP) was enacted to provide federal funds to airport sponsors for capital development at their airports, and the program required that such development be done in accordance with standards issued by the CAA.

The importance of the FAAP cannot be overemphasized. This carrot and stick approach was successful in achieving uniformity of design within the various airport classes; however, there were so many classes that it was easy to incorrectly predict an airport's ultimate role in the national airport system.

[1] FAA and ICAO may use different terminology for their standards and recommended practices. Throughout the text, the original terms for each agency were kept. For example, the FAA "runway safety area" function is equivalent to that of ICAO's "graded area of the runway strip" plus its "runway end safety area."

[2] The information on these manuals is taken from a paper prepared by Robert David in 1973 (David, 1973). At that time, the documents were obtained from the FAA library, but they are no longer available.

Table 1. Minimum clearance standards of airports (ft) (FAA, 1959).

Type of Service	Runway Centerline to Taxiway Centerline	Centerline of Parallel Runways for Contact Operations	Centerline of Parallel Taxiways	Taxiway Centerline to Aircraft Parking Areas	Taxiway Centerline to Obstacle
Secondary	150	300	125	100	75
Local	250	500	200	175	100
Trunk	350	500	275	240	150
Continental	400	700	300	260	175
Intercontinental	450	700	325	280	200

In August 1959, the FAA issued Airport Engineering Data Sheet Item 24 as a revision to the table that appeared in the 1949 publication (see Table 1).

This data sheet reduced the number of airport classes from eight to five. The data sheet stated, "In order to assure maximum safety and the economical and efficient use of the airport site, careful consideration must be given to the clearance and separation between the various aircraft operating areas" (FAA, 1959, p. 1). It states that the distances established are recommendations and further states "increases to these distances may be desirable in some cases, necessary in others" (FAA, 1959, p. 1). It appears that although some classes were consolidated and renamed, only minor changes were made to the actual distances. No specific information is provided as to how these separation standards were defined.

This document was issued 2 months before the "jet" age in U.S. commercial aviation began. In October 1959, nonstop transatlantic flights with Boeing 707s were initiated between New York's Idlewild Airport (now known as John F. Kennedy International Airport) and Europe.

In 1961, the FAA published the third document titled *Airport Design* (Federal Aviation Agency, 1961). The revised standards (see Table 2) were no longer based upon the type of service, but rather on the runway length.

In the early 1960s, the FAA initiated the Advisory Circular publication series. Although the information in these publications was advisory, the airport standards contained in them became mandatory when federal aid was used for airport development. As documents were updated to conform to the new publication system, there was a tendency to develop Advisory Circulars containing design information for a specific type of airport. For example, AC 150/5300-1, VFR Airports, applied to airports that were intended to have operations by general aviation aircraft during visual meteorological conditions (FAA, 1963). AC 150/5300-4A, Utility Airports, was issued to provide guidance and standards for airports that intended to serve aircraft weighing 12,500 lb or less (FAA, 1968).

Table 2. Airport design and clearance recommendations (ft) (Federal Aviation Agency, 1961).

Runway Length	Runway Centerline to Taxiway Centerline	Centerline of Parallel Taxiways	Taxiway Centerline to Aircraft Parking Areas	Taxiway Centerline to Obstacle
1,600–3,200	150	100	100	75
3,201–4,200	250	200	175	100
4,201–6,000	400	300	250	200
6,001–7,500	400	300	250	200
7,501–10,500	400	300	250	200

During the late 1960s and through the 1970s, there were several Advisory Circulars published on specific aspects of airport design for airports intended to serve air carriers. Subjects of these Advisory Circulars included such things as runway geometry, taxiways, surface gradient and line-of-sight, and jet blast.

During this period, there were no funds allocated for the research and development of design standards. The runway/runway and runway/taxiway separation standards contained in these publications were based on the experience gained during the post-World War II period, including experience with the precision of navigational aids such as instrument landing systems (ILSs), the ability of pilots to stay on centerline, and air traffic control considerations. In the 1960s, the FAA's Flight Standards organization and the ICAO Obstacle Clearance Panel (OCP) developed the Collision Risk Model (CRM)[3] for ILS operations. The CRM was based on actual observation of 2,500 aircraft on an ILS precision approach to a runway. Four observations were made for each aircraft's approach. This model was used to define the area that needed to be protected on an airport when an aircraft was making an ILS approach. The runway/taxiway separation also took into account the possibility of an aircraft on landing rollout or takeoff roll veering off the runway. Additional information on the CRM is provided in Appendix B.

[3] FAA developed the CRM (ICAO, 1980) approach with the University of Oklahoma and input from other countries represented on ICAO's OCP.

The taxiway/taxiway separations were based on taking the most critical aircraft that would be using the taxiways (generally, the aircraft with the largest wingspan) and placing its main gear on the edge of the usable taxiway. The separation between the taxiway centerlines then could be calculated by adding half the width of each taxiway to twice the length of the wingspan that extended beyond the taxiway plus a safety factor. Likewise, the taxiway/object separations were based on taking the most critical aircraft that would be using the taxiways and placing its main gear on the edge of the usable taxiway. The separation between the taxiway centerline and the object could then be calculated by adding half the width of the taxiway to the length of the wingspan that extended beyond the taxiway plus a safety factor.

In the 1980s, in response to feedback from the aviation community, the FAA undertook an effort to consolidate the numerous design Advisory Circulars. In 1983, AC 150/5300-12, Airport Design Standards—Transport Airports, was published (FAA, 1983). This consolidated many of the design standards for transport aircraft into one document. In 1989, the FAA published AC 150/5300-13, Airport Design (the fourth document with this title), which consolidated the design standards for all airports except heliports and sea plane bases into one document (FAA, 1989). This publication grouped standards according to the ARC, consisting of a letter and a Roman numeral. The letter indicates the aircraft approach category and relates to the FAA Flight Standards approach speed group of the design aircraft (as used in terminal instrument procedures [TERP]). Generally, runway standards are related to the approach speed. The Roman numeral relates to the airport design group and the aircraft wingspan of the design aircraft. It is possible to have the approach category based on one design aircraft and the aircraft design group based on a different design aircraft.

Appendix 9 of AC 150/5300-13 provides the design rationale for separations associated with taxiways and taxilanes, except for those between a runway and its parallel taxiway (FAA, 1989). A number of parameters are contained in this appendix. To maintain airport operational capacity, the taxiway system should be designed so that aircraft can maintain an average speed of 20 mph. The parameters affecting taxiway separations for other than parallel taxiways are wingspan and wingtip clearance, with the need for wingtip clearance being driven by the fact that pilots of most modern jets cannot see their wingtips from the cockpit. Appendix 9 then provides the following information on separations:

- Taxiway to taxiway centerline (see Figure 1): Separation is calculated based on 1.2 times the wingspan of the most demanding aircraft plus 10 ft (wingtip clearance).

  $S_{TWY\text{-}TWY} = 1.2 * WS + 10$ ft

  where

  $S_{TWY\text{-}TWY}$ is taxiway to taxiway centerline separation and WS is wingspan of the most demanding aircraft.

- Taxiway centerline to object (see Figure 2): Separation is calculated based on 0.7 times the wingspan of the most demanding airplane plus 10 ft (wingtip clearance).

  $S_{TWY\text{-}OBJ} = 0.7 * WS + 10$ ft

  where

  $S_{TWY\text{-}OBJ}$ is taxiway centerline to object separation.

- Taxiway object free area (OFA): Width is equal to twice the taxiway centerline to object separation.

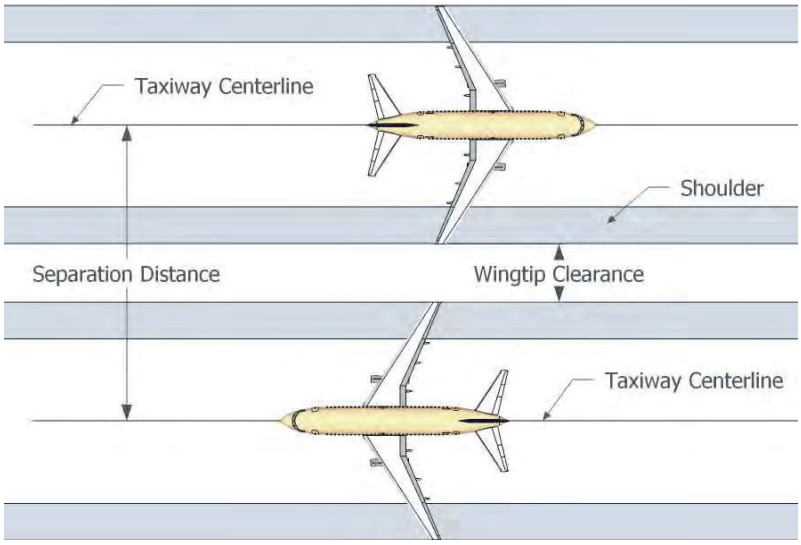


Figure 1. Wingtip clearance, parallel taxiways.

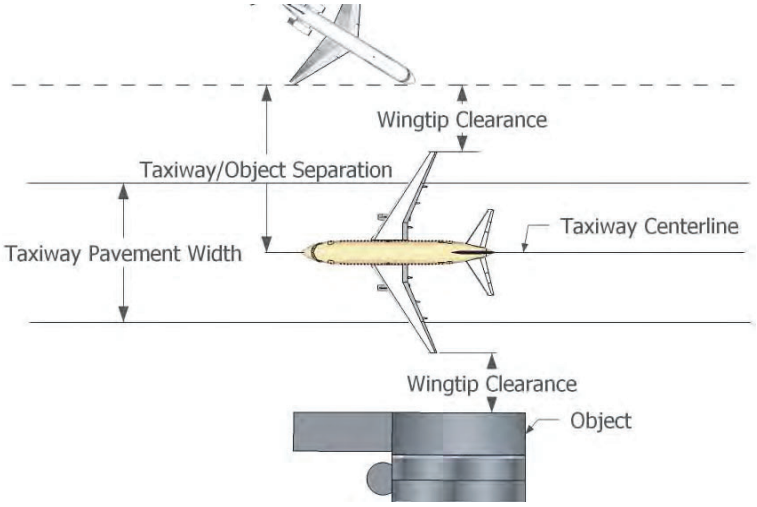


Figure 2. Wingtip clearance from taxiway.

$$\text{TWY-OFA} = 2 * S_{TO}$$

where

TWY-OFA is taxiway object free area width and S_{TO} is taxiway centerline to object separation.

- Taxilane centerline to object (see Figure 3): Separation is calculated based on 0.6 times the wingspan of the most demanding airplane plus 10 ft (wingtip clearance). Reduced clearances are acceptable because taxi speed is very slow outside the movement area, taxiing is precise, and special operator guidance techniques and devices normally are present.

$$S_{TXL\text{-}OBJ} = 0.6 * WS + 10$$

- Taxilane OFA (see Figure 4): Width is equal to twice the taxilane centerline to object separation for a single lane width and 2.3 times the wingspan of the most demanding airplane plus 30 ft for a dual lane.

$$\text{TXL-OFA} = 2 * S_{TXL\text{-}OBJ} \left(\text{single lane}\right)$$

$$\text{TXL-OFA} = 2.3 * WS + 30 \text{ ft } \left(\text{dual lane}\right)$$

Appendix 9 of AC 150/5300-13 does not indicate how the safety factors or the wingtip clearances were determined (FAA, 1989). Interviews indicated that these factors were based on engineering judgment.

As far back as the 1970s, and probably even before then, there were differences in airport design standards and the criteria used to establish instrument approaches. These differences primarily affected the standards associated with runway approaches and separations. Several attempts were made over the years to resolve these differences. This issue became critical in the early 2000s, when an analysis performed using the CRM indicated that aircraft located on a parallel taxiway 400 ft from the runway centerline posed a safety risk to aircraft on an instrument approach to that runway when those aircraft executed a missed approach.

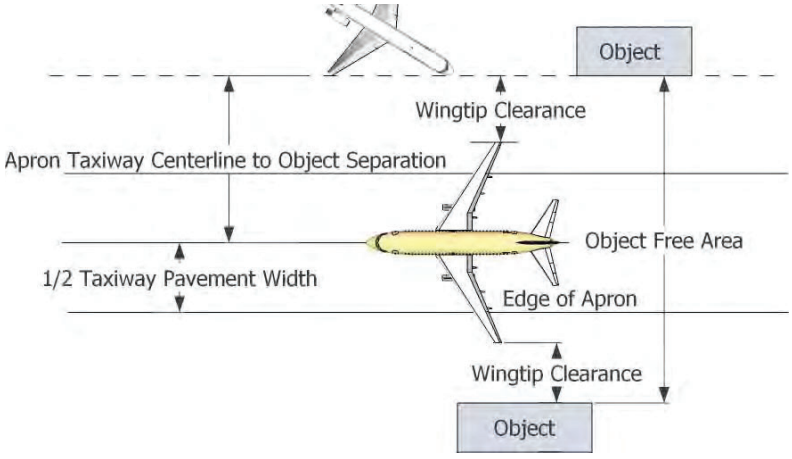


Figure 3. Wingtip clearance for taxilanes.

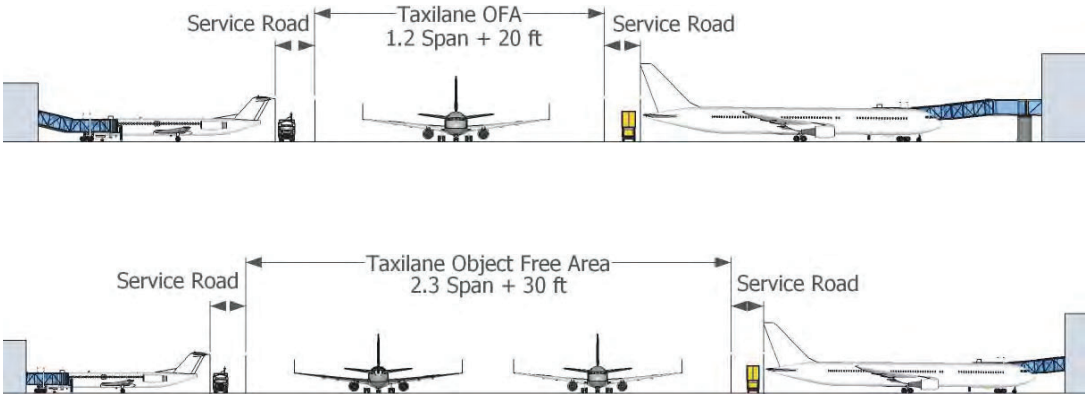


Figure 4. Wingtip clearance for taxilanes.

The issue was given to a multidisciplined group called the Airport Obstructions Standards Committee (AOSC) to resolve. After much deliberation, this group grandfathered runways and taxiways meeting existing separation standards into the airport design standards and determined further analysis was necessary. In the interim, separation standards for construction of new runways or taxiways were increased to 500 ft for Cat II/III operations involving Group V aircraft and for Cat I approaches involving Group VI aircraft. For Group VI aircraft making a Cat II/III approach, a separation of 550 ft would be required between new runways and taxiways. The AOSC work is documented in *AOSC Decision Document #04* (AOSC, 2005).

ICAO Rationale

To harmonize the development of aviation (including airports) globally, the ICAO was established toward the end of World War II with the signing of the Convention on International Civil Aviation (also known as the Chicago Convention) on December 7, 1944. Since then, ICAO has developed and updated international specifications on all aspects of aviation. In Annex 14 to the Chicago Convention, first published in 1949, the ICAO promulgated specifications on airport design and operations (ICAO, 1949).

ICAO has kept pace with technological developments in the aircraft industry and kept Annex 14 current to provide to its Contracting States (or Member Nations) the minimum safety specifications for designing new airports and upgrading existing ones to handle succeeding generations of newer, larger, and heavier aircraft.

Many of the current standards and recommended practices (SARPs) contained in Chapter 3 of Annex 14 were defined by the Aerodrome Reference Code Panel (ARCP) in 1981 (ICAO, 1981). As part of the process to define a new reference code for airports, ARCP also undertook a fundamental review of SARPs based on a more rational approach.

In 1990, Annex 14 was separated into two volumes (ICAO, 1990). Volume I now contains international specifications on aerodrome design and operations only, and Volume II deals with the design of heliports.

Statistics have shown that approach and landing is the most critical phase of a flight because the aircraft must follow a precise and stable approach path despite the challenging circumstances that characterize this flight phase—aircraft engine power is at its minimum, weather conditions on the ground may pose difficulties for landing, and habitation and land developments surrounding airports can be significantly impacted by deviations from the approach path.

Moreover, aircraft may sometimes touchdown before the runway arrival end or reject the takeoff and depart the runway if something goes wrong. These are the main reasons runways have a safety area. The FAA refers to this area as an RSA, whereas the ICAO defines an area with an equivalent function, consisting of the runway strip plus the runway end safety area (RESA). The objective of this area is to reduce the risk of damage to aircraft running off a runway and protect aircraft flying over a runway during takeoff or landing operations. The safety area applies not only to the airspace on or around an airport but also to the ground itself.

Runway Strip Width

ARCP's basis for the specifications of the graded portion of the strip is the acceptable risk of occurrence of aircraft veer-offs. From the information available, there seems to be no defined basis for the development of the specification of the full strip width for the protection of over-flying aircraft using the CRM. ARCP identified the following factors in the definition of the strip width:

- Aircraft approach speed
- Wingspan
- Aircraft mass
- Type of approach (visual or instrument)

Statistical data on aircraft veer-off events presented at the 8th Air Navigation Conference in 1974 were the basis for the

analysis. The frequency of veer-offs exceeding a given distance from the runway centerline were determined according to the type of operation and class of aircraft.

To maintain a safety area around the runway, a runway strip width of 984 ft (300 m) is specified for instrument runways, and a runway strip of 492 ft (150 m) is specified for smaller, non-instrument runways. The strip is symmetrically located on either side of the runway centerline. The central portion is required to be graded to certain specified slopes so that it is less likely that an aircraft will suffer substantial damage during runway veer-offs. These requirements are used to establish a safety area around the runway in which only those objects that must be located there are permitted, subject to the applicable frangibility criteria being met.

Airfield Separations

Every aircraft landing or taking off on a runway must proceed along a system of taxiways. During these movements, aircraft should be protected by wide, obstacle-free areas; thus, even the circulation areas (taxiways and aprons) must be located at suitable distances apart and at a specified distance from the runway.

The early specifications in ICAO Annex 14 were based on the layouts of airfields that existed at the time—mostly military airfields—that were deemed to be examples of best practice. It is not uncommon to see older airports with runways from 98 to 197 ft (30 to 60 m) wide. Similarly, the circulation taxiways were separated from the runways so that aircraft on the taxiway did not cause major risk to aircraft landing or taking off from the runway.

Since then, numerous ICAO studies, undertaken with assistance from ICAO technical panels and study groups, have fine-tuned the specifications as actual aircraft performance results and airport experience have become available. Improvements in aircraft manufacturing technology, better training, and the availability of modern visual aids have also contributed to this fine-tuning.

The broad principles governing airfield separations are explained in greater detail in the following sections.

Separation Distance between a Runway and a Taxiway

A parallel taxiway is located such that no part of the largest aircraft expected to operate on the parallel taxiway would penetrate into the adjacent runway strip. This is intended to accommodate any potential veer-off of a landing aircraft when the taxiway is being used and also to provide a sterile area, free of obstacles that may endanger an aircraft executing a missed approach or balked landing maneuver. The separation distance is expressed as follows:

$$S_{\text{RWY-TWY}} = \frac{SW}{2} + \frac{WS}{2}$$

where

$S_{\text{RWY-TWY}}$ is the distance between the centerlines of a runway and a parallel taxiway,
SW is the runway strip width, and
WS is the aircraft wingspan.

Figure 5 depicts the main factors in the ICAO rationale.

Although a link taxiway for entry into and exit from the runway is located within the runway strip, whenever the runway is in use, an aircraft on a link taxiway is required to stop and hold at a distance of 295 ft (90 m) from the runway centerline (ICAO Code E) (ICAO, 2004). For aircraft designated ICAO Code F, where the wingspan is greater than 213 ft (65 m) but not more than 262 ft (80 m), the holding position location is at a distance of 350 ft (107 m) from the runway centerline (ICAO, 2004). This distance may need to be increased for certain operational conditions, and this minimum holding distance should be reviewed if it interferes with radio navigational aids provided for the runway.

The separation distances between a runway and fixed objects other than visual aids required for air navigation purposes are the following (ICAO, 2006a):

- Within 254 ft (77.5 m) of the runway center line of a precision approach runway Cat I, II, or III where the code number is 3 or 4 and the code letter is F;

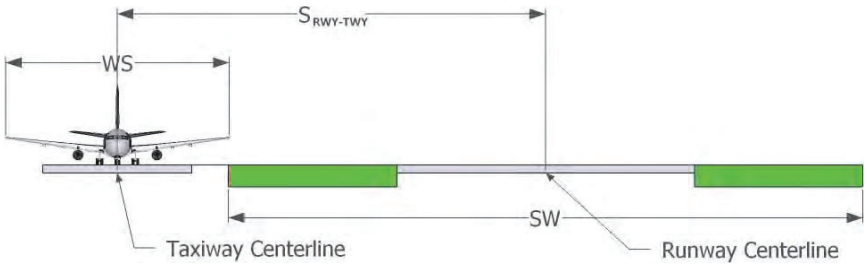


Figure 5. Runway/parallel taxiway separation distance.

- Within 197 ft (60 m) of the runway centerline of a precision approach runway Cat I, II, or III where the code number is 3 or 4; and
- Within 148 ft (45 m) of the runway centerline of a precision approach runway Cat I where the code number is 1 or 2.

In addition, no mobile object shall be permitted on this part of the runway strip during the use of the runway for landing or takeoff.

Separation Distance between a Taxiway and Another Taxiway

Taxiways are vital facilities of an airport on and around which certain safety areas must be provided at all times to ensure that a taxiing aircraft does not collide with another aircraft or an object. A primary assumption here is that an aircraft taxiing on a taxiway may deviate from its centerline; thus, using a "permissible" deviation, the taxiway strip width and taxiway width are determined. The taxiway strip, like the runway strip, should be clear of objects that may endanger taxiing aircraft. Furthermore, all other taxiways and objects that need to be on the operational areas of an airport are built to meet these criteria.

For two aircraft traveling in opposite directions on two parallel taxiways, it initially was deemed appropriate to provide for deviations of both aircraft from their respective centerlines toward each other. It was considered necessary to ensure that in such deviations there was still an adequate safety margin between the wingtips. While the permissible value of the deviation of an aircraft from the taxiway centerline is one factor, abnormal conditions like steering malfunctions, very slippery pavement conditions, low visibility, and poor markings could not be ruled out. Thus, the concept of a safety buffer was introduced to provide an additional safety margin to the separation distance.

The safety buffer, *Z,* is equal to the difference between the half width of the taxiway strip and the semi-wingspan of the largest aircraft in a given category (whose outer wheel is located at the edge of the paved taxiway, in other words, full deviation as permitted and added to the semi-wingspan). The safety buffer illustrated in Figure 6 is determined using the following equation:

$$Z = TCS - WS - C$$

where

Z is the safety buffer,
TCS is the taxiway centerline separation,
WS is the aircraft wingspan, and
C is the clearance between the outer main gear wheel and the taxiway edge (maximum allowable lateral deviation).

When deriving this specific dimension for Code F aircraft, it was considered that the steering mechanism of the Code F aircraft would not be worse than that of the Code E aircraft and, thus, the same deviation value of 15 ft (4.5 m) was retained. However, because it was felt that the wider, swept-back wings of modern aircraft might not permit a pilot in the cockpit to see where the wingtip would be, the safety buffer was increased in proportion to the wingspan increase vis-à-vis that for a Code E aircraft.

Separation Distance between Taxiway and Object

The separation distance between the taxiway and a stationary object is specified in order to ensure that a taxiing aircraft's wingtip does not collide with any stationary object. Because the object is not moving, only one deviation of the aircraft itself is taken into account along with the safety buffer, which includes all other factors that may cause further deviation of the taxiing aircraft. The relationship illustrated in Figure 7 is expressed as follows:

$$S_{\text{TWY-OBJ}} = \frac{WS}{2} + C + Z$$

where

$S_{\text{TWY-OBJ}}$ is the separation,
WS is the wingspan,

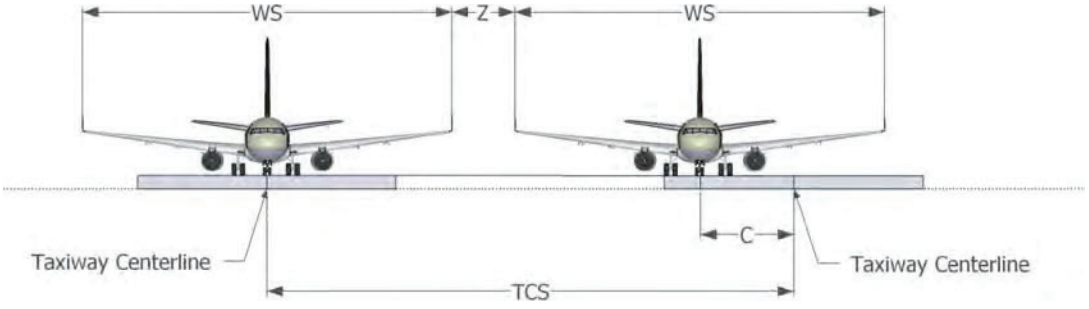


Figure 6. Parallel taxiway separation geometry.

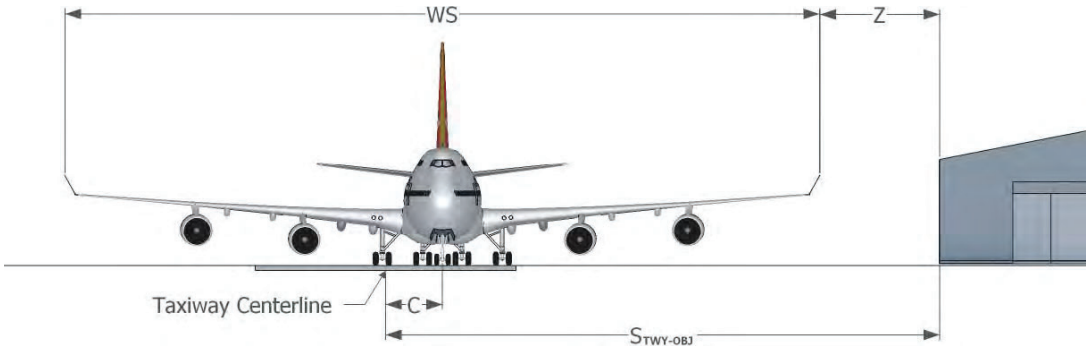


Figure 7. Taxiway/apron taxiway-to-object geometry.

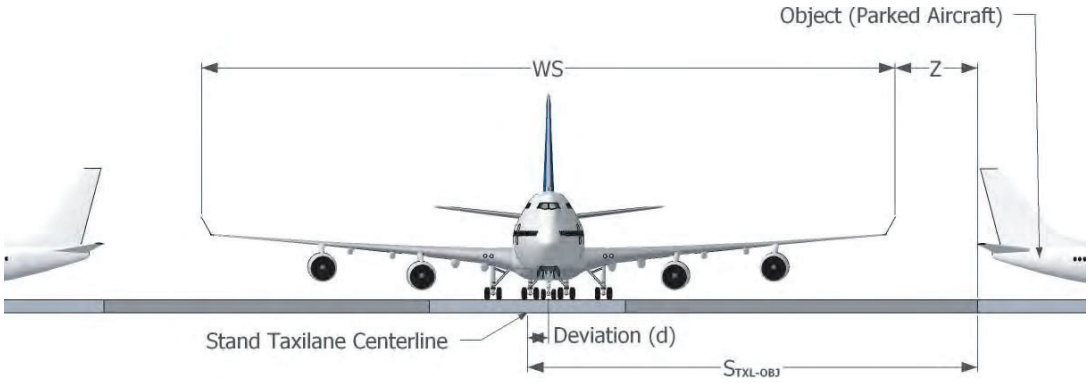


Figure 8. Aircraft stand taxilane-to-object geometry.

C is the clearance between the outer main gear wheel and the taxiway edge (maximum allowable lateral deviation), and

Z = safety margin distance (for example, 10.5 m and 13 m for aircraft Codes E and F, respectively).

Separation Distance between a Taxilane and an Object

For the clearance distance required on an aircraft taxilane, the safety margins are reduced due to the slow taxiing speed of aircraft and the availability of a visual docking guidance system or a marshaller to accurately guide the aircraft. The condition is illustrated in Figure 8. Therefore, for Code E aircraft operations, the *C* value was reduced to 8 ft (2.5 m) and the safety buffer (*Z*) was reduced to 25 ft (7.5 m). The formula is the same as the formula for the distance between a taxiway and an object.

$$S_{\text{TXL-OBJ}} = \frac{WS}{2} + C + Z$$

where

$S_{\text{TXL-OBJ}}$ is the separation distance between the taxilane centerline and an object.

In the case of Code F aircraft, again the 1.6-ft (0.5-m) increase in the *Z* value was engineering judgment to account for the larger wingspan aircraft.

For taxiways and taxilanes, the same document establishes that the minimum separation distance is equal to the wingspan plus max lateral deviation plus increment. ICAO Annex 14—Aerodromes (2006b) contains the standards and recommended practices on airport separations.

CHAPTER 3

Data for Modeling Aircraft Deviations

Airfield Lateral Deviation Studies

During the course of study, an attempt was made to obtain data on extreme lateral aircraft deviations for runways, taxiways, and taxilanes. Also, information was gathered from previous studies and lateral deviation data and models to determine the best alternatives to use in the approach and the methodology to evaluate airfield separations. Appendix C provides a summary of this literature review.

Ensuing sections of this report provide summaries of data collected in this research and describe previous studies evaluating the magnitude of lateral aircraft deviations during airfield operations as well as the attempts to model the probability distributions of these lateral deviations.

A major consideration is random lateral deviations of aircraft during runway, taxiway, and taxilane operations. The probability distribution of such deviations relative to the centerline/guideline of runways and taxiways is crucial to assessing the adequacy of existing separation/clearance distances for safe and regular operation of aircraft, both on straight portions and on taxiway curves. The following factors may impact those deviations (Eddowes, Hancox, and MacInnes, 2001):

- Quality of aircraft nose wheel guidelines (marking and lighting)
- Quality of signs
- Visibility conditions
- Level of light (day or night)
- Surface condition (dry, wet, contaminated by snow/ice, rubber, etc.)
- Approach speed and touchdown location
- Taxi speed
- Pilot's attention
- Pilot's technique during landing
- Stability of approach
- Pilot's technique on negotiation turns
- Wind effects (cross-wind)
- Aircraft handling characteristics
- Mechanical failures

In the 1970s, the FAA and the U.S. Army Corps of Engineers (USACE) carried out substantial studies on lateral distribution of aircraft traffic on runways and taxiways (Brown and Thompson, 1973; HoSang, 1975). More recently, Cohen-Nir and Marchi (2003), the FAA, and Boeing (Scholz, 2003a and 2003b) performed statistical analyses of taxiway deviations for large aircraft at John F. Kennedy International Airport (JFK) and Ted Stevens Anchorage International Airport (ANC).

Veer-Off Accidents and Incidents

Both the FAA and ICAO address the probability of aircraft veer-offs in their rationale for runway/taxiway separations. ICAO (2004) emphasizes that runway separation issues are supported by local airport experience in terms of identifying causes and accident factors specific to the local environment. No less important is the enormous variety and complexity of accident factors for collision risk.

One of the subtasks of this project was to carry out a functional hazard analysis (FHA) for aircraft veer-offs based on information gathered in the literature review. The objective of this subtask was to identify relevant factors associated with such events to support the data collection effort for accidents and incidents. The research team collected information that could be used in the modeling process, particularly data on causal factors and aircraft location. Identifying the most relevant factors causing or contributing to such events also was part of the modeling process.

An FHA is a formal and systematic process for the identification of hazards associated with an activity that is typically employed to support risk assessment and management. An FHA is often conducted in the form of a brainstorming workshop involving a multi-disciplinary team that could include pilots, air-traffic controllers, airside operations personnel, and

specialist risk assessors. The objective of the FHA is to explore relevant operational scenarios and identify hazards associated with them. The output of the FHA is typically a "hazard log," which includes all hazards identified and preliminary information about them that can be provided by the workshop team.

A recent study developed by the Flight Safety Foundation (2009) gathered information worldwide on runway excursion accidents occurring from January 1995 to March 2008. The study presents a matrix of contributing factors that identified common causes and followed trends. The study resulted in the following major conclusions.

The major contributing factors for takeoff excursions include the following:

- Rejecting takeoff after V1 was the most cited factor, which in turn was caused by
  - Pilot's perception of a catastrophic failure
  - Inability to rotate due to incorrect center of gravity (CG) location, mistake in performance calculation, or flight control anomalies
- Loss of directional control, which is generally associated with
  - Mechanical anomalies (30 percent of cases)
  - Contaminated runways
  - Crosswind

The major contributing factors for landing excursions include the following:

- Human errors and neglect of standard operating procedures such as
  - Landing long and/or fast during unstabilized approaches
  - Failing to go around despite unstabilized approach
  - Other pilot's errors, such as hard landing
- Mechanical problems leading to the following:
  - Spontaneous collapse of the landing gear
  - Asymmetric forces due to thrust reverse or braking problems
- Environmental factors such as the following:
  - Crosswind and tailwind conditions
  - Runway surface under wet or contaminated conditions

Information on runway, taxiway, and taxilane events was not readily available to use in this study. Relevant accident and incident reports were identified in worldwide databases. The basic idea was to collect information that could be used to develop risk models based on evidence from past accidents and incidents. Runway and taxiway veer-off accident and incident data were collected from the following sources:

- FAA Accident/Incident Data System (AIDS)
- FAA/National Aeronautics and Space Administration (NASA) Aviation Safety Reporting System (ASRS)
- National Transportation Safety Board (NTSB) Accident Database and Synopses
- Transportation Safety Board of Canada (TSB)
- Australian Transport Safety Bureau (ATSB)
- Bureau d'Enquêtes et d'Analyses pour la Sécurité de l'Aviation Civile (BEA)
- UK Air Accidents Investigation Branch (AAIB)
- New Zealand Transport Accident Investigation Commission (TAIC)
- Air Accident Investigation Bureau of Singapore
- Ireland Air Accident Investigation Unit (AAIU)
- Spain's Comisión de Investigación de Accidentes e Incidentes de Aviación Civil (CIAIAC)
- Indonesia's National Transportation Safety Committee (NTSC)
- Netherlands Aviation Safety Board (NASB)
- MITRE Corporation Accident and Incident Database

A list of accidents and incidents containing the cases used for model development is presented in Appendix D. In addition to the taxiway incidents identified, the list includes runway veer-off events that occurred within 1,000 ft of the runway centerline. Every identified event that has occurred since 1978 and for which reports were available was included in the database for this study.

Portions of the data are complemented with other sources of information, particularly information sources on aircraft, airport, and meteorological conditions. For example, in many cases information on the weather during the accident was missing, and the research team obtained the actual METAR for the airport to retrieve the data. In other situations, the runway used was missing, and the research team consulted the FAA Enhanced Traffic Management System Counts (ETMSC) and the Aviation System Performance Metrics (ASPM) to retrieve relevant information.

Additional filtering criteria were used so that the events were comparable. The first set of filtering criteria was applied so as to retrieve only information from regions of the world having accident rates that are comparable to the U.S. rate. In addition, the filtering criteria described in Table 3 were applied in this study. Filtering was necessary in order to make data collection a feasible task and to ensure that the data used in the modeling process were fairly homogeneous.

Aircraft Veer-Off Database Organization

The accident and incident database was developed in Microsoft Access. The system provides the software tools needed to utilize the data in a flexible manner and includes facilities to add, modify, or delete data from the database;

Table 3. Filtering criteria for accidents and incidents.

Filter #	Description	Justification
1	Remove non-fixed-wing aircraft entries.	Study is concerned with fixed-wing aircraft accidents and incidents only.
2	Remove entries for airplanes with certified max gross weight < 6,000 lb.	Cut-off criteria to maintain comparable level of pilot qualifications and aircraft performance to increase the validity of the modeling.
3	Remove entries with unwanted Federal Aviation Regulation (FAR) parts. Kept Part 121, 125, 129, 135, and selected Part 91 operations.	Some FAR parts have significantly different safety regulations (e.g., pilot qualifications). The following cases were removed: – Part 91F: Special Flt Ops – Part 103: Ultralight – Part 105: Parachute Jumping – Part 133: Rotorcraft Ext. Load – Part 137: Agricultural – Part 141: Pilot Schools – Armed Forces
4	Remove occurrences for unwanted phases of flight.	Study focus is the RSA. Situations when the RSA cannot help mitigating accident and incident consequences were discarded to increase model validity.
5	Remove all single-engine aircraft and all piston-engine aircraft entries.	Piston-engine aircraft are used infrequently in civil aviation and have been removed to increase the validity of the modeling. Moreover, single- and piston-engine aircraft behave differently in accidents due to the lower energy levels involved. Finally, the major focus of this study is air carrier aircraft.
6	Remove all accidents and incidents when the wreckage final location is beyond 1,000 ft from runway centerline.	It would be infeasible to have an RSA more than 1,000 ft from the runway centerline; the gain in safety is not significant.

make queries about the data stored in the database; and produce reports summarizing selected contents. Figure 9 illustrates the database organization.

The database includes for each individual event or operation the reporting agency, the characteristics of the aircraft involved, the runway and environmental conditions, event classification (accident or incident), and other relevant information such as consequences (fatalities, injuries, and damage) and causal or contributing factors. A unique identifier was assigned to each event.

Normal Operations Data (NOD)

Another key approach in this study was the use of normal operations (i.e., non-accident/incident flight) data for probability modeling of runway veer-offs. In the absence of information on risk exposure, even though the occurrence of a factor (e.g., contaminated runway) could be identified as a contributor to many accidents, it is impossible to know how critical the factor was since other flights may have experienced the factor without incidents. With NOD, the number of operations that experience the factor benignly, singly, and in combination can be calculated; risk ratios can be generated; and the importance of risk factors can be quantified. This assessment may allow the prioritization of resource allocation for safety improvement.

The NOD from the research reported in *ACRP Report 3: Analysis of Aircraft Overruns and Undershoots for Runway Safety Areas* was used in this study (Hall et al., 2008). The database was complemented with data for general aviation (GA) aircraft with a maximum takeoff weight (MTOW) of less than 12,500 lb and greater than 6,000 lb. These data are a large and representative sample of disaggregated U.S. NOD covering a range of risk factors associated with runway veer-offs, allowing their criticality to be quantified. The data on U.S. incidents and accidents were used as a sample to develop the frequency models for runway veer-offs only. A sample of the NOD data is available in Appendix E.

Incorporating this risk exposure information into the accident frequency model enhances its predictive power and provides the basis for formulating more risk-sensitive and responsive RSA assessments. Accident frequency models no

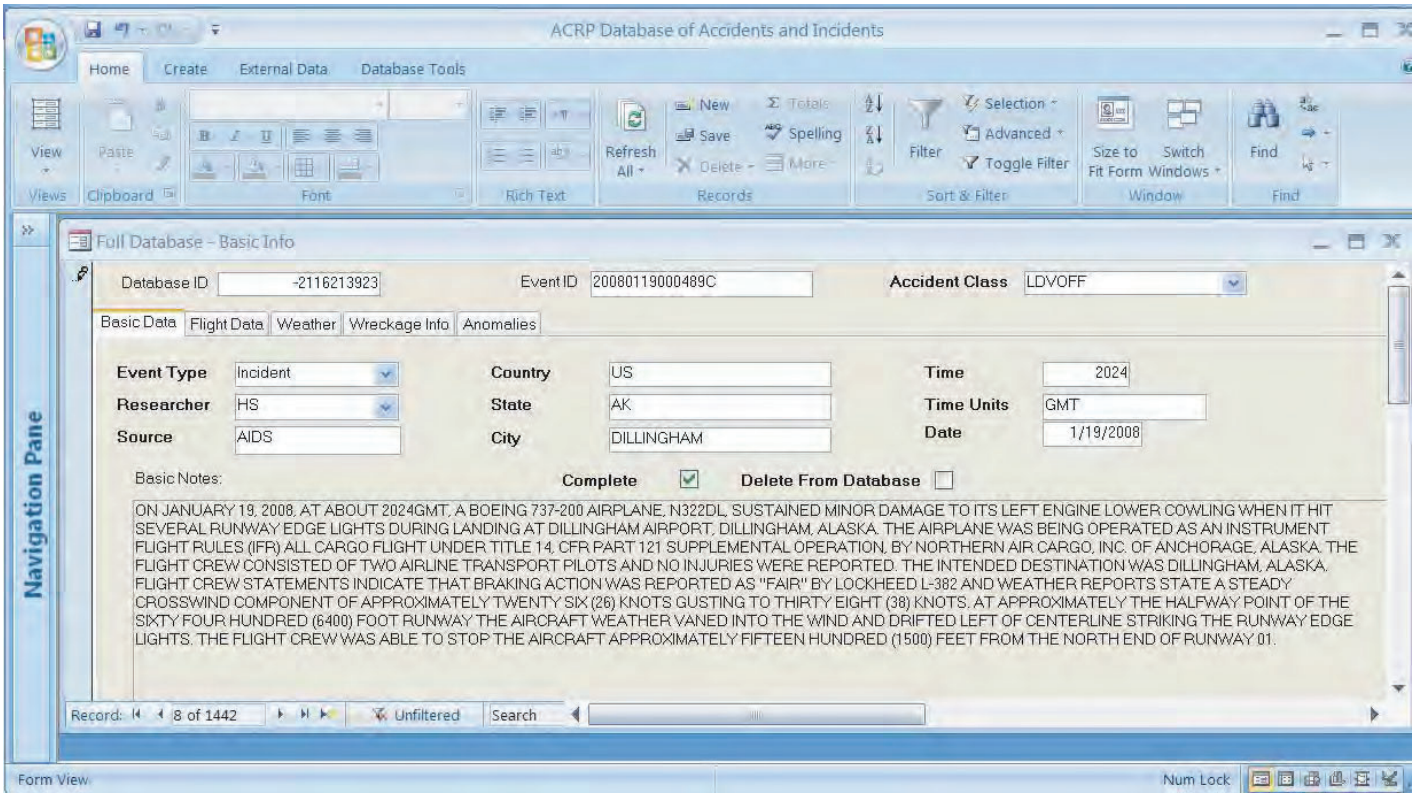


Figure 9. Accident and incident database for aircraft veer-offs.

longer need to rely on simple crash rates based on only aircraft, engine, or operation type.

Aircraft Data

The runway veer-off models incorporate an important factor to address the impact of aircraft performance and available runway length on the probability of veer-off incidents. For many of these events, particularly those taking place during the landing phase, if the runway length available is close to the runway length required by the aircraft for the operation, there may be a higher probability that a veer-off will take place because the safety margin is lower and more intense braking is required.

Two factors were included in the models that required additional data on aircraft performance: the runway distance available for the operation (takeoff or landing) and the aircraft runway distance required for the operation. The runway distance available was gathered for each accident, incident, and normal operation based on airport data.

Aircraft performance data were gathered from various sources, including aircraft manufacturers' websites and the following databases:

- FAA Aircraft Characteristics Database
- Eurocontrol Aircraft Performance Database V2.0
- FAA Aircraft Situation Display to Industry—Aircraft Types
- Boeing Airplane Characteristics for Airport Planning
- Airbus Airplane Characteristics for Airport Planning
- Embraer Aircraft Characteristics for Airport Planning

Aircraft performance data were used to develop the probability models. A summary of the aircraft database is presented in Appendix F.

CHAPTER 4

Methodology Approach

The basic goal of this study was to develop a methodology to evaluate airfield separations. There are a few different scenarios for the analysis of airfield separations, and each requires a different set of models and a specific procedure for the analysis. For example, the evaluation of a separation between a runway and a parallel taxiway requires a different set of models than a separation between a taxiway and an object.

The methodology presented in this report is applicable only to runways and straight parallel sections of taxiways and taxilanes and to straight sections of taxiways and taxilanes when the separation involves an object. The methodology also assumes that the pilot has full directional control of the aircraft, a good visual indication of the taxiway/taxilane centerline, and no assistance from a marshaller. The following are the types of separations that may be evaluated with the methodology:

- Taxiway to parallel taxiway
- Taxiway to parallel taxilane
- Taxiway to object
- Taxilane to parallel taxilane
- Taxilane to object
- Runway to parallel taxiway or taxilane
- Runway to object

The bases for the developed approach are the random lateral and vertical (airborne phase) deviations that may occur during normal operations and veer-off incidents. The risk of collision is related to the probability of large deviations from the nominal flight path and from the runway, taxiway, and taxilane centerlines when aircraft are moving on parallel routes.

Despite intensive efforts to identify taxiway and taxilane incidents, it was not possible to develop two-part models (frequency and location) for taxiway and taxilane veer-offs due to the difficulty in obtaining location data for close to 300 incidents occurring in straight segments of taxiways and very few relevant incidents occurring on taxilanes. However, it was noted that taxiway and taxilane incidents due to aircraft deviations do not lead to departures from the paved area of large distances. In the great majority of the cases, the pilots immediately stopped the aircraft when the aircraft departed the paved area. The following assumptions can be made regarding taxiway operations:

- Aircraft travel at slower speeds relative to runway operations;
- The end of the paved area is a discontinuity that signals to pilots that they are off the taxiway;
- Because the aircraft is traveling slower, the pilot usually has some control and can stop the aircraft almost immediately after departing the taxiway;
- These three factors combined lead to the assumption that the location probability distribution can be truncated for non-ramp taxiways.

Most taxiway and taxilane incidents and accidents occurred in curved segments or because another aircraft or ground equipment was located inside the taxiway or taxilane OFA. In most cases, events with large lateral deviations occurred during poor weather conditions and situations of low surface friction (low visibility, rain, and ice).

Modeling of aircraft lateral and vertical deviations on the runway involved different phases of flight, and for each phase a specific model was developed or used. For approach and landing, the airborne phase was modeled using the FAA/ICAO CRM, and for the rollout phase after aircraft touchdown, a two-part model (frequency and location) was developed and is described in ensuing sections. During takeoff, the factors and risk of veer-off are different from the models for landing, and another set of models (frequency and location) was required for this phase of flight.

Taxiway and Taxilane Deviation Modeling

Initially, the approach for modeling taxiway deviations was a two-part model composed of a frequency model and a location model. Taxiway veer-off incident data were collected to

obtain information on causal and contributing factors (visibility, taxiway surface conditions, etc.) to develop a frequency model to estimate the chance of taxiway veer-off incidents occurring under certain conditions. In addition, it was initially thought that lateral deviation information for those incidents should be collected to develop location models, particularly for aircraft that departed the paved taxiway area. With these two models, it would be possible to estimate the likelihood of an incident occurring with a lateral deviation greater than a certain distance from the taxiway edge. Although enough information was available from the data collection exercise to develop frequency models, information on incident location and deviations was not available.

A couple of observations led to the conclusion that a two-part frequency/location model was not the best approach for modeling taxiway veer-off incidents and the possibility of aircraft collisions with other aircraft and fixed or movable objects. The first observation was that historical taxiway collision events were not related to taxiway deviations; in almost every case, the collision occurred because another aircraft or movable object was inside the wing path of the taxiing aircraft. The second observation was that when a taxiway veer-off occurred, the aircraft stopped immediately after it departed the paved taxiway area.

Therefore, the combination of frequency and location models will only help to estimate the probability that the aircraft will stop off the taxiway paved area, and it will not be possible to quantify the risk of wingtip collisions associated with large deviations to evaluate the taxiway separation. In addition, very few incidents were found to occur when the pilot had control of the aircraft. For taxilanes, even the frequency model could not be developed due to the lack of cases with which to build a database.

The alternative selected was to use the taxiway deviation models developed by FAA/Boeing (Scholz, 2003a and 2003b). The approach and models proved to be in line with the goals for this project. Appendix G provides a summary of the methodology and results from the FAA/Boeing studies. The first report describes the study and deviation models for John F. Kennedy International Airport (JFK), the second describes the study for Ted Stevens International Airport (ANC), and the third combines the deviation models from both studies and describes the models for risk of wingtip collision between two aircraft and between an aircraft and an object. The collision risk between two taxiing aircraft can be estimated using the mean wingtip distance between the two aircraft, in other words, the wingtip clearance when both aircraft are located on the taxiway centerlines.

The deviations at each airport were extrapolated to more extreme deviations as they could happen for significantly higher numbers of event exposures, for example, $10^6 - 10^9$ taxiway operations. Based on the extreme value limiting assumption, absolute deviations were extrapolated using the 700 most extreme deviations at ANC and 200 most extreme deviations at JFK. The model resulting from the analysis was in the following general form:

$$p = 1 - \exp\left(-\frac{1}{n}\left[1 + c\left(\frac{y - \lambda}{\delta} \right) \right]^{-1/c} \right)$$

where

y is the specified threshold of exceedence,

p is the probability estimate of exceeding the threshold y distance from the centerline, and

λ, δ, n, and c are extrapolation parameters for the model.

Cohen-Nir and Marchi (2003) conducted another study using the data collected from JFK and ANC. In processing the JFK deviation data, they identified some problems with the data collected. Several large deviations that would have put the B-747 outside of the taxiway were recorded in a very short period of time. One of the lasers used in the FAA experiment had gone out of service, and all subsequent unusually large deviations occurred with only one laser in service and no ability to measure speed, wheelbase, or direction of travel. Because of the anomalies associated with the data collected from JFK, only the models developed for ANC were used in the airfield separation analysis methodology for this study.

To avoid collision between two taxiing aircrafts with WS_1 and WS_2 wingspans, the combined deviations need to satisfy the following equation:

$$T_{\text{TWY-TWY}} > \left(WS_1 + WS_2\right)/2 + d_1 + d_2$$

where

$T_{\text{TWY-TWY}}$ is the required separation between the taxiway centerlines and

d_1 and d_2 are the deviations of each aircraft, as shown in Figure 10.

A collision between an aircraft wingtip and a fixed or movable object can be avoided if:

$$T_{\text{TWY-OBJ}} > WS/2 + d$$

where

$T_{\text{TWY-OBJ}}$ is the separation between the object and the taxiway centerline,

WS is the wingspan, and

d is the aircraft deviation from the taxiway centerline.

This situation is presented in Figure 11.

One important observation when using the models developed with data gathered from ANC and JFK is that taxiway centerline lights were available in all taxiway sections that were monitored. Therefore, probability distributions characterizing those deviations rely on the conspicuity of taxiway centerlines. An important risk control recommendation when using

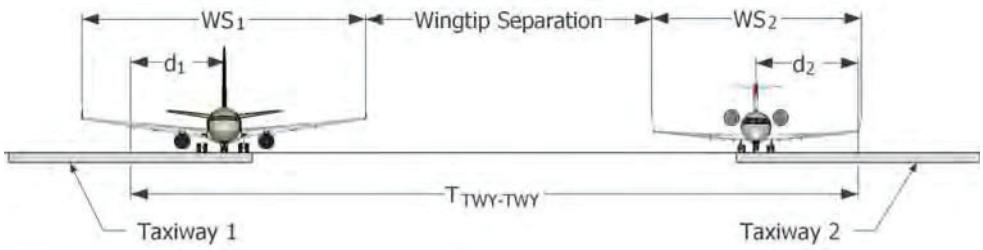


Figure 10. Taxiway/taxiway separation.

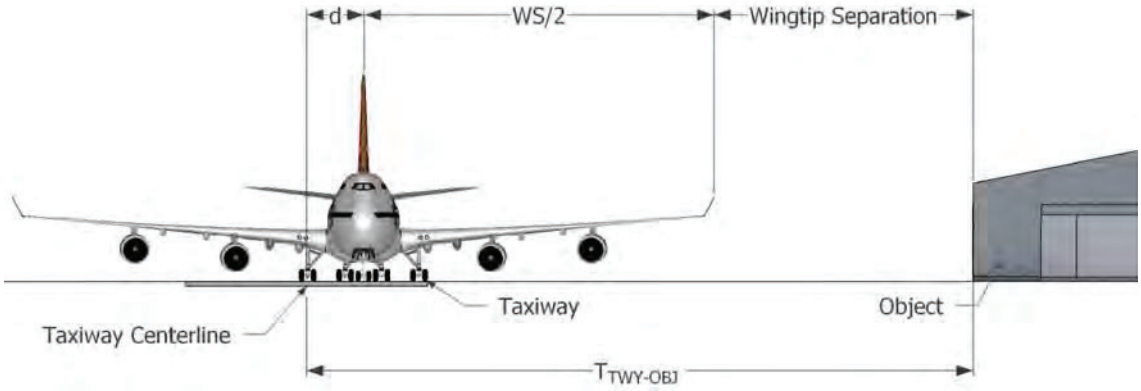


Figure 11. Taxiway/object separation.

this methodology is the assurance that taxiway centerlines will be evident under any conditions when using the taxiways.

Taxiway/Taxiway Separation

The analysis procedure for taxiway/taxiway separation is based on the models presented in the FAA/Boeing study to assess taxiway/taxiway collision probabilities, which are based on the wingtip separation of two aircraft located at the centerlines of two parallel taxiways (Scholz, 2005). In this approach, lateral deviations were split into two halves, and the deviations from the first half were randomly paired with deviations from the second half. In all, 6,157 pairs of $d_1 + d_2$ were obtained. For each set of such pairs, the extreme value extrapolation method was applied to the absolute value of $|d_1 + d_2|$ to obtain estimates of deviation probabilities. To correct for random splitting and pairing effects, the process was repeated 500 times, and a combined estimate with confidence bounds was obtained.

Table 4 presents the probability results, which were applied to the procedure to evaluate taxiway/taxiway separations described in this report. Table 4 presents the probability of wingtip collision based on the separation between taxiway centerlines and the wingspan distance. To facilitate the analysis, plots were developed for each Aircraft Design Group (ADG) based on the maximum wingspan for the specific ADG.

Although the data used to develop the lateral deviation models were collected for the B-747 only, the same models were used to develop risk plots for aircraft belonging to other ADGs. This is a conservative assumption because smaller deviations are expected for smaller aircraft.

The data presented in Table 4 were converted to a plot based on the wingtip separation, which is presented in Figure 12.

Table 4. Required separation between taxiway centerlines.

	Estimate $\leq T$ (ft)						
	collision risk p						
wingspan (ft)	10^{-3}	10^{-4}	10^{-5}	10^{-6}	10^{-7}	10^{-8}	10^{-9}
180	189.4	191.6	193.8	195.9	197.8	199.7	201.4
190	199.4	201.6	203.8	205.9	207.8	209.7	211.4
200	209.4	211.6	213.8	215.9	217.8	219.7	221.4
210	219.4	221.6	223.8	225.9	227.8	229.7	231.4
220	229.4	231.6	233.8	235.9	237.8	239.7	241.4
230	239.4	241.6	243.8	245.9	247.8	249.7	251.4
240	249.4	251.6	253.8	255.9	257.8	259.7	261.4
250	259.4	261.6	263.8	265.9	267.8	269.7	271.4
260	269.4	271.6	273.8	275.9	277.8	279.7	281.4
270	279.4	281.6	283.8	285.9	287.8	289.7	291.4
280	289.4	291.8	293.8	295.9	297.8	299.7	301.4

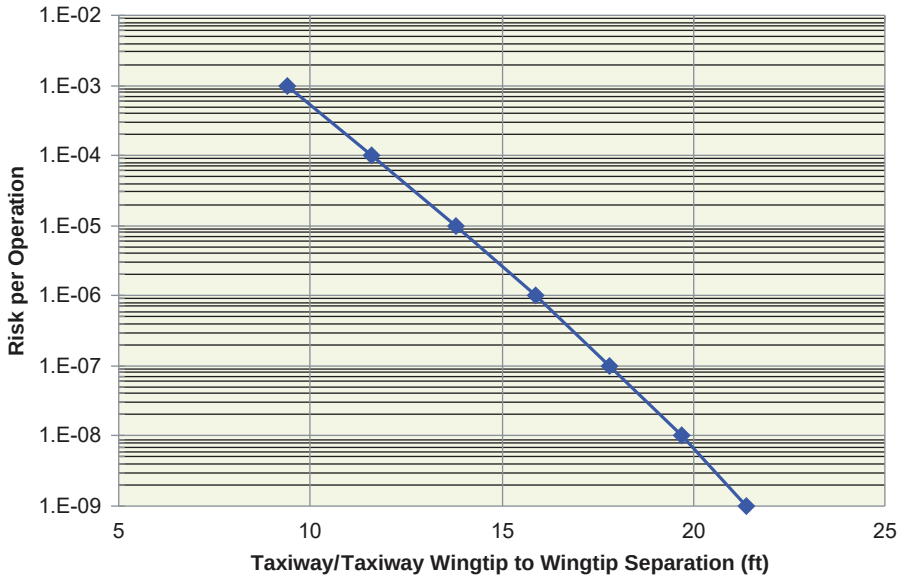


Figure 12. Taxiway/taxiway collision risk.

The same taxiway/taxiway separation models are used to evaluate taxiway/taxilane separations. The estimates of risk for this situation are considered conservative since the speed of aircraft is usually slower in taxilanes and deviations are expected to be smaller than they are for taxiways.

The extrapolation of risk for wingtip separations larger than 25 ft may lead to inaccurate results and very low risks. The standard separation for ADG V is 53 ft; based on the models, the risk for such a condition is lower than 1.0E-15, or one event in one quadrillion operations. This is no surprise, as there are no reports of wingtip collisions between two aircraft on parallel taxiways. In the accident and incident data collected, no record was found for wingtip collisions between two aircraft in parallel taxiways, and therefore the level of protection provided by the standards may be considered very high.

From the point of view of risk and based on the records of incidents and accidents, the worst credible consequence expected for wingtip collisions of two taxiing aircraft is aircraft damage. In this case, according to the risk matrix recommended by the FAA, the risk is acceptable if it is less than one in 10 million operations (1.0E-07), the same collision risk probability level used by ICAO in CRM analysis.

Taxiway/Object Separation

Using the models based on ANC data developed by FAA/Boeing (Scholz, 2003a), the wingtip collision risk can be derived based on the wingtip separation from an object when the aircraft is located at the taxiway centerline. Using this approach provides more flexibility to the analysis for specific aircraft wingspans, rather than considering the largest wingspan in the ADG. As shown in Figure 11, wingtip separation is the distance of the object from the centerline of the taxiway less half of the operating aircraft wingspan. Collision happens only if the deviation of the aircraft exceeds this distance to the side of the taxiway where the object is present. One simplifying assumption is necessary: the wingtip deviation distribution is the same as the aircraft lateral deviation distribution from the taxiway centerline.

Using data from the FAA study, it is possible to estimate the probability of taxiway-object collision based on the mean wingtip separation; in other words, the separation when both aircraft are located at the respective taxiway centerlines (Scholz, 2003a). The basic assumption in this case is that lateral deviations are similar, independent of the type of aircraft. Although this cannot be proved using existing data, the assumption is conservative because the data used to model risk were gathered for large aircraft.

The resulting model based on taxiway deviation data collected at ANC is presented in Figure 13.

Taxilane/Taxilane Separation

Aircraft deviation data or studies were not available to develop probability models for taxilane deviations. The data collection exercise carried out for this research identified a few taxilane veer-off incidents, and insufficient information was available to develop any lateral deviation models. Records of taxilane accidents demonstrate that, in most cases, another aircraft or movable object was parked or located inside the taxilane OFA. Therefore, the occurrence could not be considered a "taxilane deviation" case, and it could occur independently of the existing taxilane separation.

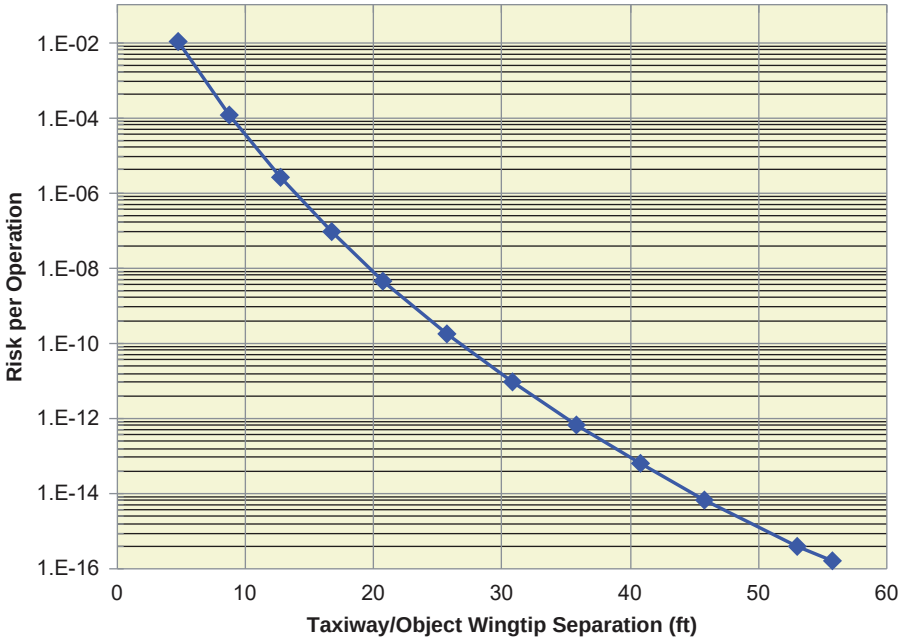


Figure 13. Taxiway/object collision probability based on wingtip separation.

FAA established separation criteria for taxilanes and taxiways and made changes in 1989 (FAA, 1989). These standards are based on aircraft design categories. There is no reference describing the quantitative basis for the criteria, and it is likely that engineering judgment was used to define those standards.

Both the FAA and ICAO recognize that aircraft deviations in taxilanes are usually smaller than those occurring in taxiways. Aircraft taxiing in taxilanes are moving at very low speeds, and pilots are usually very focused on parking operations in areas where movable objects are common.

For the approach presented in this report, the ratios of wingtip separations of taxiway/taxiway to taxilane/taxilane for each ADG were calculated. As shown in Table 5, the ratios varied from 0.75 for ADG I to 0.58 for ADG V and VI.

These ratios were used to adjust the models used for taxiway/taxiway separations developed by the FAA. The rationale is that the risk for veering off a taxilane OFA should be similar to or lower than the risk of veering off a taxiway. Therefore, the wingtip to wingtip separation distances associated with each level of risk for taxiways was adjusted using the ratio corresponding to the ADG. For example, a ratio of 0.58 was applied to the model for lateral deviations on taxiways for ADG V. The resulting model is illustrated in Figure 14.

The plot shows the risk trend for taxilane/taxilane separation of ADG V aircraft based on the mean wingtip separation (i.e., based on the wingtip distance when both aircraft are located on the centerlines of parallel taxilanes). The standards for taxilane separations are considered conservative, given the lack of recorded taxilane incidents associated with lateral deviations.

Figures similar to Figure 14, based on separation between taxilane centerlines, were developed for each ADG based on the ratios presented in Table 6 and the maximum wingspan for the ADG.

Table 5. Taxiway/object and taxilane/object mean wingtip separations for aircraft design groups.

Item	ADG Distances in ft					
	I	II	III	IV	V	VI
Taxiway/Object Wingtip Separation	20	26	34	44	53	62
Taxilane/Object Wingtip Separation	15	18	22	27	31	36
Ratio	0.75	0.69	0.65	0.61	0.58	0.58

Taxilane/Object Separation

Similar to the approach for taxilane/taxilane separations, adjustment factors were applied to the FAA/Boeing models for taxiway/object wingtip separations (Scholz, 2003a). The ratios are the same as those used for the taxilane/taxilane model because the standard wingtip separations between two aircraft and between an aircraft and an object are similar according to AC 150/5200-13 (FAA, 1989).

The standard minimum wingtip to object separation for ADG V in parallel taxilanes is 31 ft and, based on Figure 15, the risk of wingtip collision is lower than 1.0E-09.

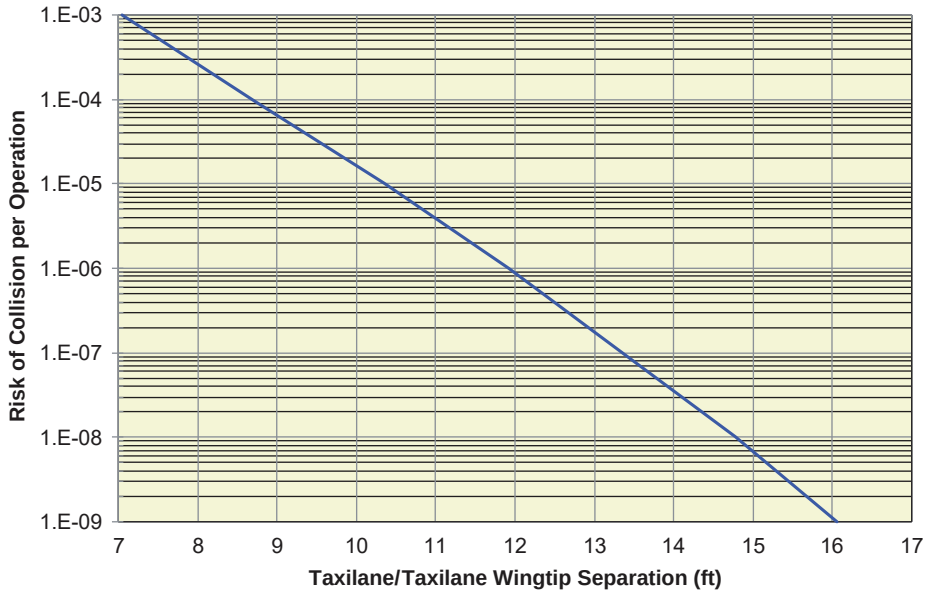


Figure 14. Taxilane/taxilane collision probability based on wingtip separation.

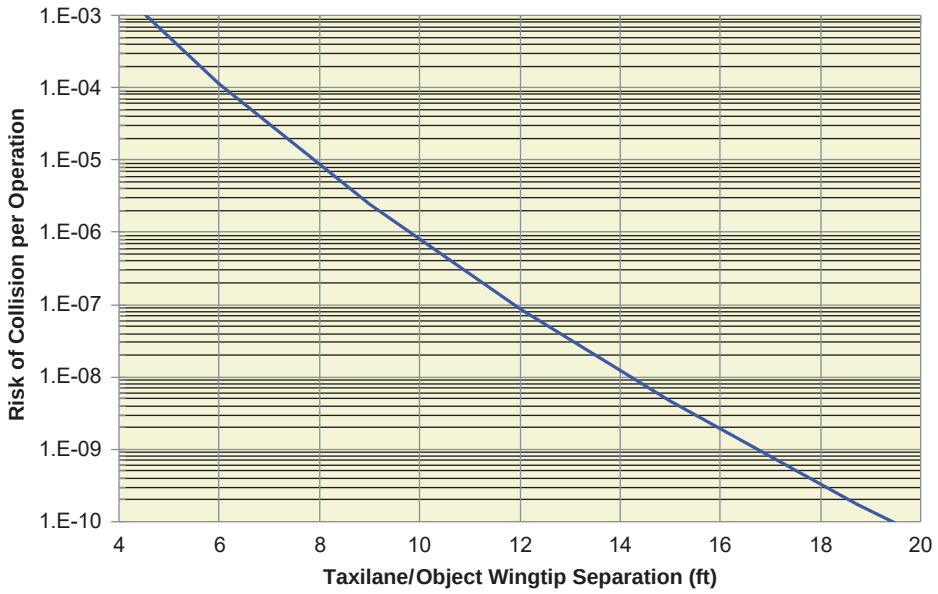


Figure 15. Taxilane/object collision risk based on wingtip separation.

Runway Deviation Modeling

The probability of aircraft collision associated with the separation between the runway and taxiway or objects depends on whether the movement is a landing or a takeoff operation.

For landing there are two types of risk that may be evaluated:

- Risk during the final approach phase when the aircraft is airborne and the combination of large lateral and vertical deviations from the nominal approach path may lead to collision with a fixed or movable object in the airfield area (e.g., an aircraft taxiing in a parallel taxiway).
- Risk if the aircraft loses directional control after touching down and veers off the runway, colliding with fixed or movable objects.

These two types of risk may be combined to provide the total risk for landing. The veer-off risk is estimated for every landing operation, whereas the airborne risk is computed only for missed approaches.

When taking off, the pilot may reject the procedure and intentionally or unintentionally veer-off the runway. If directional control is lost when in high speed, the aircraft may col-

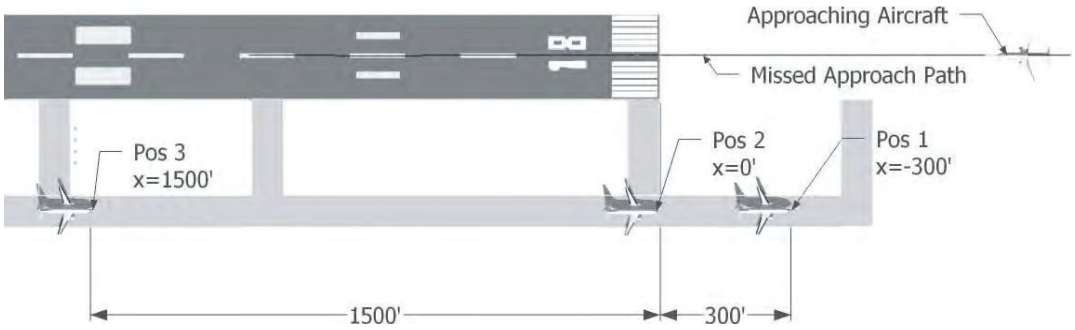


Figure 16. Plan view of CRM run experiment.

lide with fixed or movable objects after departing the runway edge and possibly the RSA.

The methodology used to assess risk during the airborne phase was the CRM. Although the CRM model was developed in the 1970s and the FAA has been improving these models since the 1990s, the original CRM can serve as a screening tool to evaluate the feasibility of submitting an MOS. The FAA has other tools to evaluate the need for further analysis if the risk estimated is within a feasible range. A summary of the CRM approach, variables, and models is provided in Appendix B.

Landing—Airborne Phase Model

It is recognized that running the CRM demands the availability of specific software and the expertise to use it. To facilitate the analysis and the application of the methodology, several CRM runs were made for common situations and different ADGs; however, when the analysis involves specific aircraft rather than an ADG, for the airport to obtain more accurate estimates of risk, the assessment should use direct results from the CRM analysis and specific conditions, if possible.

Several CRM runs were made with obstacles located at various separations from the runway centerline and along the runway length. For Cat I, an obstacle clearance height (OCH) of 200 ft was used, and for Cat II an OCH of 100 ft was used. The ranges used were –300, 0, 1,500, 3,000, and 4,500 ft. Figures 16 and 17 illustrate the experiment run for several runway/taxiway separations. In Figure 16, only ranges of –300, 0, and 1,500 ft are shown.

With the results from the CRM analysis, the maximum risk for each runway/taxiway separation was identified among the five locations along the parallel taxiway. The next step was to develop risk plots for wingtip separation versus risk in terms of accidents per number of operations. The process was repeated for each ADG, and risk plots were prepared for each group and instrument approach Cat 1 and 2.

The approach to estimating risk using the plots presented in Appendix A may be viewed as conservative for the following reasons:

- Only the highest risk along the runway length was used for the estimate of collision risk.

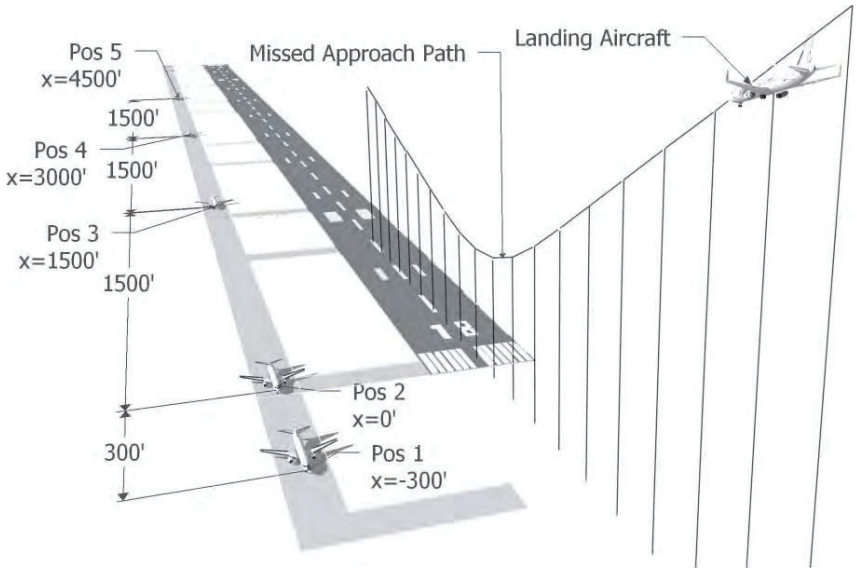


Figure 17. Perspective view of CRM run experiment (not to scale).

- The tallest tail height in the ADG was used to characterize the taxiing aircraft as an obstacle.
- The widest wingspan in the ADG was used to characterize the dimension of the approaching aircraft.
- The taxiing aircraft was assumed to be a fixed object; however, for many airports, a taxiing aircraft will not be present during most of the landings.
- A missed approach rate of 1 percent was kept for the calculations. Based on the latest FAA data, even a 0.2-percent rate is conservative (FAA, 2008).

Runway Veer-Off Models for Landing and Takeoff

During the landing, after touchdown, or during the takeoff roll, the pilot may lose directional control. Some common causes and contributing factors include low runway friction, mechanical failures, and adverse weather conditions.

The basis of the approach used in this study is the probability of aircraft runway excursions and the risk that an aircraft will stop outside the boundaries of the existing or planned RSA. The approach to model risk of collisions is accomplished by using a combination of frequency and location models. In a sense, the modeling considered the bounds of the RSAs rather than the presence of obstacles in the vicinity of the RSAs or the aircraft speed when striking obstacles. While the difference makes the new models simpler, the approach can be extended to consider risk if this type of analysis is required. The two-part model approach is represented in Figure 18.

Event Probability (Frequency Model)

The likelihood of an aircraft veer-off incident depends on operational conditions and human factors. It includes airport characteristics, weather conditions, and aircraft performance, as well as the relationship between the runway distance required by the aircraft for the given conditions and the runway distance available at the airport.

Similar to the approach presented in *ACRP Report 3* (Hall et al., 2008), backward stepwise logistic regression was used to calibrate the veer-off frequency models. Data were gathered from accidents and incidents and NOD. To avoid the negative effects of multicolinearity on the model, correlations between independent variables were tested to eliminate highly correlated variables, particularly if they did not contribute significantly to explaining the variation of the probability of an accident.

The selected approach can identify relationships missed by forward stepwise logistic regression (Hosmer and Lemeshow, 2000). The predictor variables were entered by blocks, each consisting of related factors, such that the change in the model's substantive significance could be observed as the variables were included.

The basic model structure used is logistic, as follows:

$$P\{Accident_Occurrence\} = \frac{1}{1+e^{b_0+b_1X_1+b_2X_2+b_3X_3+\ldots}}$$

where

$P\{Accident_Occurrence\}$ is the probability (0–100%) of an accident type occurring given certain operational conditions,

X_i are independent variables (e.g., ceiling, visibility, crosswind, precipitation, and aircraft type), and

b_i are regression coefficients.

Several parameters were considered for inclusion in the models. The backward stepwise procedure helps identify the most relevant variables for each type of event. One major improvement relative to models presented in previous studies was the use of tailwind and headwind. These variables were not present in the overrun and undershoot models presented in *ACRP Report 3* (Hall et al., 2008) because the actual runway had not been identified in the NOD. The research team gathered information on the runways used, and the process allowed the calculation of the head/tailwind components of the model.

Another major accomplishment that has increased model accuracy was the inclusion of a runway criticality factor. The new parameter represents the interaction between the runway distance required by the aircraft and the runway distance available at the airport. The logarithm of the ratio between the distance required and the distance available was used to

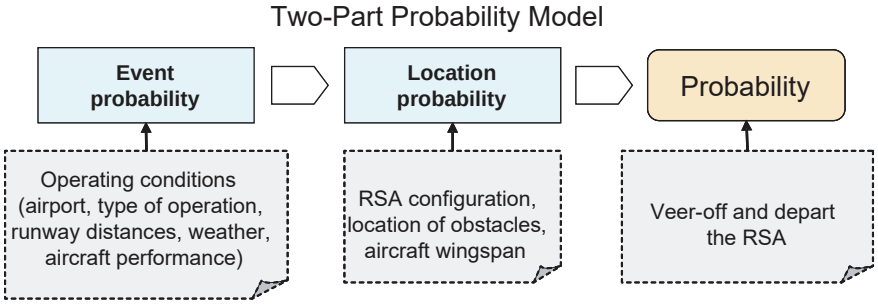


Figure 18. Modeling approach.

represent the criticality factor. The greater the value, the more critical the operation because the safety margin decreases, and in many cases strong braking or the possibility of overruns may lead to veer-off events.

The distance required is a function of the aircraft performance under specific conditions. Therefore, every distance required under International Organization for Standardization (ISO) conditions (sea level, 15 deg centigrade) was converted to actual conditions for operations. Moreover, the distances were adjusted for the runway surface condition (wet, snow, slush, or ice) and for the level of head/tailwind. The adjustment factors for runway surface conditions are those recommended by the Flight Safety Foundation (2009).

To summarize, the runway distance required was adjusted for temperature, elevation, runway surface conditions, and wind. Table 6 presents the factors applied to the distance required by the aircraft. A correction for slope was not applied, as this factor had little effect on the total distance required.

The use of NOD in the accident frequency model was a major improvement introduced in *ACRP Report 3* (Hall et al., 2008), and it was maintained for this study. The analysis with NOD also adds to the understanding of cause and effect relationships for veer-off incidents. Table 7 summarizes the model coefficients obtained for each veer-off frequency model.

Table 8 summarizes the parameters representing the accuracy of each model obtained presenting the R^2 and C-values

Table 6. Correction factors applied to required runway distance.

Local Factor	Unit	Reference	Adjustment	Factor Definitions
Elevation (E) [(i)]	1000 ft	E = 0 ft (sea level)	$F_e = 0.07 \times E + 1$	F_e is runway distance adjustment factor for elevation
Temperature (T) [(i)]	deg C	T = 15 deg C	$F_t = 0.01 \times (T - (15 - 1.981 E) + 1$	F_t is runway distance adjustment factor for temperature
Tailwind (TWLDJ) for Jets [(iii)]	knot	TWLDJ = 0 knot	$F_{TWJ} = (RD + 22 \times TWLDJ)/RD$ [(ii)]	F_{TWJ} is runway distance adjustment factor for tailwind (jets)
Tailwind (TWLDT) for Turboprops [(iii)]	knot	TWLDT = 0 knot	$F_{TWP} = (RD + 30 \times TWLDT\}/RD$	F_{TWT} is runway distance adjustment factor for tailwind (turboprops)
Headwind (HWTOJ) for Jets [(iii)]	knot	HWTOJ = 0 knot	$F_{HWJ} = (RD + 6 \times HWTOJ)/RD$	F_{HWJ} is runway distance adjustment factor for headwind (jets)
Headwind (HWTOT) for Turboprops [(iii)]	knot	HWTOJ = 0 knot	$F_{TWP} = (RD + 6 \times HWTOT)/RD$	F_{HWT} is runway distance adjustment factor for headwind (turboprops)
Runway Surface Condition – Wet (W) [(iv)]	Yes/No	Dry	$F_W = 1.4$	F_W is runway distance adjustment factor for wet pavement
Runway Surface Condition – Snow (S) [(iv)]	Yes/No	Dry	$F_S = 1.6$	F_S is runway distance adjustment factor for snow-covered pavement
Runway Surface Condition – Slush (Sl) [(iv)]	Yes/No	Dry	$F_{Sl} = 2.0$	F_{Sl} is runway distance adjustment factor for slush-covered pavement
Runway Surface Condition – Ice (I) [(iv)]	Yes/No	Dry	$F_I = 3.5$	F_I is runway distance adjustment factor for ice-covered pavement

i - temperature and elevation corrections used for runway design
ii - RD is the runway distance required
iii - correction for wind are average values for aircraft type (jet or turboprop)
iv – runway contamination factors are those suggested by Flight Safety Foundation (2000)

Table 7. Independent variables for veer-off frequency models.

Variable	LDVO	TOVO[1]	Variable	LDVO	TOVO[1]
Adjusted Constant	−13.088	−15.612	Temp from 5 to 15°C	−0.453	−0.420
User Class G	1.682	2.094	Temp more than 25°C	0.291	−0.921
Aircraft Class A/B	−0.770	−0.852	Icing Conditions	2.67	[3]
Aircraft Class D/E/F	−0.252	−0.091	Rain	−0.126	−1.541
Visibility less than 2 SM[2]	2.143	2.042	Snow	0.548	0.963
Visibility from 2 to 4 SM	[3]	0.808	Frozen Precipitation	−0.103	[3]
Visibility from 4 to 8 SM	[3]	−1.500	Gusts	−0.036	[3]
Xwind from 5 to 12 kt	0.653	0.102	Fog	1.740	[3]
Xwind from 2 to 5 kt	−0.091	[3]	Turboprop	−2.517	1.522
Xwind more than 12 kt	2.192	0.706	Foreign Origin/Destination	−0.334	−0.236
Tailwind from 5 to 12 kt	0.066	[3]	Hub/Non-Hub Airport	[3]	−0.692
Tailwind more than 12 kt	0.98	[3]	Log Criticality Factor	4.318	1.707
Temp less than 5°C	0.558	0.988	Night Conditions	−1.360	[3]

[1]LDVO = landing veer-off; TOVO = takeoff veer-off.
[2] SM = statute miles.
[3] Blank cells indicate that there are no coefficients associated with these parameters.

Where

Equipment Class	Ref: C	Large jet of MTOW 41k-255k lb (B737, A320 etc.)
Heavy Acft	AB	Heavy jets of MTOW 255k lb+
Commuter Acft	D	Large commuter of MTOW 41k-255k lb (small RJs, ATR42 etc.)
Medium Acft	E	Medium aircraft of MTOW 12.5k-41k lb (biz jets, Embraer 120 Learjet 35 etc.)
Small Acft	F	Small aircraft of MTOW 12.5k or less (small, single or twin engine Beech90, Cessna Caravan etc.)
User Class	Ref: C = Commercial or F = Cargo or T/C = Taxi/Commuter	
User Class G	G = GA	
Turboprop	Turboprop engine(yes/no) – Ref: Turbojet	
Ceiling Height	feet	
Visibility	statute miles	
Crosswind	knots	
Tailwind	knots	
Gusts	Yes/No – Ref: No	
Icing Conditions	Yes/No – Ref: No	
Snow	Yes/No – Ref: No	
Rain	Yes/No – Ref: No	
Frozen Precipitation	Yes/No – Ref: No	
Fog	Yes/No – Ref: No	
Air Temperature	deg C	
Turboprop Aircraft	Yes/No – Ref: No	
NonhubApt	Yes/No – – Ref: Yes for hub airport	
Log Criticality Factor	If Log(CF) > 0, available runway distance is smaller than required distance	
Night Conditions	Night, Dawn or Dusk – Ref: Daylight	
Notes:		
Ref: indicates the reference category against which the odds ratios should be interpreted.		
Non-hub airport: airport having less than 0.05% of annual passenger boardings		

Table 8. Summary statistics for veer-off frequency models.

Model	R^2	*C*
LDVO	0.32	0.88
TOVO	0.14	0.82

for each model. Relatively low R^2 values are the norm in logistic regression (Ash and Schwartz, 1999), and they should not be compared with the R^2 of linear regressions (Hosmer and Lemeshow, 2000). A better parameter to assess the predictive capability of a logistic model is the *C*-value. This parameter represents the area under the sensitivity/specificity curve for

the model, which is known as the receiver operating characteristic (ROC) curve.

Sensitivity and specificity are statistical measures of the performance of a binary classification test. Sensitivity measures the proportion of true positives that are correctly identified as such (the percentage of accidents and incidents that are identified when using the model). Specificity measures the proportion of true negatives that are correctly identified (the percentage of normal operations that the model can identify as non-incident). These two measures are closely related to the concepts of Type I and Type II errors. A theoretical, optimal prediction can achieve 100-percent sensitivity (i.e., predict all incidents) and 100-percent specificity (i.e., not predict a normal operation as an incident).

To assess how successful the models are in classifying flights correctly as "incident" or "normal," and to find the appropriate cut-off points for the logistic regression model, the ROC curves were defined for each model to calculate the *C*-value as shown in Table 8. The values achieved for the veer-off model are considered very good, with the area under the curve representing a *C*-value higher than 80 percent.

The frequency models developed under this study will require the use of historical information on operations and weather for the specific airport. The necessary information on operations includes the time of the flight, runway used, type of aircraft, type of flight, and whether the operation was an arrival or departure. In addition, it is necessary to collect the weather information for the same period that operational data are available, usually for 1 year.

Weather information can be acquired directly from the National Oceanic and Atmospheric Administration (NOAA) database for the weather station located at the airport. However, the information on operations, particularly for non-towered airports, may be harder to obtain, particularly the identification of the runway used. For towered airports operational data can be requested from the FAA. Another challenge is running the analysis because computations can be made only with the help of a computer and specific software that incorporates these models.

To facilitate the analysis, a series of plots were developed based on average veer-off incident rates for the United States. The rates are presented in Table 9 and were combined with the location models to build the risk plots presented in Appendix A. The average incident rates are based on the number of accidents and incidents, and the total traffic of relevant operations from 1982 to 2009.

From Table 9, one can see that landing veer-offs are approximately four times more likely to occur than takeoff veer-offs.

Event Location

The farthest location of the veer-off path from the runway edge was used to develop the location models. The probability of this distance during an incident is not equal for all locations measured from the runway centerline or runway edge. The probability of veer-off with lateral deviation in the proximity of the runway edge is higher than at larger distances from that boundary. This dependence is represented by the accident location model, which is the second main element of the risk assessment approach. The accident location models are based on historical accident and incident data for aircraft veer-offs.

Worldwide data on accidents and incidents were used to develop the location models. The model structure is an exponential decay function similar to that used in the research reported in *ACRP Report 3* (Hall et al., 2008). Based on the accident/incident location data, two cumulative probability distribution models were developed. With the functions obtained, the fraction of accidents involving locations exceeding a given distance from the runway edge can be estimated. When the probability estimated with the location model is multiplied by the frequency of accident occurrence, it is possible to quantify the overall frequency of incidents involving locations exceeding a given distance from the runway edge.

Figure 19 shows the runway edge origin location used to represent veer-off incidents. The reference location of the aircraft is its nose wheel. The y-axis origin is the edge of the runway, not necessarily the edge of the paved area when the runway has shoulders.

The model structure for the location models is the following:

$$P\{Location > y\} = e^{-by^m}$$

where

$P\{Location > y\}$ is the probability that the veer-off distance from the runway edge is greater than y,

Table 9. Average veer-off incident rates (1982–2009).

Type of Incident	Number of Incidents	Incident Rate per Operation	Incident Rate in Operations per Incident
LDVO	512	1.195E-06	837,000
TOVO	111	2.590E-07	3,861,000

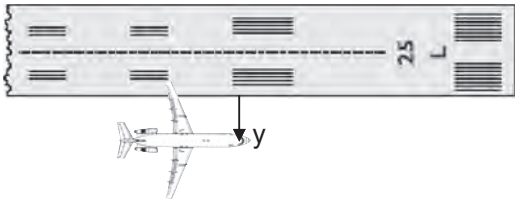


Figure 19. Y origin for aircraft veer-offs.

y is a given location or distance from the runway edge, and *b* and *m* are regression coefficients.

A typical transverse location distribution is presented in Figure 20.

The actual model parameters are presented in Table 10 and illustrated in Figures 21 and 22.

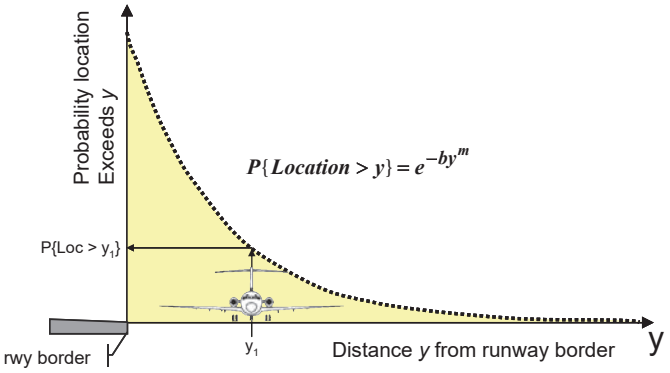


Figure 20. Typical model for aircraft veer-offs.

Table 10. Summary of veer-off location models.

Type of Accident	Type of Data	Model	R^2	# of Points
LDVO	Y	$P\{d > y\} = e^{-0.02568 y^{0.803946}}$	99.5%	126
TOVO	Y	$P\{d > y\} = e^{-0.01639 y^{0.863461}}$	94.2%	39

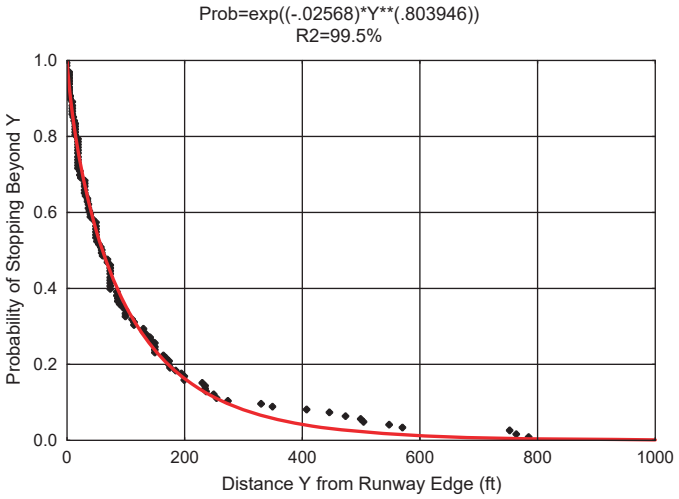


Figure 21. Location model for landing veer-off.

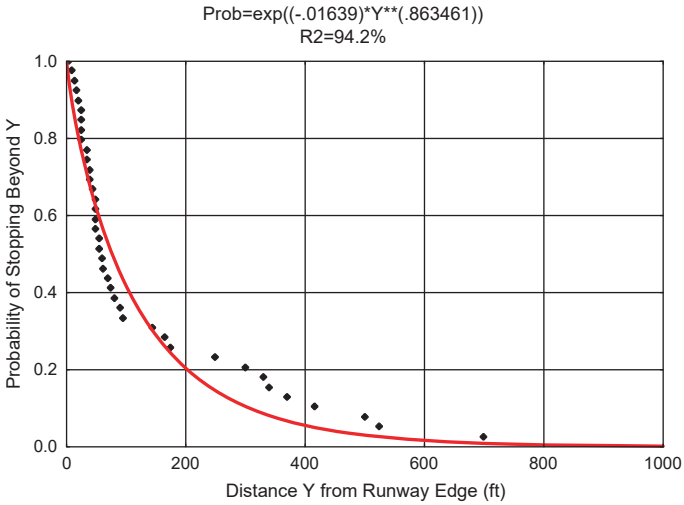


Figure 22. Location model for takeoff veer-off.

CHAPTER 5

Validating the Methodology

MOS Case Studies

One of the goals of this study was to evaluate the types of justification used by airports when submitting MOS requests to the FAA, specifically when the non-compliance issue was related to airfield separation. A second objective was to test and validate the methodology applied to those cases to evaluate how the new methodology might help support such requests. To achieve these objectives, a survey was conducted of airports with MOS for airfield separations that have been approved by the FAA.

MOS Survey

The Airports Division of the FAA regional offices were contacted to obtain a list of airports that have received MOS approvals related to airfield separations. Fifty-nine cases were identified for which some information was available. Out of those cases approved by the FAA, 20 were selected to cover various regions and the spectrum of National Plan of Integrated Airport Systems (NPIAS) categories. The airports were characterized according to geographic region, aircraft operations, fleet mix, airport reference code, and NPIAS classification. The list of MOS cases selected for this study is shown in Table 11. More details about each case are presented in Appendix H.

Methodology Applied to MOS Cases

To validate the methodology and the models developed in this study, the analysis procedures presented in Appendix A were applied to each of the 20 selected MOS cases. A summary of results is presented in Table 12. For each case, the following information is provided:

- The non-standard situation and the compliance standards;
- The analysis of the separation using the risk analysis methodology;
- Comparison of estimated and historical incident/accident rates, when available; and
- Major conclusions on risk level and acceptance.

Additional details for each analysis are presented in Appendix H. The following describes the information contained in each column of Table 12:

- **Airp.**—FAA code of the airport.
- **ADG**—Aircraft Design Group that defines the separation.
- **Type of MOS**—Type of procedure used in the analysis.
- **Risk Level**—Probability for risk severity considered. Catastrophic consequences were considered for every analysis involving runway separation, and major consequences were considered for the remaining cases. The definitions for severity and likelihood classifications are based on the FAA risk matrix (FAA, 2010)
- **Expected # Yrs**—Number of years that an accident is expected to occur.
- **Risk < 1.0E-7**—Yes, if risk is lower than 1 in 10 million operations.
- **Risk < 1.0E-9**—Yes, if risk is lower than 1 in 1 billion operations.
- **Expected Severity**—Worst credible consequence expected for the accident, based on categories defined in the FAA risk matrix (FAA, 2010).
- **FAA Risk Classification**—Level of risk according to classification based on FAA risk matrix (FAA, 2010).
- **Acceptable**—Yes, if level of risk is medium or low; however, for medium risk, measures to mitigate and control may be necessary.

Figures 23 and 24 present a summary of the most frequent justifications and restrictions, respectively, when submitting MOS requests related to airfield separations.

As observed in Table 12, the methodology would help support the analysis of MOS. With the exception of one case,

Table 11. Airports included in the MOS survey.

ase #	Airport	ID	NPIA [1]	MO Type[2]	FAA Re ion
1	Philadelphia, PA	PHL	LH	TWY/TWY	AEA
2	Anchorage, A	ANC	MH	TWY /OBJ	AAL
3	Addison, TX	ADS	RL	RWY/TWY	ASW
4	Bridgeport, CT	BDR	GA	RWY/TWY	ANE
5	Accomack, VA	MFV	GA	RWY/OBJ	AEA
6	Lincoln Park, NJ	N07	RL	TLN /OBJ	AEA
7	New York JF , NY	JF	LH	TWY/TWY	AEA
8	Newark, NJ	EWR	LH	TWY/TWY	AEA
9	Minneapolis, MN	MSP	LH	TWY/TWY	AGL
10	Chicago, IL	ORD	LH	TWY/TWY	AGL
11	Chicago, IL	ORD	LH	TWY/OBJ	AGL
12	Barnstable, MA	HYA	NH	RWY/TWY	ANE
13	Laconia, NH	LCI	GA	RWY/TWY	ANE
14	Seattle-Tacoma, WA	SEA	LH	RWY/TWY	ANM
15	Seattle-Tacoma, WA	SEA	LH	TWY/TWY	ANM
16	Aspen, CO	ASE	NH	RWY/OBJ	ANM
17	Nantucket, MA	AC	NH	TWY/TWY	ANE
18	New Castle, DE	ILG	GA	TWY/TWY	AEA
19	Leesburg, VA	JYO	RL	RWY/OBJ	AEA
20	Taunton, MA	TAN	GA	RWY/TWY	ANE

[1] National Plan of Integrated Airport Systems (NPIAS) Classification
LH: Primary, Large Hub
MH: Primary, Medium Hub
SH: Primary, Small Hub
NH: Primary, Non-Hub
RL: Reliever
GA: General Aviation

[2] MOS Type
RWY/TWY: runway to taxiway separation
TWY/TWY: taxiway to taxiway separation
TWY/TLN: taxiway to taxilane separation
TWY/OBJ: taxiway to object separation
TLN/TLN: taxilane to taxilane separation
TLN/OBJ: taxilane to object separation
RWY/OBJ: runway to object separation

[3] FAA Regions with Relevant MOS Cases
AEA: Eastern
AAL: Alaska
ASW: Southwest
ANE: New England
AGL: Great Lakes
ANM: Northwest Mountain

the analysis results provided an insight into the quantitative risk associated with each case. Moreover, the results helped identify the level of risk and consequently the need to include additional measures to control risk.

The cases with low levels of risk are satisfactory without additional measures, except to keep the conspicuity of taxiway and taxilane centerlines under any weather conditions.

Based on these results, some important conclusions can be drawn:

- The suggested level of risk criterion for taxiway/taxilane/object separations is one accident in 10 million movements. This criterion was met for each of the case studies that does not involve runway separations. This is also the maximum risk for the range defined in the FAA risk matrix for accidents of major severity, the worst credible consequence for taxiway/taxilane collisions (FAA, 2010).
- The same criterion is suggested to evaluate runway separations because it was the basis for defining design standards using the FAA/ICAO CRM. It should be noted that the most credible consequence for aircraft veering off a runway is catastrophic. As such, the acceptable risk level is one accident in 1 billion operations, and according to the FAA, the risk is classified as medium.
- The FAA also added criteria specific for airports, and the maximum risk for accidents of major consequences is one in every 2.5 million departures or 4×10^{-7}; however, based on the results of the analysis using the risk methodology, a more conservative level may be used, and a level of one accident in 10 million operations for cases involving taxiway/taxilane/object is recommended.

Table 12. Summary of results for MOS case studies.

Airp	ADG	Type of MO	Ris Le el	pected # rs	Ris 1	Ris 1	pected e erity	FAA Ris lassification	Acceptable
PHL	III IV	Taxilane/Taxilane	1.0E-9	N/A	Yes	Yes	Major	Low	Yes
ANC	VI	Taxiway/Object	1.0E-9	N/A	Yes	Yes	Major	Low	Yes
ADS	III	Runway/Taxiway	1.0E-7	> 100	Yes	No	Catastrophic	Medium	Yes
BDR	II	Runway/Taxiway	1.1E-7	> 100	No	No	Catastrophic	Medium	Yes
MFV	II	Runway/Object	5.9E-8	> 100	Yes	No	Catastrophic	Medium	Yes
N07	I	Taxilane/Object	1.2E-9	N/A	Yes	No	Major	Low	Yes
JF	VI	Taxiway/Taxiway	1.0E-9	N/A	Yes	Yes	Major	Low	Yes
EWR	V	Taxiway/Taxiway	1.0E-9	N/A	Yes	Yes	Major	Low	Yes
		Taxilane/Object	1.0E-9	N/A	Yes	Yes	Major	Low	Yes
MSP	IV	Taxiway/Taxiway	1.0E-9	N/A	Yes	Yes	Major	Low	Yes
ORD	V	Taxiway/Object	1.0E-9	N/A	Yes	Yes	Major	Low	Yes
ORD	V	Taxiway/Taxiway	1.0E-9	N/A	Yes	Yes	Major	Low	Yes
HYA	III	Runway/Taxiway	8.8E-8	> 100	Yes	No	Catastrophic	Medium	Yes
LCI	III	Runway/Taxiway	2.0E-7	> 100	No	No	Catastrophic	Medium	Yes
SEA	VI	Runway/Taxiway	1.6E-6	N/A	No	No	Catastrophic	High[1]	No[1]
SEA	VI	Taxiway/Taxilane	1.0E-9	N/A	Yes	Yes	Major	Low	Yes
ASE	III	Runway/Taxiway	9.0E-8	> 100	Yes	No	Catastrophic	Medium	Yes
AC	III	Taxiway/Taxiway	1.0E-9	N/A	Yes	Yes	Major	Low	Yes
ILG	IV	Taxiway/Object	2.8E-8	N/A	Yes	No	Major	Low	Yes
JYO	II	Runway/Taxiway	1.2E-7	> 100	No	No	Catastrophic	Medium	Yes
TAN	II	Runway/Taxiway	8.0E-8	> 100	Yes	No	Catastrophic	Medium	Yes

[1]MOS approval conditions by the FAA restrict the use of the taxiway under specific conditions to avoid the situation of high risk.

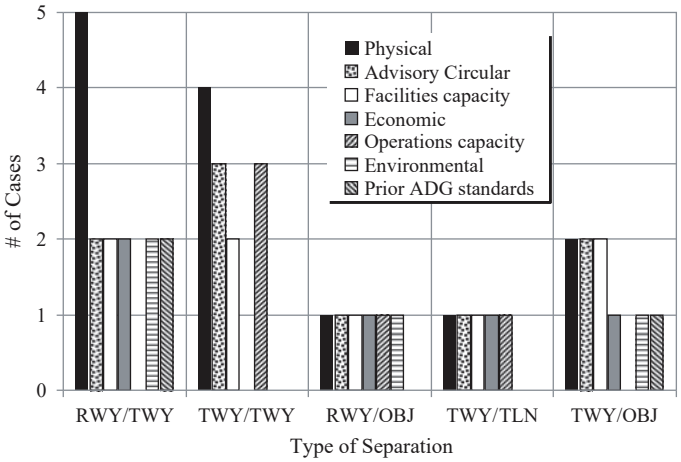


Figure 23. Most common justifications for MOS of airfield separations.

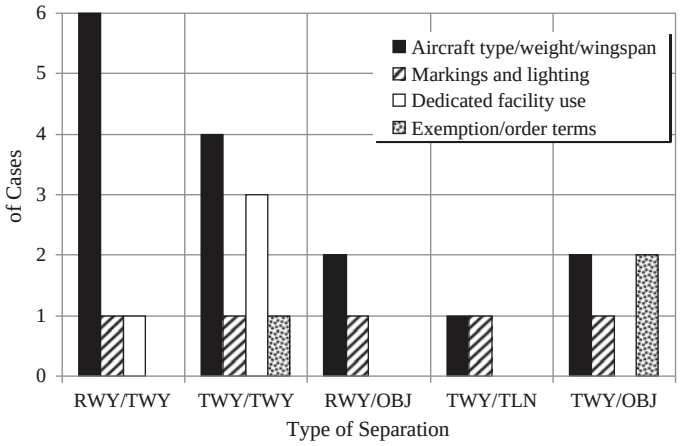


Figure 24. Most common restrictions for MOS of airfield separations.

CHAPTER 6

Conclusions and Recommendations

The aviation industry is relatively young compared to other industries. Over the past 100 years, rapid technological changes have had a substantial impact on airfield configuration and design standards. Airfield standards have been modified to improve safety and to accommodate new technology to improve airport capacity and maintain acceptable safety levels. When the standards are changed to require larger areas and dimensions, existing airports increasingly find themselves constrained by land development and other natural features.

Another common situation occurring with airports is the need to have larger aircraft operating at the airport to increase capacity. In this case, the new aircraft may belong to a higher ADG, and the corresponding standards may be different and require larger airfield separations.

The methodology developed in this study provides a practical and simple tool to help airports quantify and evaluate risk if they cannot comply with the standards and want to pursue an MOS to submit to the FAA. The methodology is based on lateral deviation studies and models developed in this research as well as in previous studies conducted by the FAA, Boeing, and ICAO. A comprehensive survey of accidents and incidents associated with lateral deviations during landing, takeoff, and taxiing operations was conducted to identify causal and contributing factors, as well as to characterize the lateral deviation during those events.

Major Achievements

Airfield Separation Rationale to Develop Standards

It is simple to understand the need for airfield separations to avoid aircraft collisions. However, the rationale used by the FAA and ICAO to establish existing standards is not readily available in the literature. This study gathered the information available from FAA and ICAO personnel who were involved in the development or in the management of those standards. The information presented in Chapter 2 herein can be very helpful to the industry and provides documentation that may be used for reference in future studies.

Development of Veer-off Accidents and Incidents Database

A comprehensive worldwide database of aircraft veer-off accidents and incidents was developed that contains information gathered from existing accident and incident databases and information obtained from other sources (e.g., weather data). The database was developed in Microsoft Access, which provides editing and querying capabilities. The database contains a synopsis of the event, date, location, runway characteristics, characteristics of the aircraft involved, causal factors, consequences, and wreckage location/path data.

Development of Risk Models for Runway Veer-Offs

Risk models for aircraft veer-off during takeoff and landing operations were developed using an approach similar to that presented in *ACRP Report 3* for overruns and undershoots (Hall et al., 2008). A two-part model based on the probability of an incident occurring and an estimate of the probability that the aircraft will travel beyond a given distance from the runway edge is used to assess the risk that an aircraft may depart the existing safety areas.

The frequency model is based on operational and weather factors, including a criticality factor that related aircraft performance under given conditions with the available distance for operation. The frequency model uses accident, incident, and normal operations data to quantify accident risk factors and provide an assessment of flight risk exposure.

Development of a Tool to Analyze Airfield Separations

An analysis process for each type of airfield separation is presented in Appendix A. The procedures are simple to use, and the instructions include practical examples to help the user.

The methodology serves as a screening tool to support MOS requests involving airfield separations when the standards cannot be met. The process helps to quantify the risk levels for non-standard conditions and, based on criteria recommended in this report, in agreement with the FAA risk matrix, it is possible to evaluate the feasibility of approval of an MOS request (FAA, 2010).

Different procedures are provided depending on the type of airfield separation. It is possible to analyze separations involving runways, taxiways, taxilanes, and objects. A specific approach was used for each type of separation. To facilitate the application of the methodology, risk plots are presented for each ADG, and when the analysis involves specific aircraft, risk plots based on wingtip clearance are provided.

Recommended Risk Criteria for Taxiway and Taxilane Separations

An extensive survey of historical taxiway and taxilane incidents helped assess the major factors involved in these events. Due to the slow speeds of aircraft on taxiways and taxilanes as compared to aircraft speeds on runway operations, even under adverse weather conditions or slippery pavements, the pilot was able to stop the aircraft as soon as it departed the paved surface of the taxiway. Further, historical taxiway collision events were not related to taxiway deviations. In almost every accident/incident, the collision occurred because there was another aircraft or movable object inside the OFA of the taxiing aircraft.

One major conclusion is that the existing standards provide an excellent level of safety and that the risk is lower than one accident in 1 billion operations. Even when another aircraft or object was in the path, resulting in a collision, there has never been a serious injury associated with the accidents, and the damages have been limited mostly to the wingtip of the aircraft.

Based on the available evidence, the worst credible consequence for a taxiway or taxilane according to the FAA risk matrix is major damage to aircraft and/or minor injury to passengers/workers, major unplanned disruption to airport operations, or serious incident (FAA, 2010). For major consequences, the maximum acceptable level of likelihood is "remote." In this case, a remote event is expected to occur once every year or 2.5 million departures, whichever occurs sooner.

Limitations

The methodology developed in this study has some limitations. Risk of collision between two aircraft, or an aircraft and an object, estimated with this methodology is applicable only to straight parallel segments of taxiways and taxilanes.

Although the lateral deviation data in taxiing operations used to develop the risk plots were measured only for the B-747 aircraft, it is assumed that smaller aircraft have lateral deviation distributions that have smaller ranges. Thus, the model can be considered conservative when applied to smaller aircraft. However, the taxiway deviation models used in this study were developed from lateral deviation data collected on taxiways with centerline lights. Therefore, the conspicuity of the taxiway/taxilane centerline is an added risk mitigation measure that should be used when justifying an MOS request.

The FAA/ICAO CRM during missed approach was developed based on data for two- and three-engine jet airplanes. The veer-off models developed under this study are based on data from veer-off accident/incident reports taken from several countries and for aircraft with MTOW larger than 5,600 lb.

The collision risk during the approach phase of landing is modeled for missed approach during instrument approaches under Cat I and II. This is assumed to be the highest risk condition, and the phase when the pilot is under visual conditions is not modeled in the risk curves presented.

CRM risk is estimated for an aircraft located on the centerline of a parallel taxiway. The taxiing aircraft is of the same ADG as the approaching aircraft, and the maximum tail height for the ADG is taken to characterize the obstacle located in the taxiway. The same plots may be used to assess risks associated with other types of obstacles at a certain distance from the runway centerline; however, such obstacles must be lower than the maximum tail height of the ADG used to develop the charts.

Recommendations for Future Work

Effort to Collect Taxiway/Taxilane Deviation Data

As described in previous sections of this report, many of the separation standards were developed during World War II and were based on engineering judgment. These standards have helped maintain very high levels of safety, as evidenced by the fact that there is no history of collisions between two aircraft taxiing in parallel routes.

With the increase in traffic volume and the need to increase airport capacity, many airports are restricted in their ability to increase existing airfield separations to introduce operation of larger aircraft. Although the FAA permits MOS based on formulas developed for this purpose, the formulas were developed based on engineering judgment, rather than using a probability approach.

Recent FAA studies on aircraft deviation for large aircraft have demonstrated the feasibility of collecting data to develop risk models. However, these studies have focused on large aircraft on taxiway segments with centerline lights. There is a need to collect additional data for various categories of aircraft, for both taxiway and taxilane segments, under various environmental conditions, with and without conspicuous centerline markings, and with and without centerline lights.

Such studies should not be undertaken to modify the current standards, but they can support MOS processes when the evaluation of shorter-than-standard distances is necessary.

Effort to Collect Aircraft Deviation Data during Landing and Takeoff Operations

The development of risk plots for the airborne phase of landing used the FAA/ICAO CRM for instrument approach Cat I and II. The CRM model was based on the limited data available at the time it was developed. Aircraft technology and navigational aids have improved significantly since then. As it is expected that airport capacity will need to increase two- or threefold in the near future, it is necessary to develop a more rational approach to more accurately assess the level of safety. Many airports still rely on visual and non-precision approaches, and for these categories, that analysis can be made only by using Part 77 imaginary surfaces obstruction evaluation to obtain a very basic assessment of risk.

A risk-based model for the assessment of visual segment or non-precision approaches would benefit many airports in the United States and abroad, particularly for the evaluation of airfield areas. Therefore, studies that address risk assessment for aircraft operations associated with movable or fixed objects within or in the vicinity of airports would greatly benefit the aviation industry.

Glossary of Acronyms

AAIB	UK Air Accidents Investigation Branch
AAIU	Ireland Air Accident Investigation Unit
AC	Advisory Circular
ADG	Aircraft Design Group
AIDS	FAA Accident/Incident Data System
ANC	Ted Stevens Anchorage International Airport
AOSC	Airport Obstructions Standards Committee
ARC	Airport Reference Code
ARCP	Aerodrome Reference Code Panel
ASPM	Aviation System Performance Metrics
ASRS	FAA/NASA Aviation Safety Reporting System
ATSB	Australian Transport Safety Bureau
BEA	Bureau d'Enquêtes et d'Analyses pour la Sécurité de l'Aviation Civile
CAA	Civil Aeronautics Administration
CG	Center of Gravity
CIAIAC	Comisión de Investigación de Accidentes e Incidentes de Aviación Civil (Spain)
CRM	Collision Risk Model
ETMSC	Enhanced Traffic Management System Counts
FAAP	Federal Aid Airport Program
FAR	Federal Aviation Regulation
FHA	Functional Hazard Analysis
GA	General Aviation
ICAO	International Civil Aviation Organization
IFALPA	International Federation of Airline Pilots' Associations
ILS	Instrument Landing System
ISO	International Organization for Standardization
JFK	John F. Kennedy International Airport
LDVO	Landing Veer-off
MOS	Modification of Standards
MTOW	Maximum Takeoff Weight
NAS	National Airspace System
NASA	National Aeronautics and Space Administration

NASB	Netherlands Aviation Safety Board
NLA	New Large Aircraft
NOAA	National Oceanic and Atmospheric Administration
NOD	Normal Operations Data
NPIAS	National Plan of Integrated Airport Systems
NTSC	National Transportation Safety Committee (Indonesia)
OCH	Obstacle Clearance Height
OCP	Obstacle Clearance Panel
OFA	Object Free Area
OFZ	Obstacle Free Zone
RESA	Runway End Safety Area
ROC	Receiver Operating Characteristic
RSA	Runway Safety Area
SARP	Standard and Recommended Practice
TAIC	New Zealand Transport Accident Investigation Commission
TERP	Terminal Instrument Procedures
TOVO	Takeoff Veer-Off
TSB	Transportation Safety Board of Canada
USACE	United States Army Corps of Engineers

Definitions

Acceptable Level of Risk. For regulations and special permits, the acceptable levels of risk are established by consideration of risk, cost/benefit, and public perception.

Accident. An unplanned event or series of events that results in death, injury, damage to, or loss of, equipment or property.

Consequence. The direct effect of an event, incident, or accident. In this study, it is expressed as a health effect (e.g., death, injury, exposure) or property loss.

Hazard. The inherent characteristic of a material, condition, or activity that has the potential to cause harm to people, property, or the environment.

Hazard Analysis. The identification of system elements, events, or material properties that lead to harm or loss. The term "hazard analysis" may also include evaluation of consequences from an event or incident.

Incident. A near-miss episode, malfunction, or failure without accident-level consequences that has a significant chance of resulting in accident-level consequences.

Likelihood. Expressed as either a frequency or a probability. Frequency is a measure of the rate at which events occur over time (e.g., events/year, incidents/year, deaths/year). Probability is a measure of the rate of a possible event expressed as a fraction of the total number of events (e.g., 1 in 10 million, 1/10,000,000, or $1 \times 10\text{-}7$).

METAR. Aviation routine weather report.

Nonconformity. Non-fulfillment of a requirement. This includes, but is not limited to, non-compliance with federal regulations. It also includes an organization's requirements, policies, and procedures, as well as requirements of safety risk controls developed by the organization.

Quantitative Risk Analysis. Incorporates numerical estimates of frequency or probability and consequence.

Risk. The combination of the likelihood and the consequence of a specified hazard being realized. It is a measure of harm or loss associated with an activity.

Risk Analysis. The study of risk in order to understand and quantify risk so it can be managed.

Risk Assessment. Determination of risk context and acceptability, often by comparison to similar risks.

Safety. Freedom from unacceptable risk. Often, safety is equated with meeting a measurable goal, such as an accident rate that is less than an acceptable target. However, the absence of accidents does not ensure a safe system. To remain vigilant regarding safety, it is necessary to recognize that just because an accident has not happened does not mean that it cannot or will not happen.

Safety Risk Management. The systematic application of policies, practices, and resources to the assessment and control of risk affecting human health and safety and the environment. Hazard, risk, and cost/benefit analysis are used to support the development of risk reduction options, program objectives, and prioritization of issues and resources. A critical role of the safety regulator is to identify activities involving significant risk and to establish an acceptable level of risk.

Veer-Off. An aircraft running off the side of the runway during takeoff or landing roll.

Worst Credible Condition. The most unfavorable condition or combination of conditions that it is reasonable to expect will occur.

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APPENDIX A

Risk Assessment Methodology

CONTENTS

How to Use This Methodology, A-2
Limitations, A-2
Risk Criteria, A-3
Section 1 Taxiway to Taxiway or Taxiway to Taxilane, A-5
Section 2 Taxiway to Object, A-5
Section 3 Taxilane to Taxilane, A-7
Section 4 Taxilane to Object, A-8
Section 5 Runway to Taxiway, Taxilane, or Object, A-8
Attachment—Risk Plots, A-13

How to Use This Methodology

This methodology is intended to serve as a screening tool for analysis associated with requests for modification of standards (MOS) related to airfield separations. In no case should this methodology be used to justify changes to current FAA design standards for airfields. Conclusions drawn based on this methodology shall be subject to further analysis and approval by the FAA before the non-standard separation is adopted. Additional mitigating procedures and risk control measures may be required to achieve an acceptable level of safety for operations in the airfield.

This appendix provides a step-by-step methodology to evaluate the risk of aircraft collision associated with airfield separations in parallel segments. The methodology uses information on existing or planned conditions and provides estimates of risk. The level of risk should be compared to acceptable levels of risk recommended by the FAA.

Different procedures are used depending on the type of analysis desired, as explained in ensuing sections. The methodology is divided into five basic sections, and each section presents the procedure to assess the risk for a specific scenario.

The outcome of the analysis is the risk of collision between two aircraft or between an aircraft and an object, depending on the type of analysis required. To determine the appropriate section containing the methodology and step-by-step procedure for the desired type of analysis, the two types of structures must be selected from Table A-1. For example, to analyze the separation between a taxiway and an object, the user should use the procedure described in Section 2 and the risk plots presented in Figures AA-8 to AA-14 presented in the attachment to Appendix A.

When describing the procedure, some acronyms are used to characterize specific parameters. Definitions of these acronyms can be found within the section in which they appear. When an equation is included in the procedure, a number located in parenthesis to the right of it is used to reference the equation in the text.

Many of the risk plots presented in this methodology should be used for specific Aircraft Design Groups (ADGs) as defined in FAA Advisory Circular (AC) 150/5300-13 (FAA, 1989).

Table A-2. Airplane Design Groups (FAA, 1989).

Group #	Tail ei t ft	in span ft
I	20	49
II	20 to 30	49 to 79
III	30 to 45	79 to 118
IV	45 to 60	118 to 171
V	60 to 66	171 to 214
VI	66 to 80	214 to 262

Table A-2 presents a summary of tail height and wingspan ranges for each ADG.

As mentioned earlier, the outcome of the analysis is the risk of collision. Both the FAA and the International Civil Aviation Organization (ICAO) have been using a collision risk value of one in 10 million operations (1×10^{-7}) as the acceptable level during the approach phase under instrument conditions. This is also the level criterion suggested when applying this methodology.

Limitations

This methodology should be used carefully, and the user must be aware of its limitations. This methodology can be applied to estimate the risk of collision between two aircraft or an aircraft and an object only on straight parallel segments of taxiways and taxilanes. Also, because the taxiway deviation models used in this study were developed from lateral deviation data collected on taxiways with centerline lights, the conspicuity of the taxiway/taxilane centerline is an added risk mitigation measure that should be used when justifying an MOS request for separations that do not include runways.

Although lateral deviation data in taxiing operations used to develop the risk plots were measured only for the B-747 aircraft, it is assumed that smaller aircraft have lateral deviation distributions that have smaller ranges. Thus, the model applied can be considered conservative when applied to smaller aircraft.

The FAA/ICAO Collision Risk Model (CRM) during missed approach was developed based on data for two- and three-engine jet airplanes. The veer-off models developed under this

Table A-1. Procedure selection.

	Ta i ay	Ta ilane	Run ay
Ta i ay	Section 1 (Figures AA-1 to AA-7)	Section 1 (Figures AA-1 to AA-7)	Section 5 (Figures AA-29 to AA-54)
Ta ilane	Section 1 (Figures AA-1 to AA-7)	Section 3 (Figures AA-15 to AA-21)	Section 5 (Figures AA-29 to AA-54)
Object	Section 2 (Figures AA-8 to AA-14)	Section 4 (Figures AA-22 to AA-28)	Section 5 (Figures AA-29 to AA-54)

ACRP study are based on data from veer-off accident/incident reports taken from several countries and for aircraft with maximum takeoff weight (MTOW) larger than 5,600 lb.

The collision risk during the approach phase of landing is modeled for missed approach during instrument approaches under Cat I and II. This is assumed to be the highest risk condition, and the phase when the pilot is under visual conditions is not modeled in the risk curves presented.

CRM risk is estimated for an aircraft located on the centerline of a parallel taxiway. The taxiing aircraft is of the same ADG as the approaching aircraft, and the maximum tail height for the ADG is taken to characterize the obstacle located in the taxiway. The same plots may be used to assess risks associated with other types of obstacles at a certain distance from the runway centerline; however, such obstacles must be lower than the maximum tail height of the ADG used to develop the charts.

Risk Criteria

The suggested risk criteria to use with this methodology are those used by the FAA and represented by the risk matrix shown in Figure A-1 (FAA, 2010). A risk classification (high, medium, or low) is provided based on the combination of severity and likelihood.

Severity is the measure of how bad the results of an event are predicted to be and is defined as the worst credible consequence that may take place for risk associated with a given hazard. Likelihood should be considered only after determining severity, and at the same time, likelihood should not be considered when determining severity.

Definitions for each level of severity and consequence are presented in Tables A-3 and A-4.

Two cases can serve as examples: (1) risk of collision between an aircraft landing and an aircraft located in a parallel taxiway and (2) risk of wingtip collision between aircraft taxiing in parallel taxiways. The first step is to determine the worst credible consequence for each of these events. The worst credible consequence for runway veer-offs in most cases is hull loss and multiple fatalities, which is classified as catastrophic. According to the FAA risk matrix, such a condition is acceptable only if it occurs less than once every 100 years or less than once in 25,000,000 departures.

For the second case, based on historical data of accidents and incidents, the worst credible consequence may be classified as major. In this case, the risk is acceptable if it is expected to occur about once every year or every 2.5 million departures (4×10^{-7}), whichever occurs sooner.

The ICAO Obstacle Clearance Panel (OCP) has set the acceptable risk of collision during the approach phase at a value of one in 10 million operations (1×10^{-7}). Since this is the risk level used to establish most of the airfield design standards defined by the FAA, and this methodology will serve as a screening tool, this criterion is used in this screening methodology. However, the risk classification based on the risk matrix defined by the FAA must be highlighted when submitting MOS for FAA approval (FAA, 2010).

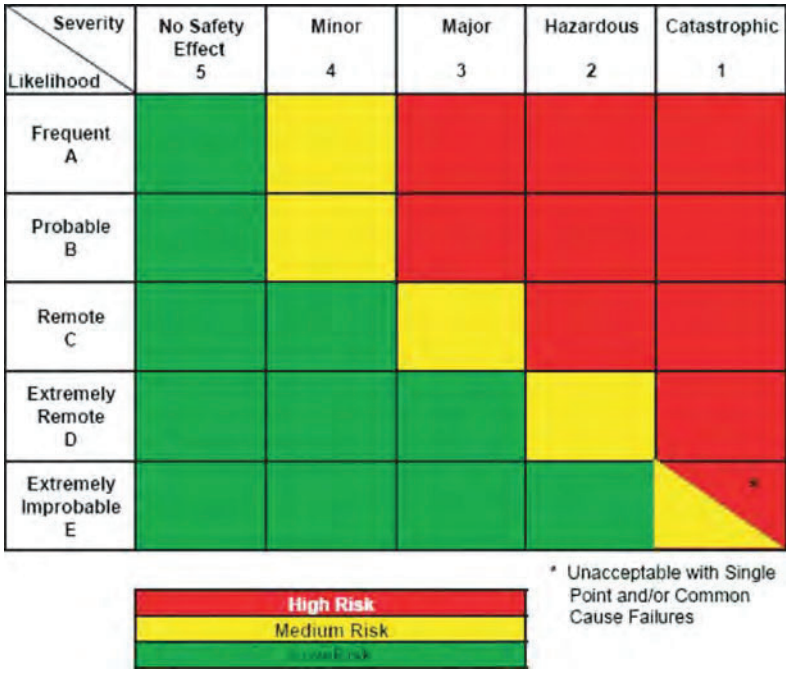


Figure A-1. FAA risk matrix (FAA, 2010).

Table A-3. FAA likelihood levels (FAA, 2010).

	General	Airport pecific	AT Operational	
			Per Facility	NA ide
Fre uent A	Probability of occurrence per operation is equal to or greater than 1 10^{-3}	Expected to occur more than once per week or every 2,500 departures (4 10^{-4}), whichever occurs sooner	Expected to occur more than once per week	Expected to occur every 1–2 days
Probable	Probability of occurrence per operation is less than 1 10^{-3}, but equal to or greater than 1 10^{-5}	Expected to occur about once every month or 250,000 departures (4 10^{-6}), whichever occurs sooner	Expected to occur about once every month	Expected to occur several times per month
Remote	Probability of occurrence per operation is less than 1 10^{-5} but equal to or greater than 1 10^{-7}	Expected to occur about once every year or 2.5 million departures (4 10^{-7}), whichever occurs sooner	Expected to occur about once every 1–10 years	Expected to occur about once every few months
tremely Remote D	Probability of occurrence per operation is less than 1 10^{-7} but equal to or greater than 1 10^{-9}	Expected to occur once every 10–100 years or 25 million departures (4 10^{-8}), whichever occurs sooner	Expected to occur about once every 10–100 years	Expected to occur about once every 3 years
tremely Improbable	Probability of occurrence per operation is less than 1 10^{-9}	Expected to occur less than once every 100 years	Expected to occur less than once every 100 years	Expected to occur less than once every 30 years

Note: Occurrence is defined per movement.

Table A-4. FAA severity definitions (FAA, 2010).

a ard e erity lassification				
Minimal	Minor	Major	a ardous 2	atastrop ic 1
No damage to aircraft but minimal injury or discomfort of little consequence to passenger(s) or workers	- Minimal damage to aircraft; - Minor injury to passengers; - Minimal unplanned airport operations limitations (i.e. taxiway closure); - Minor incident involving the use of airport emergency procedures	- Major damage to aircraft and/or minor injury to passenger(s)/ worker(s); - Major unplanned disruption to airport operations; - Serious incident; - Deduction on the airport s ability to deal with adverse conditions	- Severe damage to aircraft and/or serious injury to passenger(s)/ worker(s); - Complete unplanned airport closure; - Major unplanned operations limitations (i.e. runway closure); - Major airport damage to equipment and facilities	- Complete loss of aircraft and/or facilities or fatal injury in passenger(s)/ worker(s); - Complete unplanned airport closure and destruction of critical facilities; - Airport facilities and equipment destroyed



Figure A-2. Example of taxiway/taxiway separation analysis for specific aircraft.

Section 1—Taxiway to Taxiway or Taxiway to Taxilane

Procedure to Estimate Risk of Collision

1. Identify the taxiways and the centerline separation to be evaluated.
2. Identify the ADG for analysis or the aircraft with the largest wingspan that will be using each taxiway. It is possible that each taxiway is assigned to a different ADG or specific aircraft.
3. If the assessment is for a specific ADG, the simplified collision risk plots can be used based only on the taxiway centerline separation (Figures AA-1 to AA-6 in the attachment to this appendix).
4. If the risk assessment involves specific aircraft or two different types of aircraft, the wingtip separation chart in Figure AA-7 should be used, and in this case, the following steps will be required:
   a. Place both aircraft at the centerlines of the parallel taxiways (see Figure A-2).
   b. Calculate the wingtip clearance for this situation using Equation 1:

$$WD = CS - (WS1 + WS2)/2 \quad (1)$$

where

WD is the distance between wingtips of the two aircraft when both are positioned at the centerline of the taxiways,

CS is the centerline separation between the parallel taxiways,

*WS*1 is the wingspan for the first aircraft, and
*WS*2 is the wingspan for the second aircraft.

   c. Using Figure AA-7, enter the wingtip separation and estimate the risk.
5. Using the risk level estimated, compare to 1×10^{-7}, the upper probability for risk of major consequences according to the risk matrix recommended by the FAA.

Example 1—Taxiway/Taxiway Separation

An airport is planning to build a new taxiway to accommodate larger capacity. The airport handles aircraft up to ADG V; however, the space available is enough for a taxiway/taxiway centerline separation of only 233 ft, as shown in Figure A-3. The standard separation for ADG V is 267 ft, and an MOS was deemed necessary to demonstrate that the available separation is safe.

For taxiway/taxiway separation involving ADG V, Figure AA-5 is used. Entering the separation of 233 ft, the risk of collision when two ADG V aircraft are taxiing is approximately 2.3 E-08 (see Figure A-4), or one collision in 43,500,000 movements. The risk is lower than 1.0E-07 and therefore it is acceptable.

Section 2—Taxiway to Object

Procedure to Estimate Risk of Collision

1. Identify the taxiway and the object separation to be evaluated.

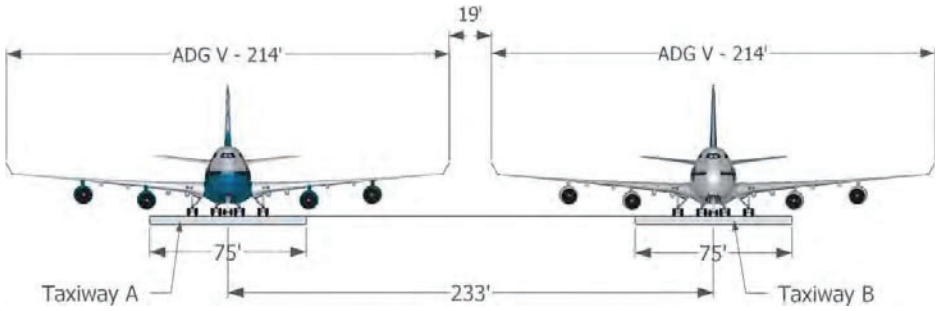


Figure A-3. Example of analysis for taxiway/taxiway separation.

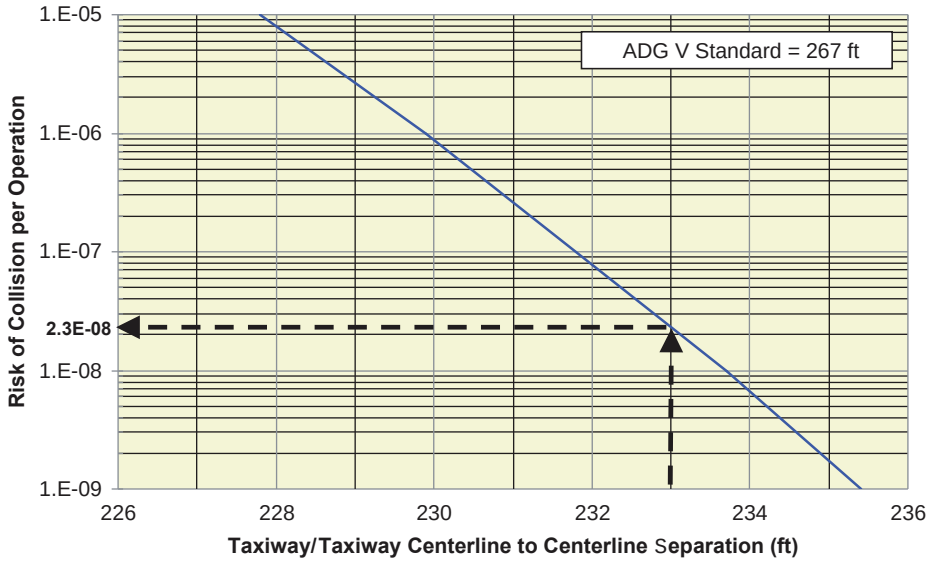


Figure A-4. Example of analysis of taxiway/taxiway separation (ADG V).

2. Identify the ADG for analysis or the aircraft with the largest wingspan that will be using the taxiway.
3. If the assessment is for a specific ADG, the simplified collision risk plots can be used based only on the centerline to object separation (Figures AA-8 to AA-13).
4. If the risk assessment involves a specific aircraft, the wingtip separation plot in Figure AA-14 should be used, and, in this case, the following steps will be required:
   a. Place the aircraft at the taxiway centerline (see Figure A-5).
   b. Calculate the wingtip clearance for this situation:

$$WD = CS - WS/2 \quad (2)$$

where

WD is the distance between the wingtip and the object when the aircraft is positioned at the centerline of the taxiway,

CS is the separation between the taxiway centerline and the object, and

WS is the aircraft wingspan.

   c. Using Figure AA-14, enter the wingtip separation and calculate the collision risk.
5. Compare the risk level estimated to 1×10^{-7}, the highest acceptable probability for risk of major consequences according to the risk matrix recommended by the FAA.

Example 2—Taxiway/Object Separation

An airport is planning to use an existing taxiway for ADG III aircraft; however, it currently is used by ADG II aircraft, and the separation between the taxiway and an existing service road is only 72 ft. The scenario is presented in Figure A-6. The airport does not have space to move the service road because it is limited by the airport perimeter fence. The standard separation for ADG III is 81 ft, and an MOS is necessary to evaluate whether the separation is safe.

For taxiway/object separation involving ADG III, Figure AA-10 is used. Entering the separation of 72 ft, the risk of collision when an ADG III aircraft is taxiing is approximately 1.0E-06 (see Figure A-7), or one collision in 1,000,000 movements. The risk is not acceptable based on the criterion of 1.0E-07; however, it may be possible to evaluate mitigation

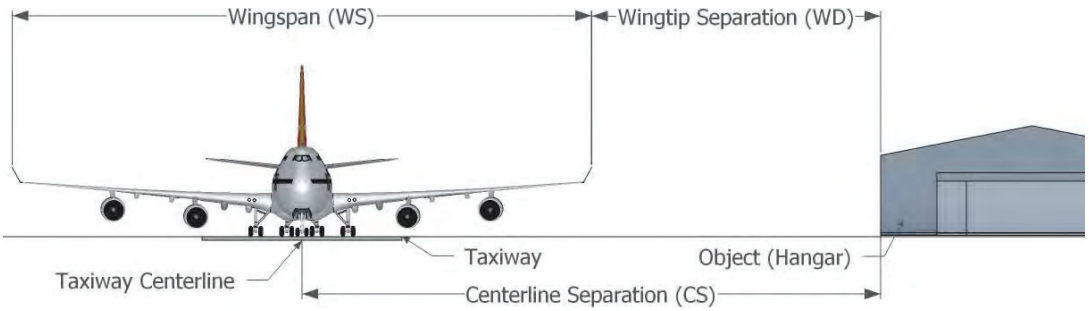


Figure A-5. Example of taxiway/object separation analysis for specific aircraft.

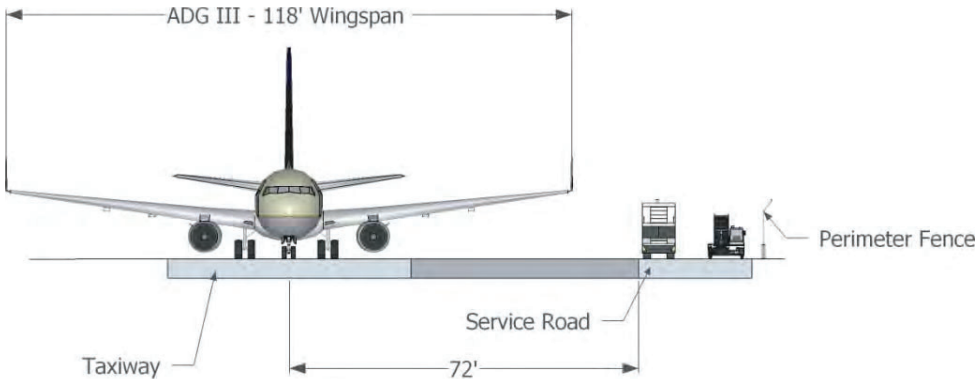


Figure A-6. Example of analysis for taxiway/object separation.

measures (e.g., restricting the wingspan of taxiing aircraft, using centerline lights) or to evaluate the expected number of years for one collision event based on the volume of operations in the taxiway.

For smaller airports with lower volumes of traffic, an accident may be expected to occur less than once every 100 years, and this condition is classified as extremely improbable. In this case, the risk may be considered acceptable according to the criteria suggested by the FAA.

Section 3—Taxilane to Taxilane

Procedure to Estimate Risk of Collision

1. Identify the taxilanes and the centerline separation to be evaluated.
2. Identify the ADG for analysis or the types of aircraft that will be using each taxilane. It is possible that each taxilane is assigned to a different ADG or specific aircraft.
3. If the assessment is for a specific ADG, the simplified collision risk plots can be used based only on the taxilane centerline separations (Figures AA-15 to AA-20).
4. If the risk assessment involves specific aircraft or two different types of aircraft, the wingtip separation plot in Figure AA-21 should be used, and, in this case, the following steps will be required:
   a. Place both aircraft at the centerlines of the parallel taxilanes (see Figure A-8).
   b. Calculate the wingtip clearance for this situation:

$$WD = CS - (WS1 + WS2)/2 \quad (3)$$

where

WD is the distance between wingtips of the two aircraft when both are positioned at the centerline of the taxilanes,
CS is the centerline separation between the parallel taxilanes,
*WS*1 is the wingspan for the first aircraft, and
*WS*2 is the wingspan for the second aircraft.

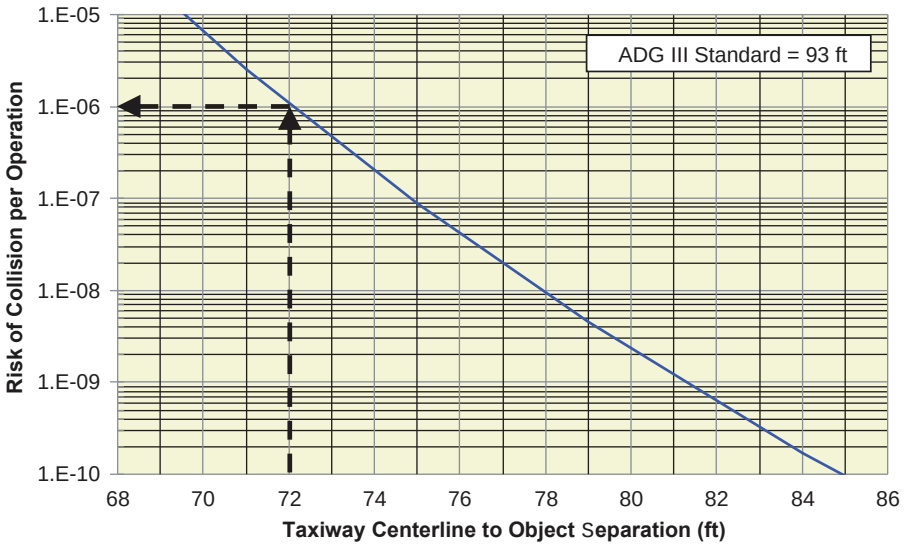


Figure A-7. Example of analysis for taxiway/object separation (ADG III).

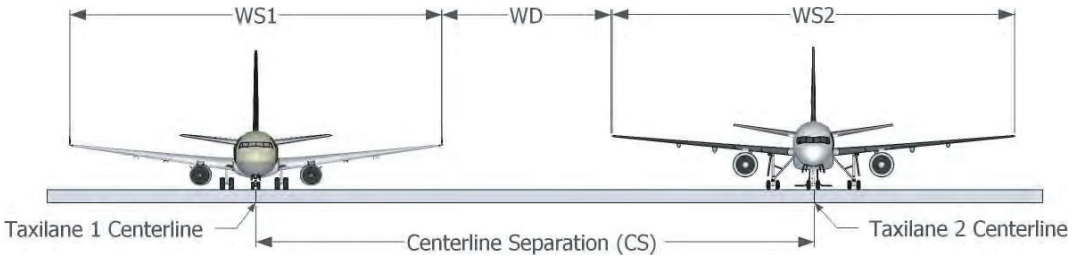


Figure A-8. Example of taxilane/taxilane separation analysis for specific aircraft.

c. Using Figure AA-21, enter the wingtip separation and calculate the risk.

5. Using the risk level estimated, compare to 1×10^{-7}, the upper probability for risk of major consequences according to the risk matrix used by the FAA.

Section 4—Taxilane to Object

Procedure to Estimate Risk of Collision

1. Identify the taxilane and the object separation to be evaluated.
2. Identify the ADG for analysis or the aircraft with the largest wingspan that will be using the taxilane.
3. If the assessment is for a specific ADG, the simplified collision risk plots can be used based only on the taxilane centerline to object separation (Figures AA-22 to AA-27).
4. If the risk assessment involves a specific aircraft, the wingtip separation plot in Figure AA-28 should be used, and, in this case, the following steps will be required:
   a. Place the aircraft at the taxiway centerline (see Figure A-9).
   b. Calculate the wingtip clearance for this situation:

$$WD = CS - WS/2 \quad (4)$$

where:

WD is the distance between the wingtip and the object when the aircraft is positioned at the centerline of the taxilane,

CS is the separation between the taxilane centerline and the object,

WS is the aircraft wingspan.

c. Using Figure AA-28, enter the wingtip separation and calculate the collision risk.

5. Using the risk level estimated, compare to 1×10^{-7}, the upper probability for risk of major consequences according to the risk matrix used by the FAA.

Section 5—Runway to Taxiway, Taxilane, or Object

The runway/taxiway, runway/taxilane, or runway/object separation has two scenarios: takeoff and landing. For landing operations, the analysis is divided into two parts: airborne (approach) phase and ground (landing rollout) phase. For takeoff operations, the analysis considers only the ground (takeoff roll) phase. In most cases, the runways are used for both landing and takeoff operations, and the analysis for takeoff operations will not be necessary because the risk of major lateral deviations during takeoff is lower than the risk during landing.

The airborne collision risk during the approach for landing is characterized using the FAA/ICAO CRM. A series of plots, one for each ADG, was developed to facilitate the use of this methodology.

For the landing ground roll phase, risk plots were derived based on a two-part model: frequency and location. Each plot integrates historical runway veer-off accident/incident rates with veer-off location models to simplify the use of this methodology. Given that the aircraft veered off the runway, the chance that the aircraft deviates more than a certain distance from the runway edge is given by the location model.

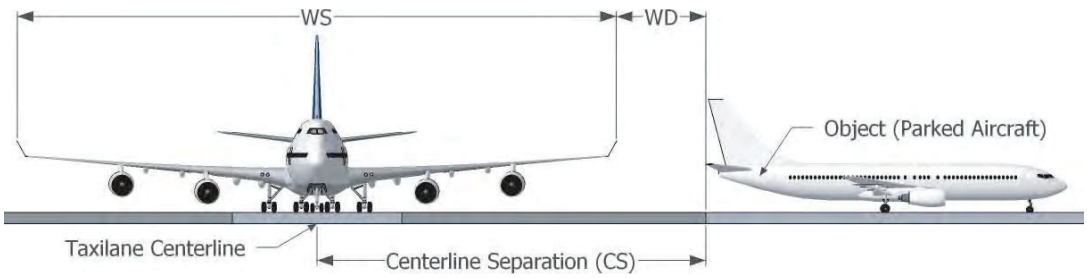


Figure A-9. Example of taxiway/object separation analysis for specific aircraft.

Table A-5. Average probability of occurrence by type of incident (U.S. data—1982 to 2009).

Type of Incident	Probability
Landing veer-off (LDVO)	1 per 837,002 landings
Takeoff veer-off (TOVO)	1 per 3,860,665 takeoffs

The combination of the frequency and location models will provide the probability that an aircraft will veer off the runway *and* deviate more than a given distance from the runway edge.

Table A-5 provides the average incident rates for landing and takeoff veer-offs.

It is also possible to use an alternative approach that may be more accurate but will require intensive calculations and the need to use an electronic spreadsheet or computer software. Details of the second approach can be found in the attachment to this appendix.

Subsection 5.1—Landing

For landing, it is necessary to estimate two types of risk: the risk of collision during the approach phase before the touchdown and the risk of collision during the ground phase in case the aircraft veers off the runway during the landing rollout. These two risks may be combined to provide the total risk. The veer-off risk is estimated for every landing operation, whereas the airborne risk is computed only for missed approaches under instrument conditions, which are assumed to be the worst scenario.

For the airborne phase, because this analysis is intended to evaluate the risk of collision between the approaching aircraft and an aircraft located in a parallel taxiway or an object, the analysis will focus only on the area within the immediate vicinity of the runway threshold and touchdown zone.

The basis for the analysis is the FAA/ICAO CRM and ranges of –300, 0, 750, 1,500, 3,000, and 4,500 ft along the runway, which were evaluated to develop the curves presented in Figures AA-29 to AA-34. The range corresponding to the negative number represents a distance before the runway end for an approaching aircraft, and positive values are for distances after the runway arrival end.

The plots provide the highest probability of collision during missed approaches under instrument (Cat I or Cat II) conditions. Although the CRM was developed in the 1970s and the FAA has made modifications to improve these models, the original CRM will serve as a screening tool to lead to further analysis by the FAA if the risk estimated is within a feasible range for additional analysis. The runs were made with obstacles located at various distances from the runway centerline and along the runway length.

The following steps apply to the estimation of risk during landings:

1. Calculate the risk during the airborne phase.
2. Calculate the risk during the landing rollout phase.
3. Calculate the total risk during landing.

Each of these steps is explained below.

5.1.1—Risk in Airborne Phase (Landing)

For this phase, the obstacle to the approaching aircraft is assumed to be another aircraft located in any segment of the parallel taxiway. This is a conservative assumption because, in most cases, the obstacle will be an aircraft moving on a parallel taxiway and the obstacle will have a small length compared to the total runway length.

Figure A-10 presents a typical scenario for this type of analysis. The plots are based only on the horizontal separation between the runway and taxiway centerlines, and the vertical separation is already considered in the plots presented in this section.

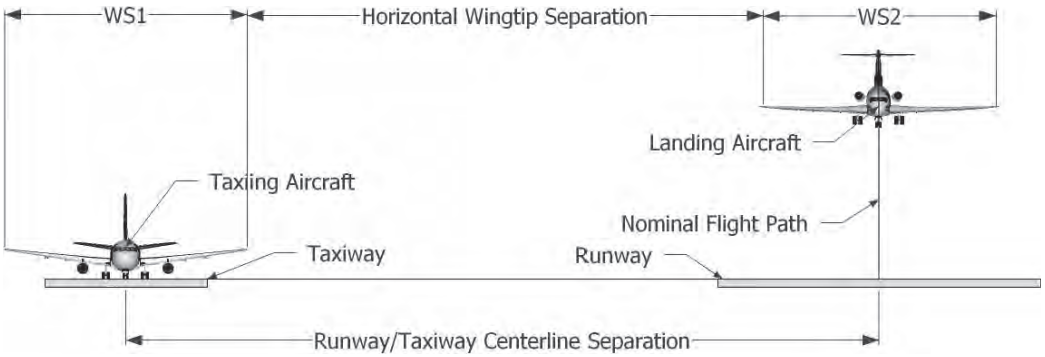


Figure A-10. Example of runway/taxiway separation analysis.

Procedure to Estimate Risk of Collision. The following presents the procedure to estimate risk of collision:

1. Identify the runway and the taxiway (or taxilane or object) centerline separation to be evaluated.
2. Identify the ADG for analysis based on the aircraft with the largest wingspan that will be using both the runway and the taxiway or taxilane.
3. Select the plot for the specific ADG involved and estimate the risk based only on the runway centerline to taxiway centerline separation (see Figures AA-29 to AA-40).
4. Using the risk level estimated, compare to 1×10^{-7}, the lowest probability for risk of severe consequences according to the risk matrix used by the FAA.

5.1.2—Risk in Ground Phase (Landing)

There are two alternatives that may be used to estimate the risk for the ground phase of landing, i.e., during the landing rollout. Alternative 1 is the default analysis and provides a simpler and direct estimate based upon generalized inputs. Alternative 2 provides a more accurate estimate for specific cases but also requires a significant amount of data and computation.

Procedure to Estimate Risk of Collision. The following are the steps to estimate risk for the landing rollout phase. For Alternative 1 (Default):

1. Figures AA-41 to AA-47 represent the risk curves that integrate both the frequency and location models for the specific case.
2. Characterize the separation between the runway centerline and the parallel taxiway, parallel taxilane, or object.
3. Characterize the ADG involved in the analysis.
4. Select the correct plot for the ADG involved in the analysis.
5. Enter the centerline separation to obtain the risk of collision in the plot selected.

For Alternative 2:

1. Obtain 1 year of historical landing operational data and information on weather conditions for the runway.
2. Calculate the frequency of landing veer-offs for the runway by applying the frequency model (see "Event Probability" and Table 7 in Chapter 4).
3. Calculate the probability that the aircraft veers off beyond a given distance:
   a. Obtain the wingtip clearance *WD* between the aircraft landing and the nearest obstacle, as shown in Figures A-11 and A-12, by placing the center of the aircraft landing at the edge of the runway.
   b. Use *WD* and apply the location model (see Table 10) to calculate the probability of a lateral deviation beyond *WD*.
4. Multiply the frequency probability by the location probability and repeat Steps 2 and 3 for each historical landing operation on the runway.
5. Calculate the average value for the probabilities estimated with historical landing data for the runway.

$$WD = CS - RW/2 - (WS1 + WS2)/2 \quad (5)$$

where

WD is the wingtip distance,
CS is the separation between the runway and the taxiway,
RW is the runway width,
*WS*1 is the wingspan for the aircraft taking off, and
*WS*2 is the wingspan for the aircraft in the parallel taxiway.

If the analysis is for a specific ADG, *WD* can be picked up from Table A-6.

Another possibility is the evaluation of separation between the runway and an object. Figure A-12 shows an example using a runway and a service road. In this case, the wingtip separation is calculated using Equation 6:

$$WD = CS - RW/2 - SW/2 - WS/2 \quad (6)$$

where

WD is the wingtip separation,
CS is the separation between the runway and the service road,
RW is the runway width,
SW is the width of the service road, and
WS is the wingspan of the aircraft.

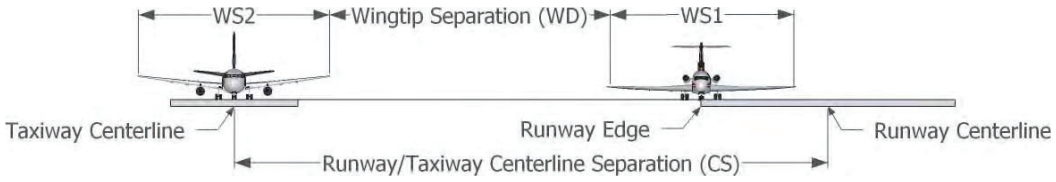


Figure A-11. Typical runway/taxiway scenario for runway veer-off incidents.

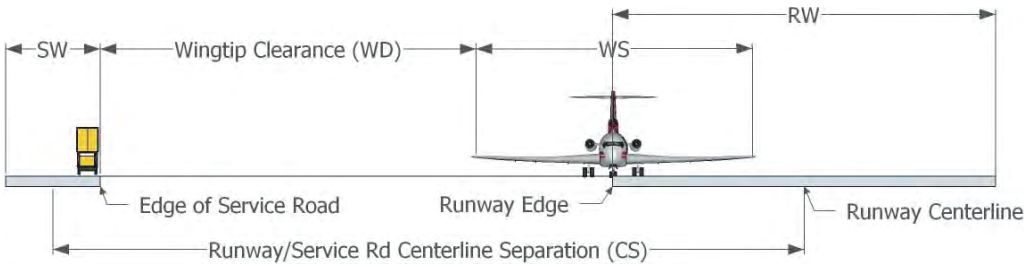


Figure A-12. Typical runway/object scenario for runway veer-off incidents.

The frequency and location models for veer-off are presented in Tables 7 and 10.

Subsection 5.2—Takeoff

For takeoff, the risk is that an aircraft will veer off the runway and strike an obstacle in the vicinity of the runway obstacle free zone (OFZ). In this case, the obstacle is assumed to be an aircraft or another object (fixed or movable) that is closest to the runway centerline. This is a conservative assumption because an aircraft may not be present in the parallel taxiway, and the obstacle has a small length compared to the total runway length.

Analysis for takeoff is only applicable to runways with departure operations only. This is because when the runway is used for both landing and takeoff, the highest risk condition is for landing.

Similar to the case for landings, there are two alternatives for estimating the risk of collision. Alternative 1 is the default analysis and is simple and direct, based upon generalized inputs. Alternative 2 provides a more accurate estimate that takes into account specific operation conditions for the airport; however, it requires a significant amount of data and computation.

Procedure to Estimate Risk of Collision. The following are the steps to estimate risk for the takeoff roll phase for Alternative 1 (Default):

Table A-6. Wingtip separation based on largest wingspan in ADG.

ADG	***RW*** ft	***WD*** ft
I	100	CS-99
II	100	CS-129
III	100	CS-168
IV	150	CS-246
V	150	CS-289
VI	200	CS-362

1. Figures AA-48 to AA-54 represent the risk curves that integrate both the frequency and location models for the specific case.
2. Characterize the separation between the runway centerline and the parallel taxiway, parallel taxilane, or object.
3. Characterize the ADG involved in the analysis.
4. Select the correct plot for the ADG involved in the analysis.
5. Enter the centerline separation to obtain the risk of collision in the plot selected.

For Alternative 2:

1. Obtain 1 year of historical takeoff operational data and information on weather conditions for the runway.
2. Calculate the frequency of takeoff veer-off for the runway by applying the frequency model (see "Event Probability" and Table 7 in Chapter 4).
3. Calculate the probability that the aircraft veers off beyond a given distance:
   a. Obtain the wingtip clearance *WD* between the aircraft taking off and the nearest obstacle, as shown in Figures A-11 and A-12, by placing the center of the aircraft landing at the edge of the runway.
   b. Use *WD* and apply the location model (see Table 10) to calculate the probability of a lateral deviation beyond *WD*.
4. Multiply the frequency probability by the location probability and repeat Steps 2 and 3 for each historical takeoff operation on the runway.
5. Calculate the average value for the probabilities estimated with historical takeoff data for the runway.

Example 3—Runway/Taxiway Separation

In this example, an ADG II airport wants to bring regular flights of ERJ-170 aircraft. The runway is 150 ft wide and has a Cat I instrument landing system (ILS). The wingspan of an ERJ-170 is 85.3 ft, and it is classified in ADG III. The existing separation between the runway and the parallel taxiway centerlines is 320 ft; however, the standard for

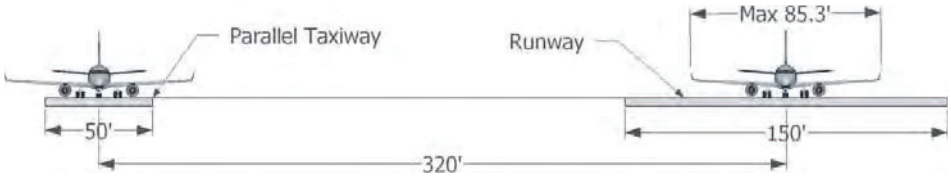


Figure A-13. Example of Runway/Taxiway Separation.

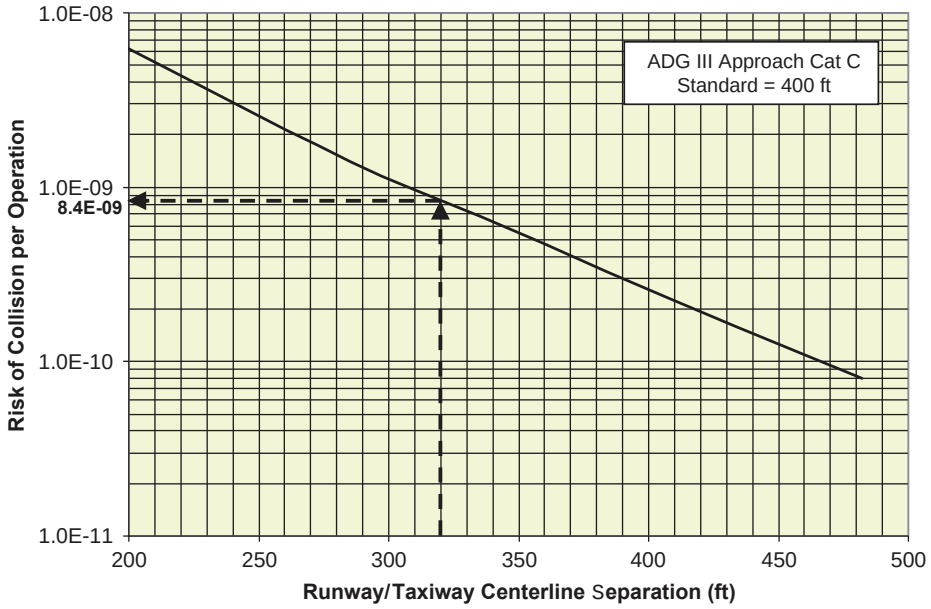


Figure A-14. Estimating airborne risk of runway/taxiway separation (ADG III–CAT I).

ADG III aircraft is 400 ft. The scenario is illustrated in Figure A-13.

The analysis involves a two-step process. In the first step, it is necessary to evaluate the risk during the airborne phase, and, in the second step, it is necessary to estimate the risk for aircraft veer-off during the landing roll.

The risk of collision for ADG III Cat I during the airborne phase of landing is estimated using Figure AA-33. The runway/taxiway centerline separation for the case is 320 ft, and the risk of collision is 8.4E-9 (see Figure A-14), or one chance in 119 million landings. This level is considered acceptable according to the FAA risk matrix.

The final step is to estimate risk of collision in case the aircraft veers off the runway. Figure AA-43 is used for ADG III aircraft, and the separation of 320 ft is entered to estimate the risk of collision of 9.0E-08 (or one chance in 11.1 million landings). As this risk is lower than 1.E-07, it may be acceptable to the FAA.

ATTACHMENT—RISK PLOTS

This attachment contains several plots that should be used with the methodology described in Appendix A.

The input parameter is always the centerline separation or the wingtip clearance in feet. The output of these plots is the risk of collision. The scale for the risk values is logarithmic. When the analysis involves one specific ADG, the centerline separation should be entered. In an example plot (see Exhibit AA-1), a text box contains the current FAA standard separation for the specific scenario.

Exhibit AA-1 also illustrates the use of these plots. To estimate the risk of collision when the centerline separation of two parallel taxiways used by aircraft in ADG I is 65 ft, use the plot shown in Figure AA-1 to enter the centerline separation and move vertically until crossing the curve. Then move horizontally to read the risk of collision—in this example, it is approximately 9.0E-07, or 9 events in 10,000,000 operations. The procedure is illustrated in Exhibit AA-1.

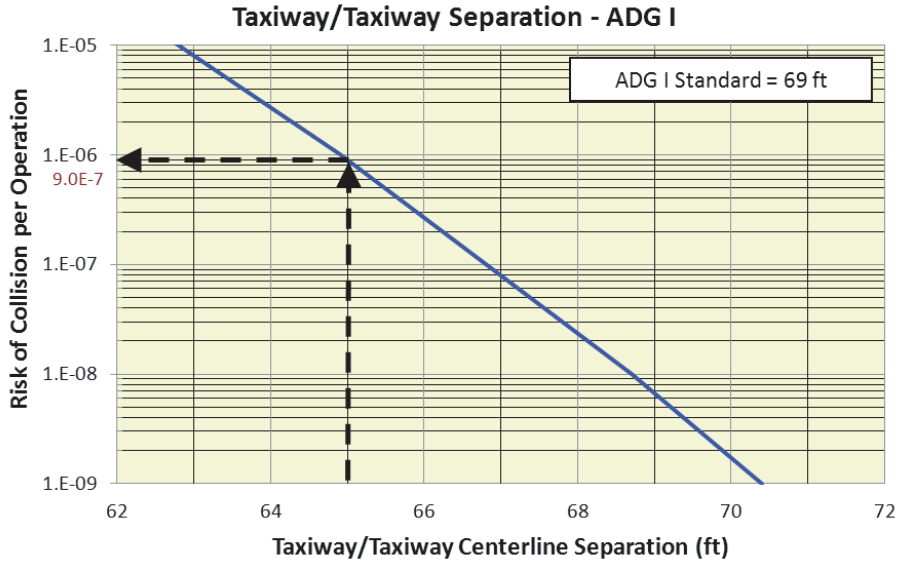


Exhibit AA-1. Example illustrating use of plots.

Section 1—Taxiway to Taxiway/Taxilane Risk Plots

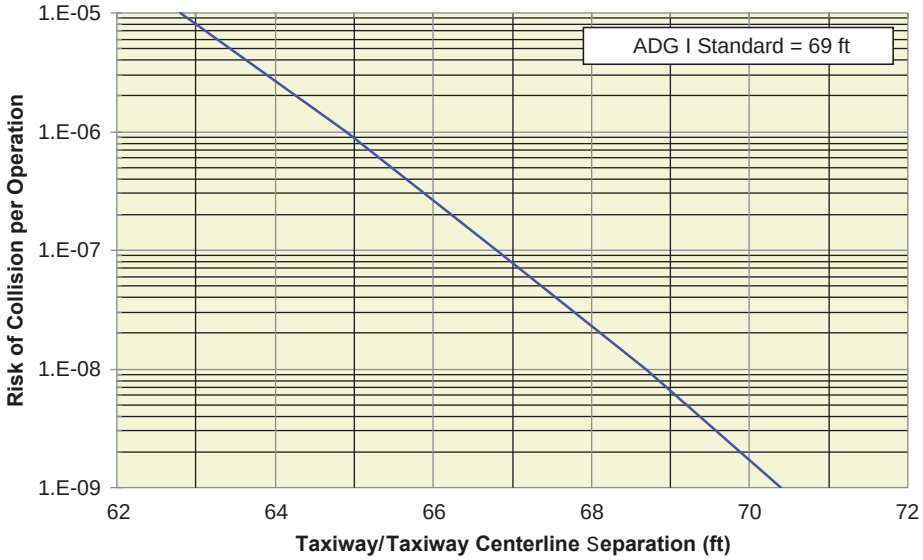


Figure AA-1. Collision risk associated with taxiway centerline separation for ADG I.

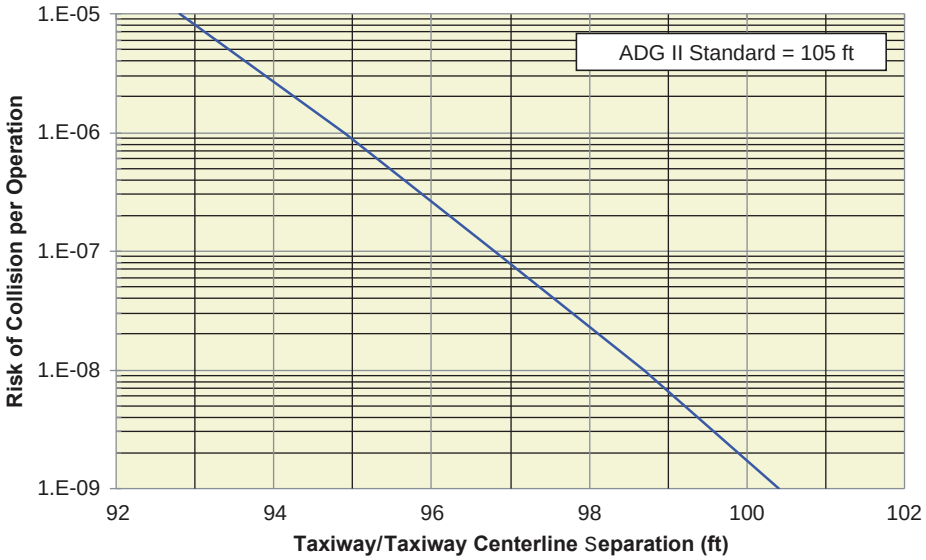


Figure AA-2. Collision risk associated with taxiway centerline separation for ADG II.

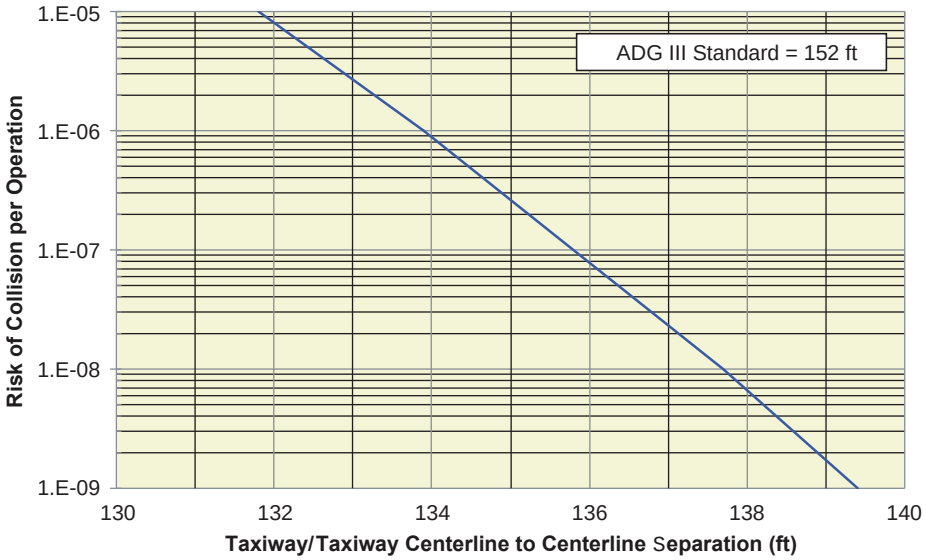


Figure AA-3. Collision risk associated with taxiway centerline separation for ADG III.

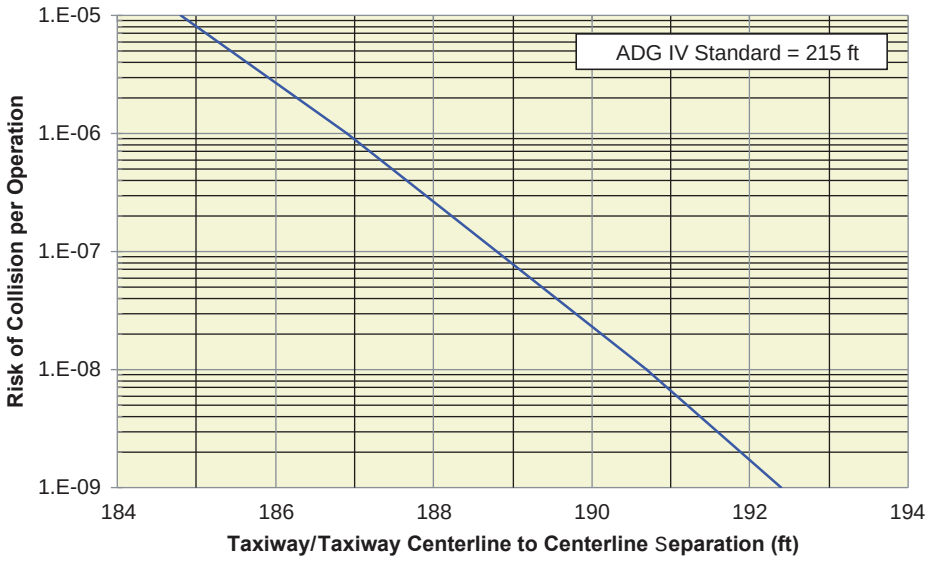


Figure AA-4. Collision risk associated with taxiway centerline separation for ADG IV.

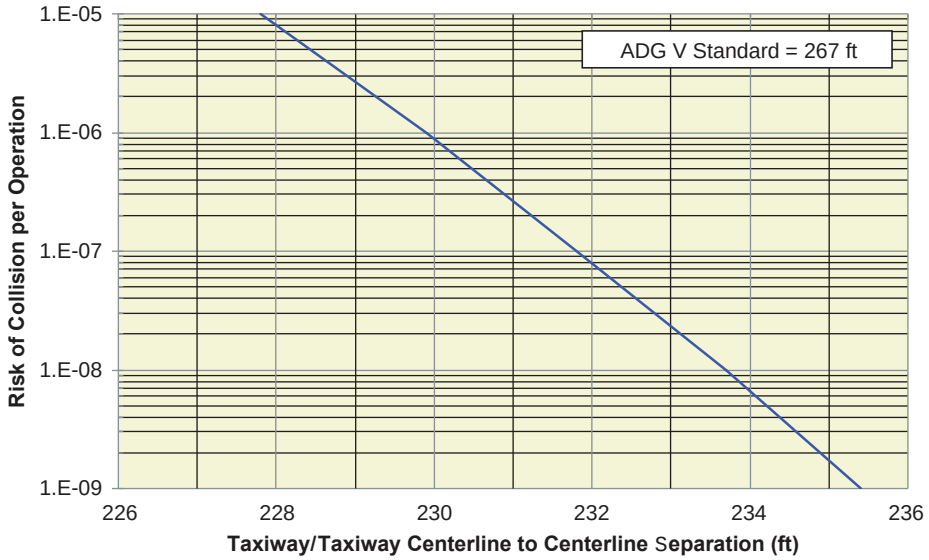


Figure AA-5. Collision risk associated with taxiway centerline separation for ADG V.

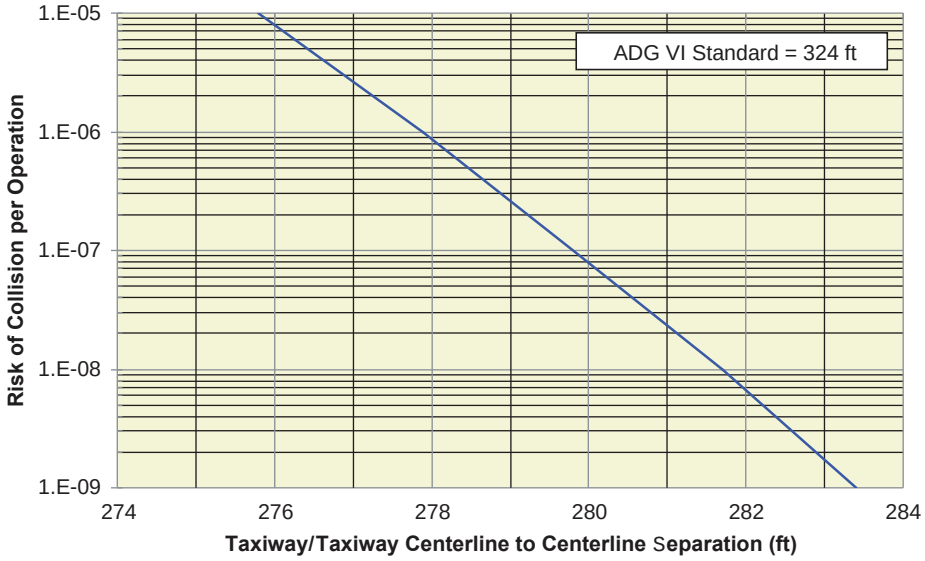


Figure AA-6. Collision risk associated with taxiway centerline separation for ADG VI.

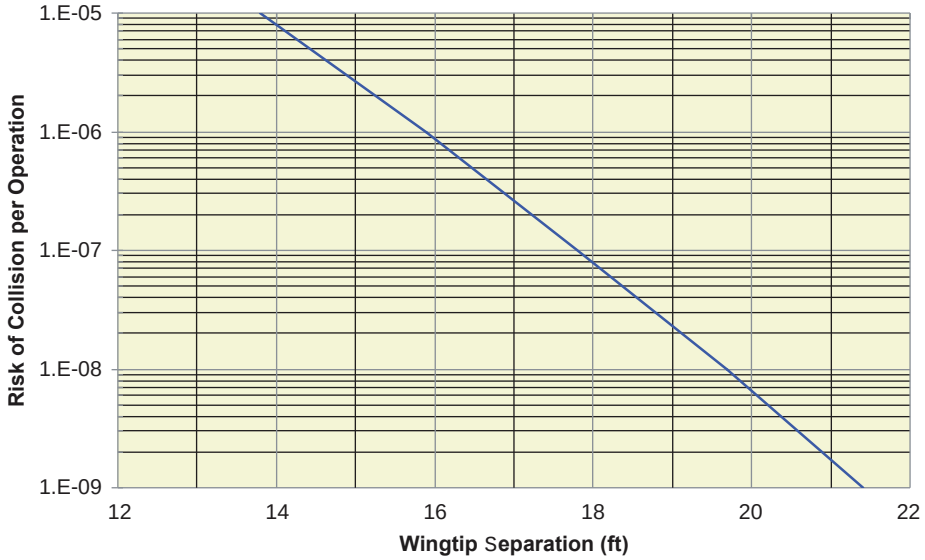


Figure AA-7. Collision risk associated with wingtip separation distance (Any ADG).

Section 2—Taxiway to Object Risk Plots

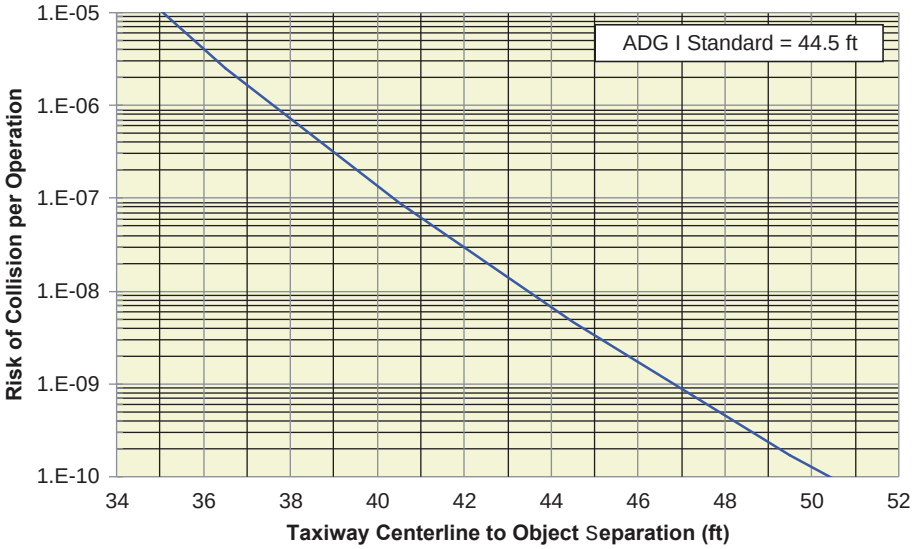


Figure AA-8. Collision risk associated with taxiway to object separation for ADG I.

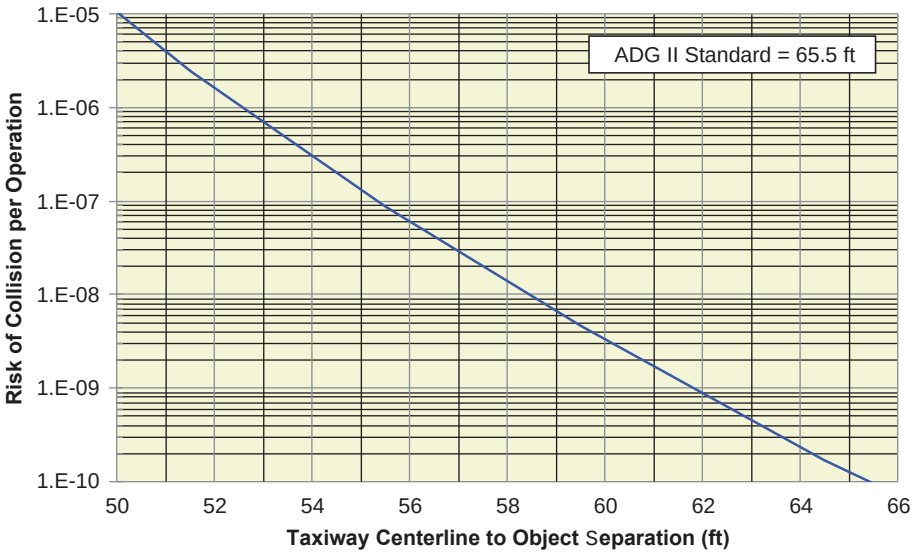


Figure AA-9. Collision risk associated with taxiway to object separation for ADG II.

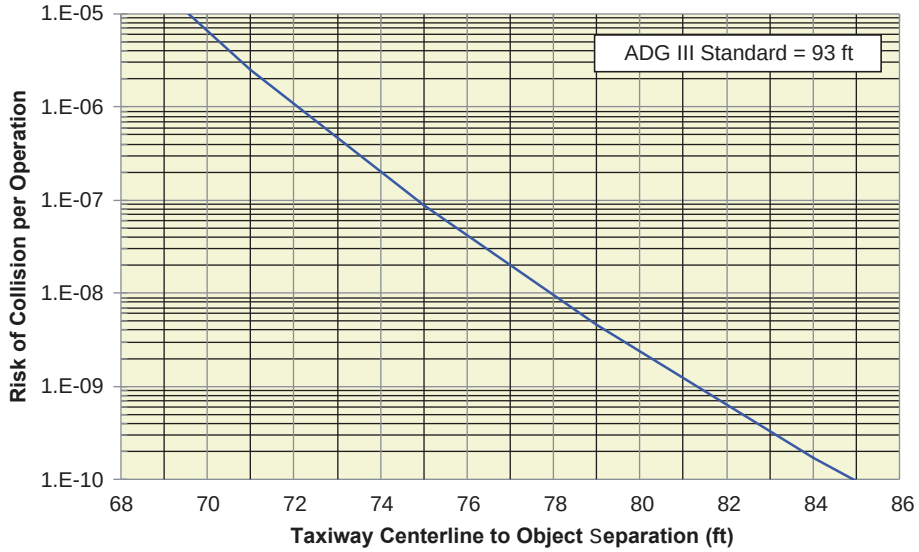


Figure AA-10. Collision risk associated with taxiway to object separation for ADG III.

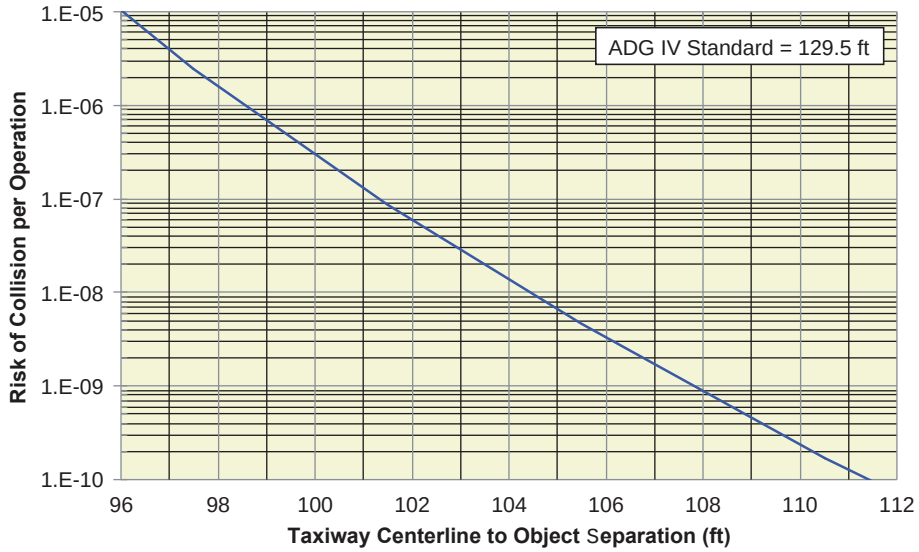


Figure AA-11. Collision risk associated with taxiway to object separation for ADG IV.

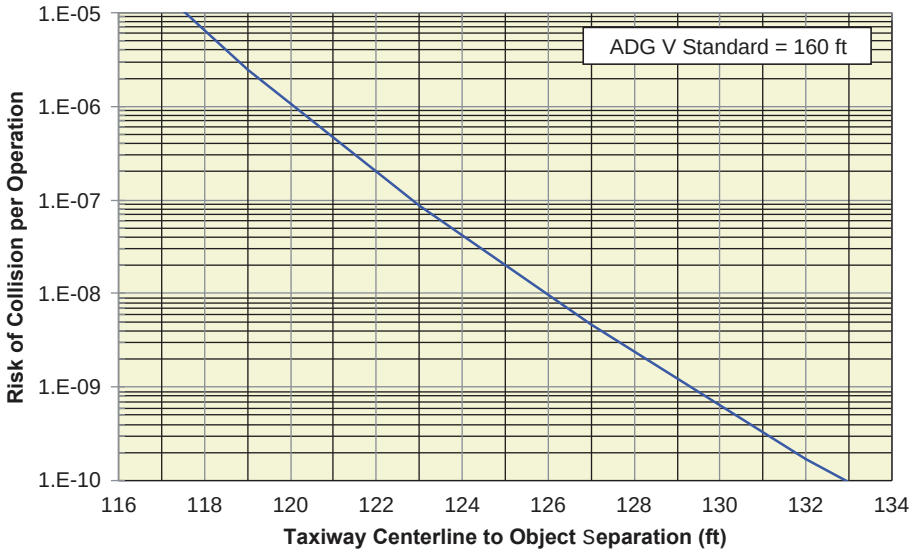


Figure AA-12. Collision risk associated with taxiway to object separation for ADG V.

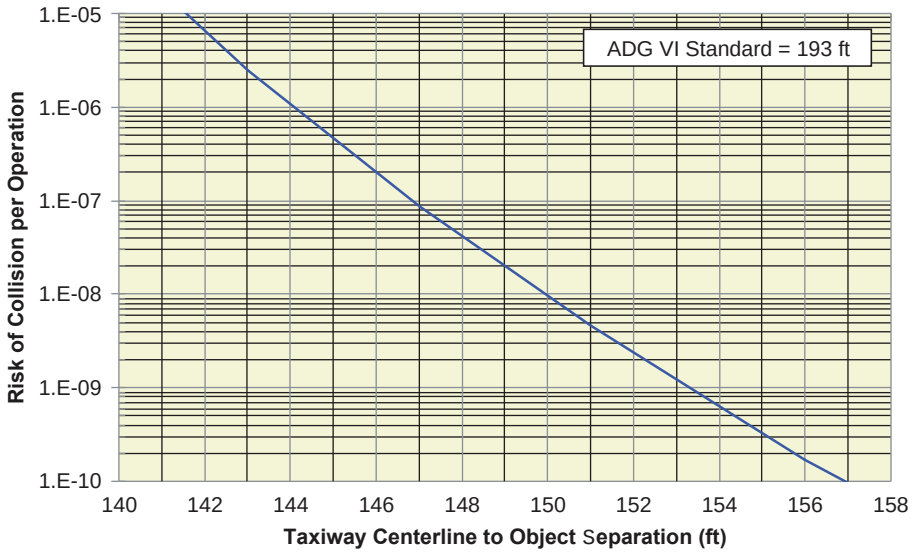


Figure AA-13. Collision risk associated with taxiway to object separation for ADG VI.

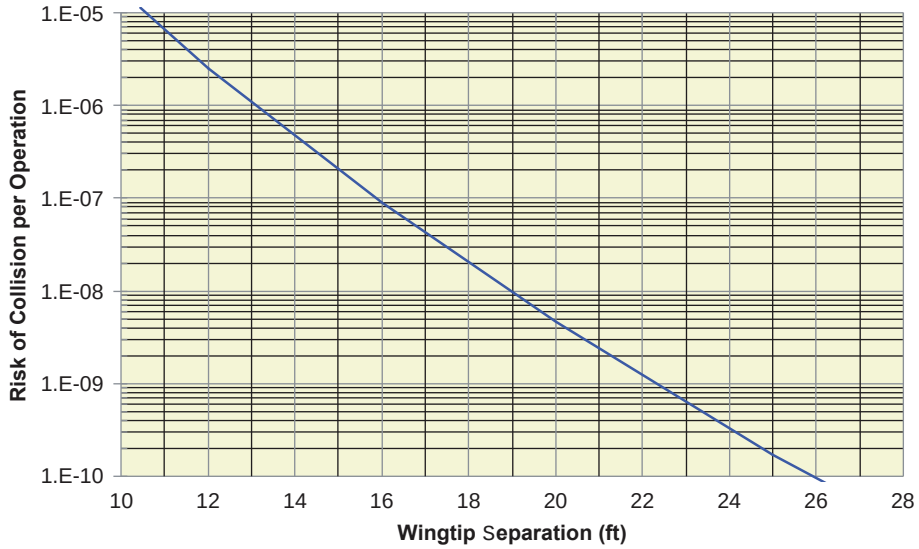


Figure AA-14. Collision risk associated with taxiway wingtip to object clearance (any ADG).

Section 3—Taxilane to Taxilane Risk Plots

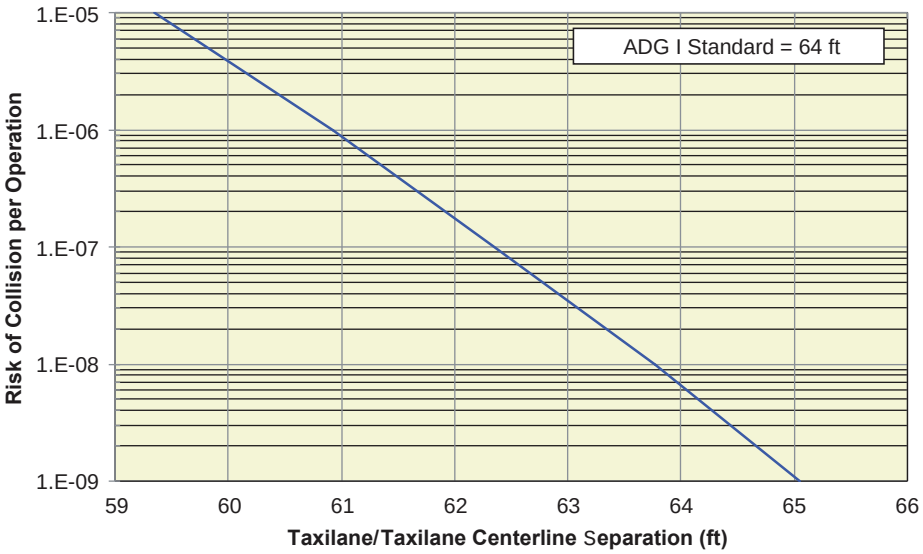


Figure AA-15. Collision risk associated with taxilane to object separation for ADG I.

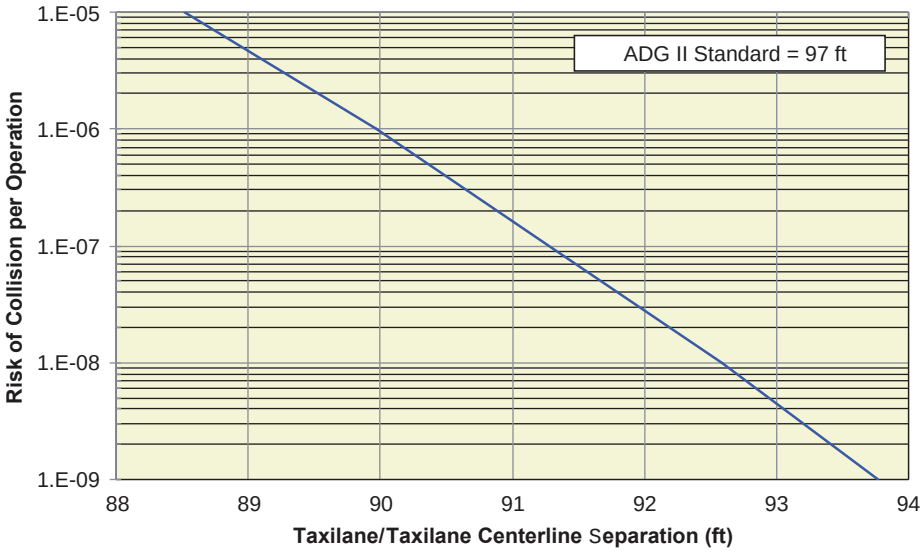


Figure AA-16. Collision risk associated with taxilane to object separation for ADG II.

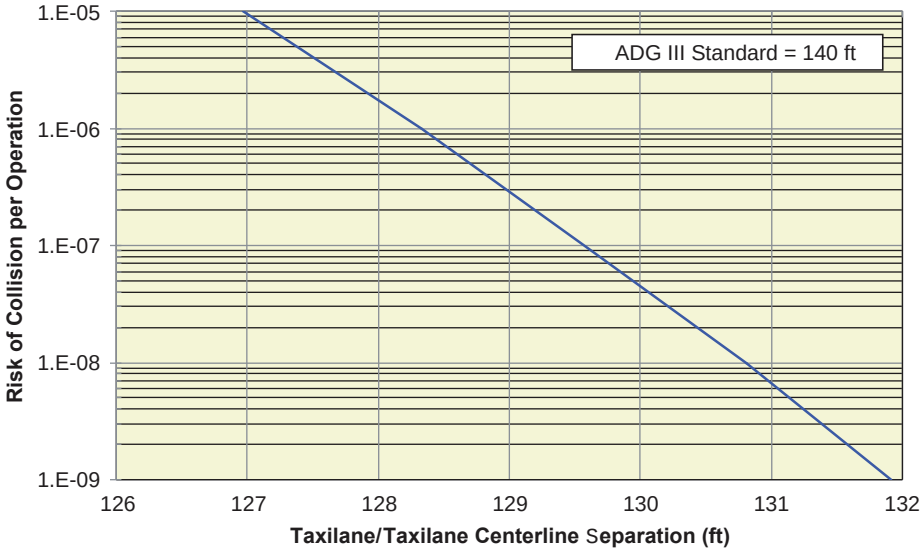


Figure AA-17. Collision risk associated with taxilane to object separation for ADG III.

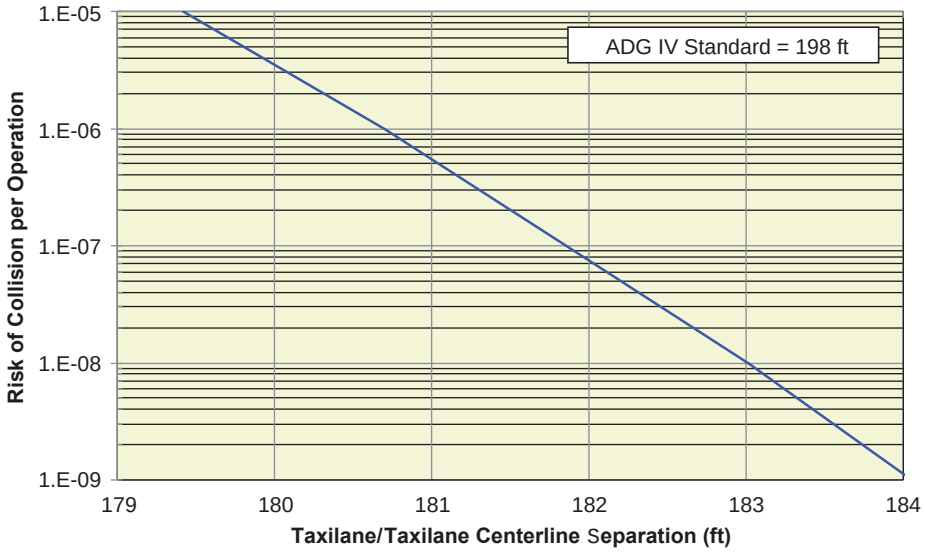


Figure AA-18. Collision risk associated with taxilane to object separation for ADG IV.

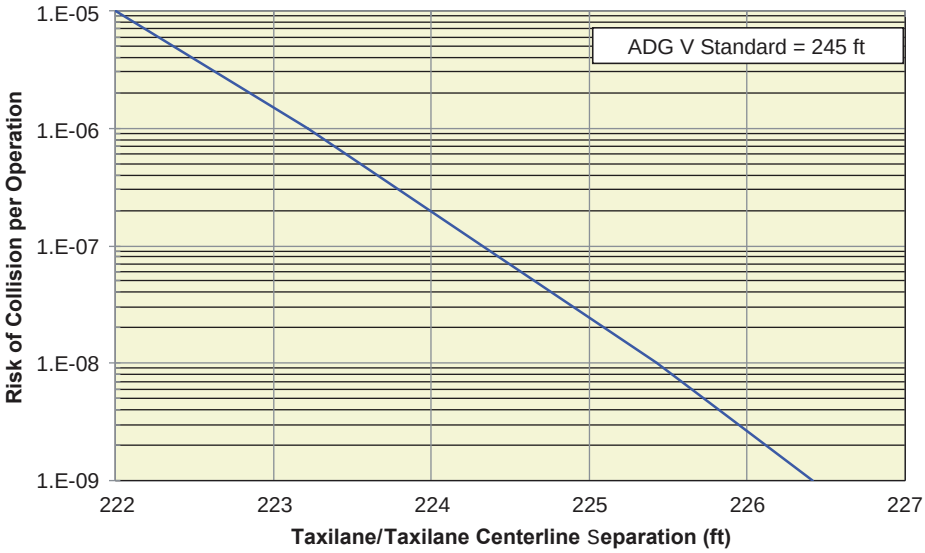


Figure AA-19. Collision risk associated with taxilane to object separation for ADG V.

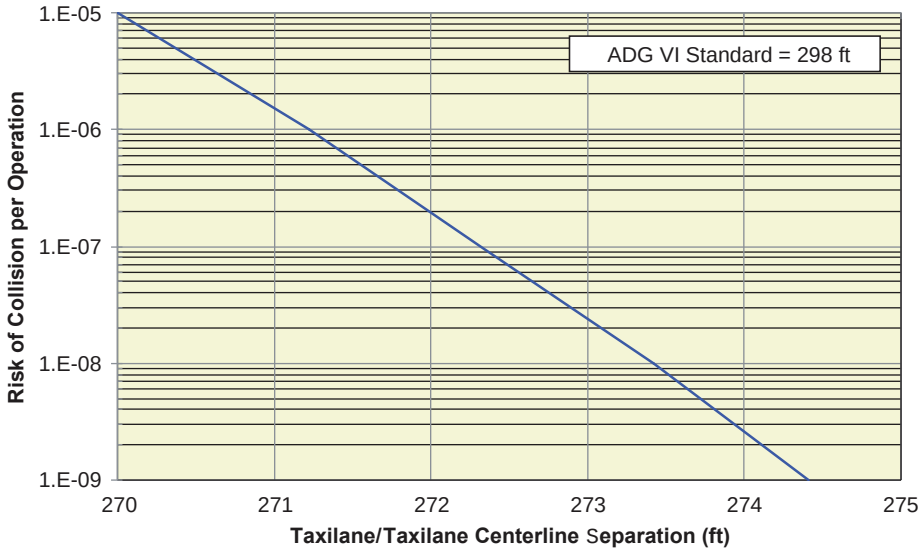


Figure AA-20. Collision risk associated with taxilane to object separation for ADG VI.

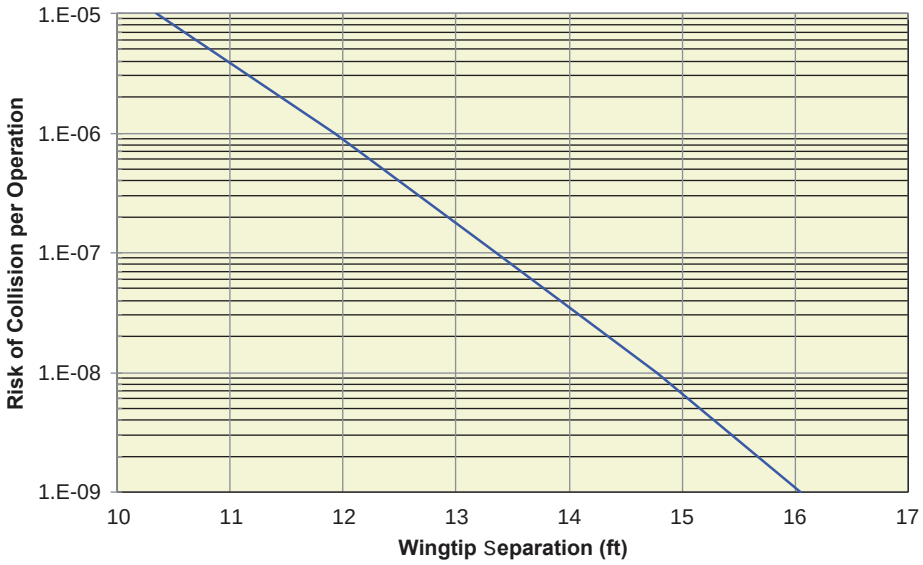


Figure AA-21. Collision risk associated with taxilane wingtip separation distance (any ADG).

Section 4—Taxilane to Object Risk Plots

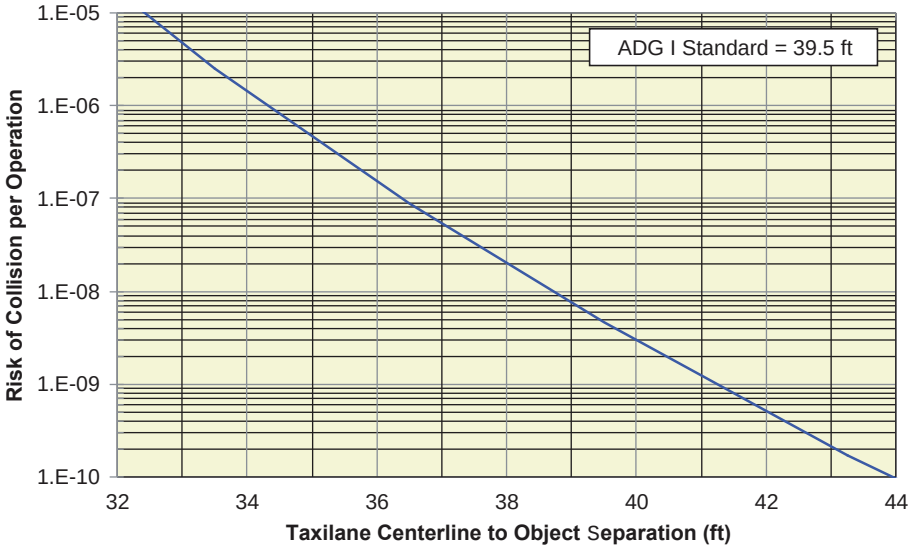


Figure AA-22. Collision risk associated with taxilane to object separation for ADG I.

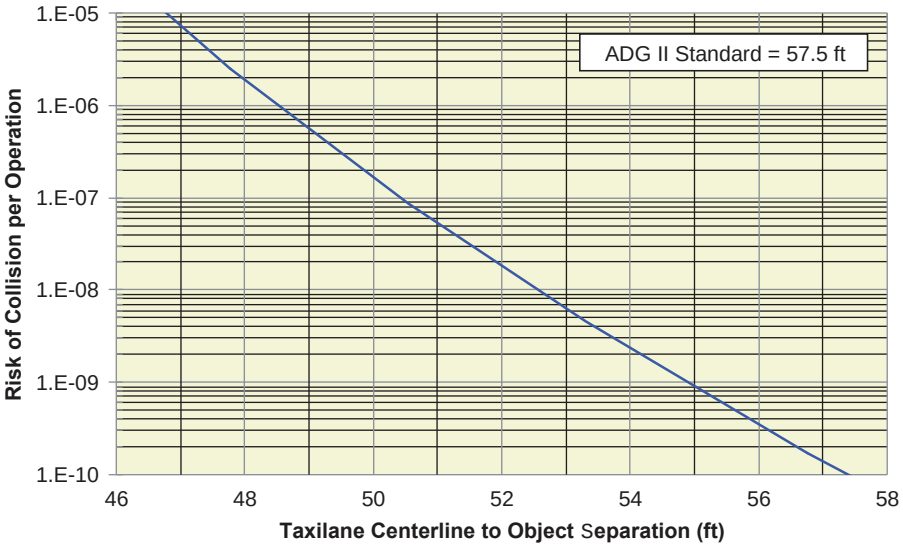


Figure AA-23. Collision risk associated with taxilane to object separation for ADG II.

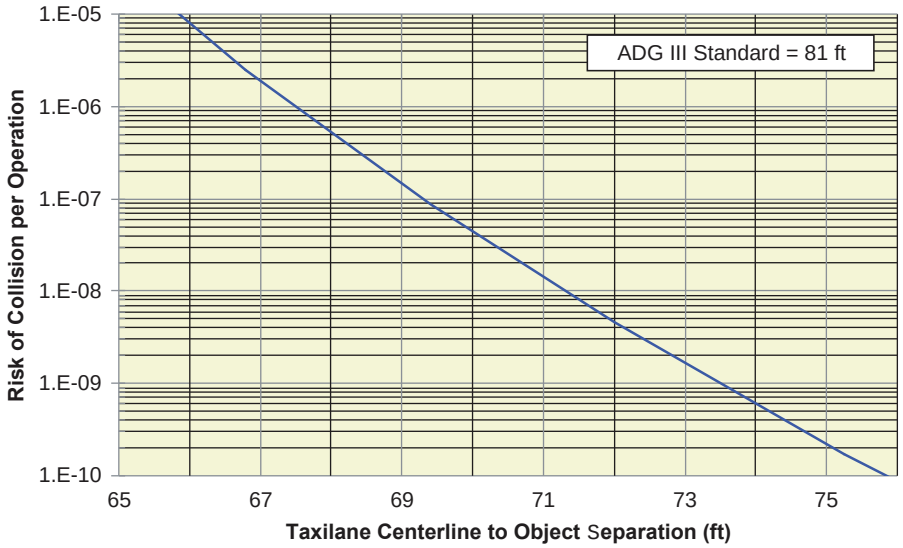


Figure AA-24. Collision risk associated with taxilane to object separation for ADG III.

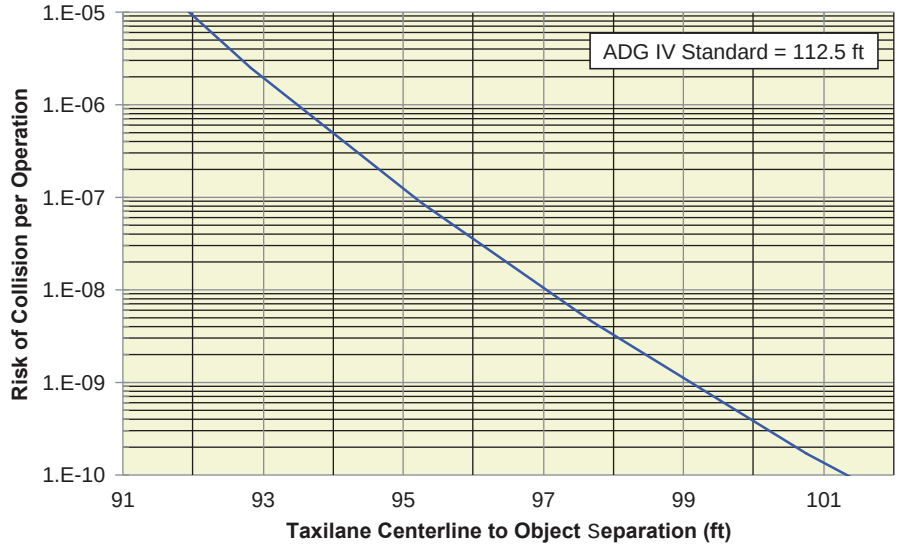


Figure AA-25. Collision risk associated with taxilane to object separation for ADG IV.

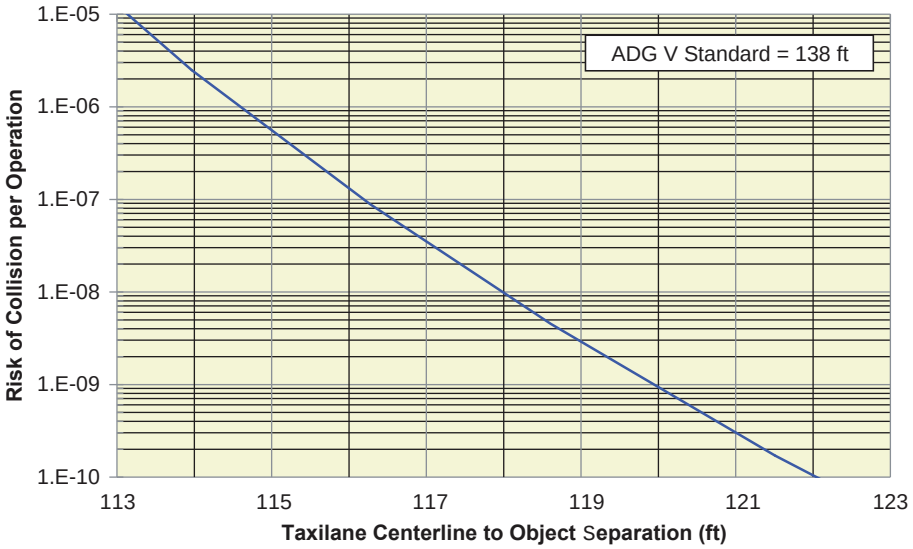


Figure AA-26. Collision risk associated with taxilane to object separation for ADG V.

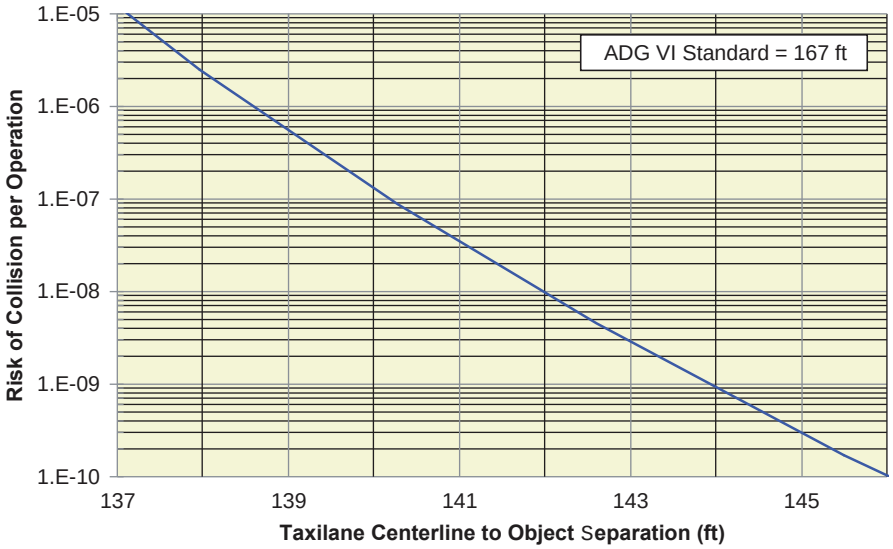


Figure AA-27. Collision risk associated with taxilane to object separation for ADG VI.

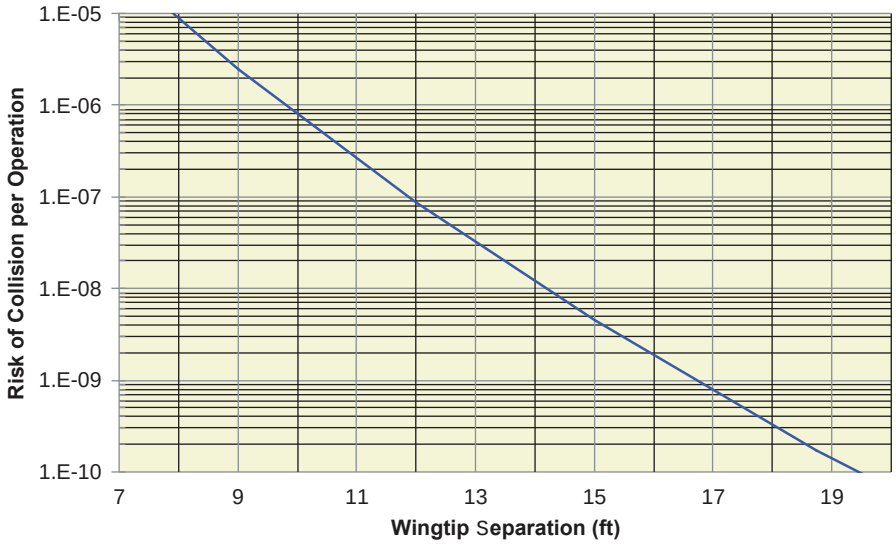


Figure AA-28. Collision risk associated with taxilane wingtip to object clearance—any ADG.

Section 5.1.1—Runway to Taxiway, Taxilane, or Object Risk in Airborne Phase (Plots Based on FAA/ICAO CRM)

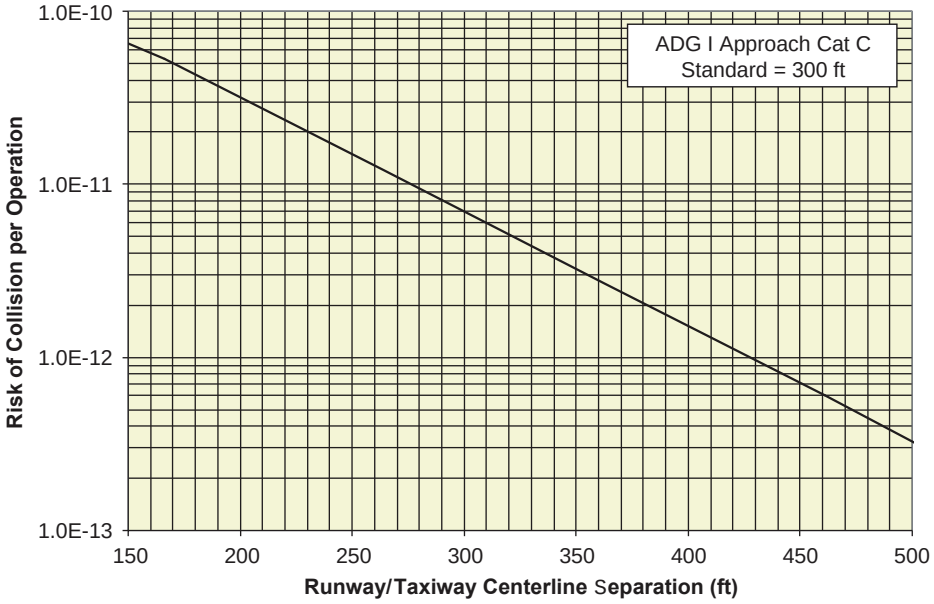


Figure AA-29. Missed approach collision risk for ADG I Cat I.

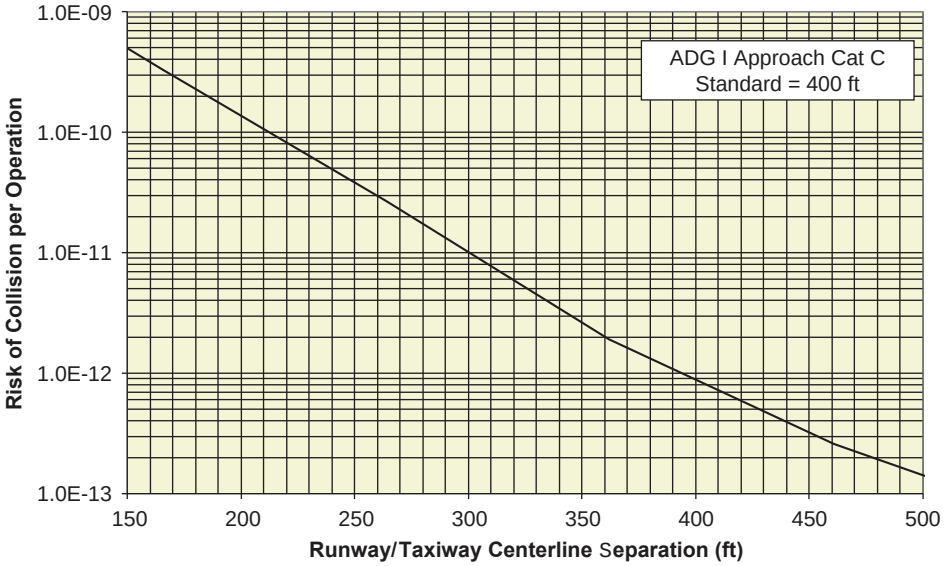


Figure AA-30. Missed approach collision risk for ADG I Cat II.

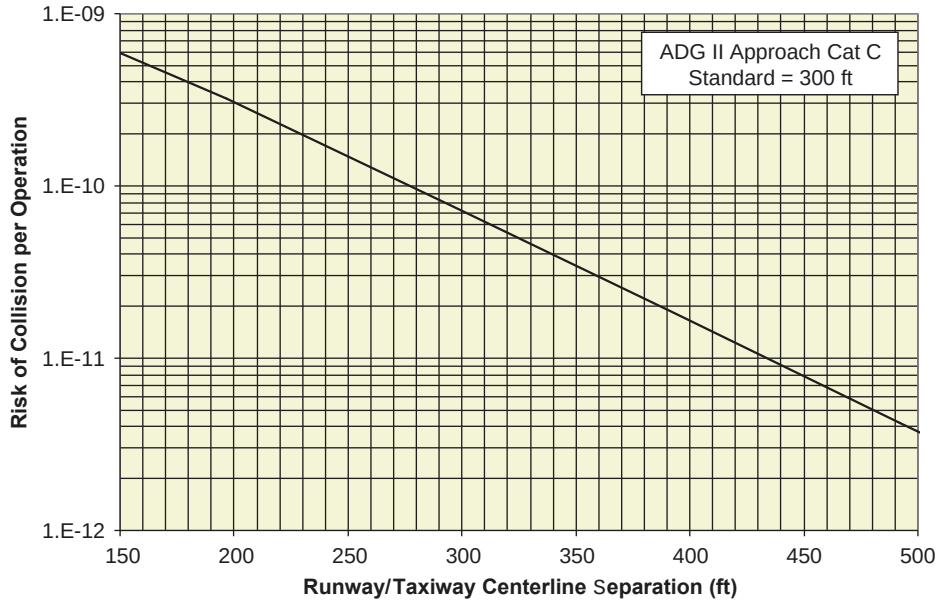


Figure AA-31. Missed approach collision risk for ADG II Cat I.

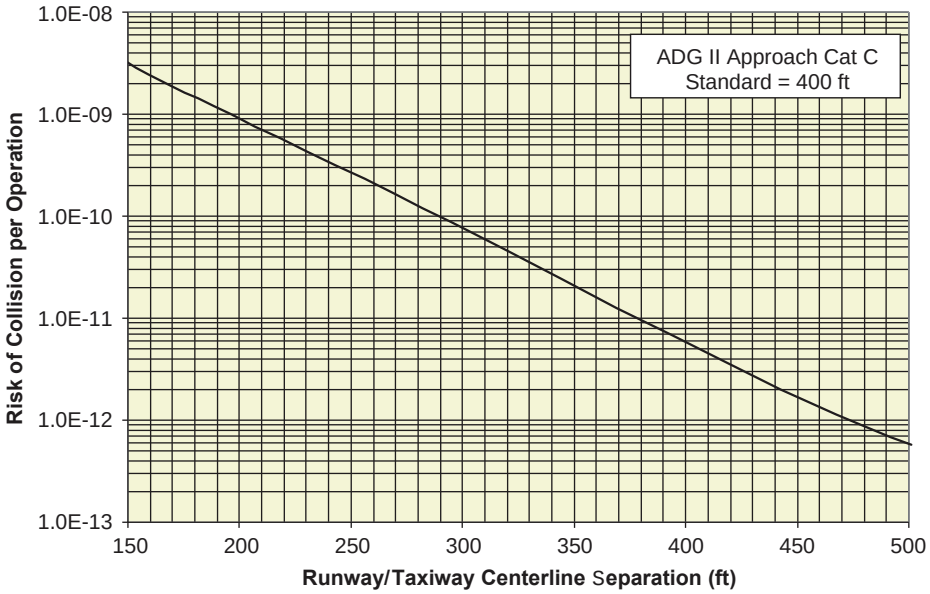


Figure AA-32. Missed approach collision risk for ADG II Cat II.

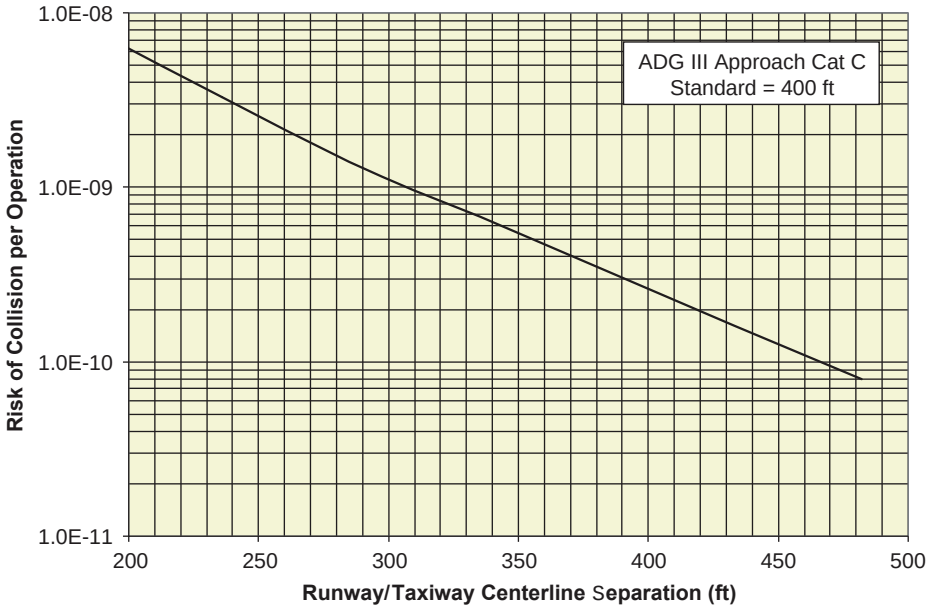


Figure AA-33. Missed approach collision risk for ADG III Cat I.

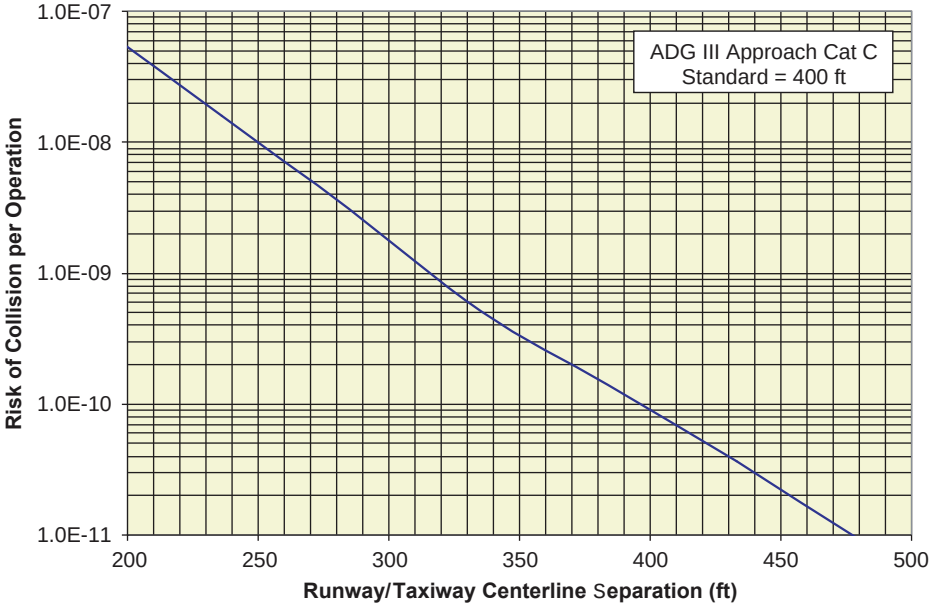


Figure AA-34. Missed approach collision risk for ADG III Cat II.

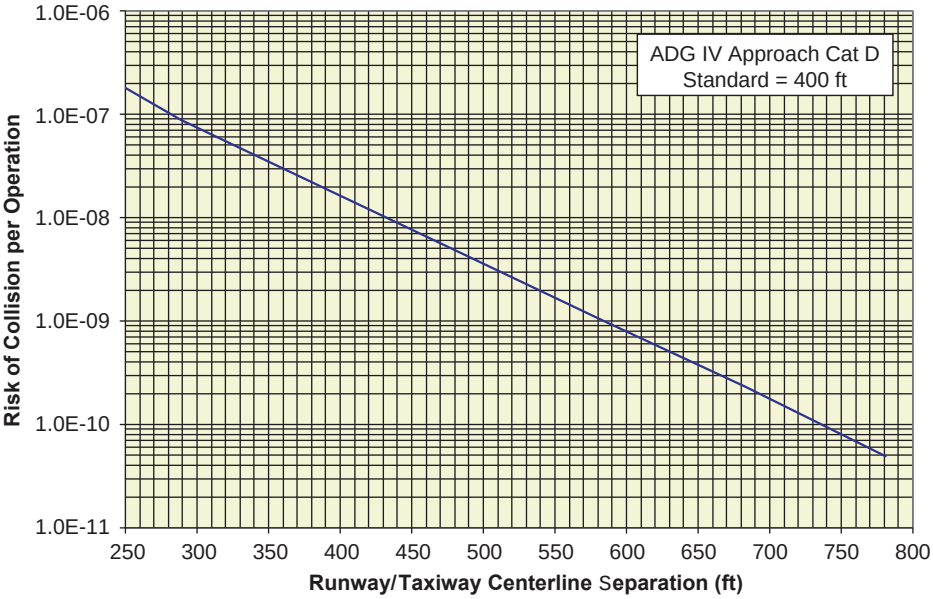


Figure AA-35. Missed approach collision risk for ADG IV Cat I.

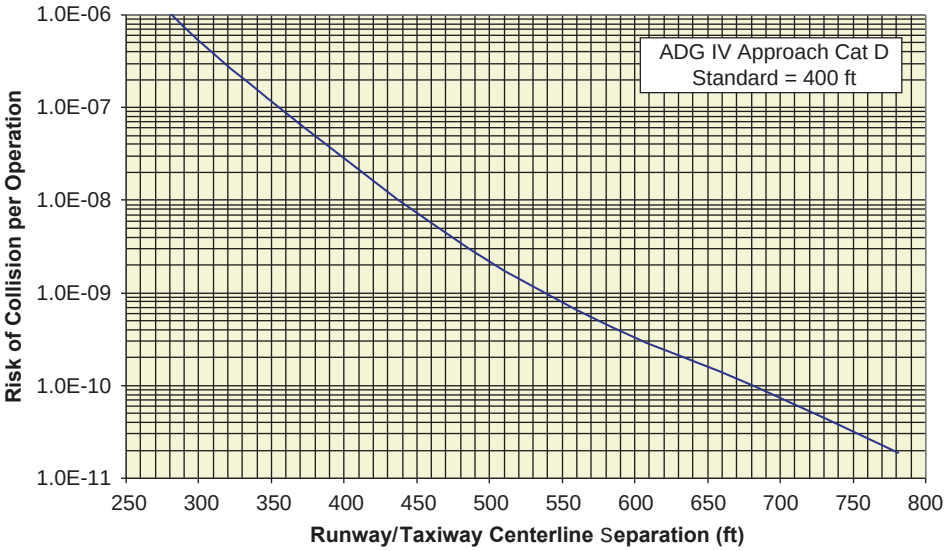
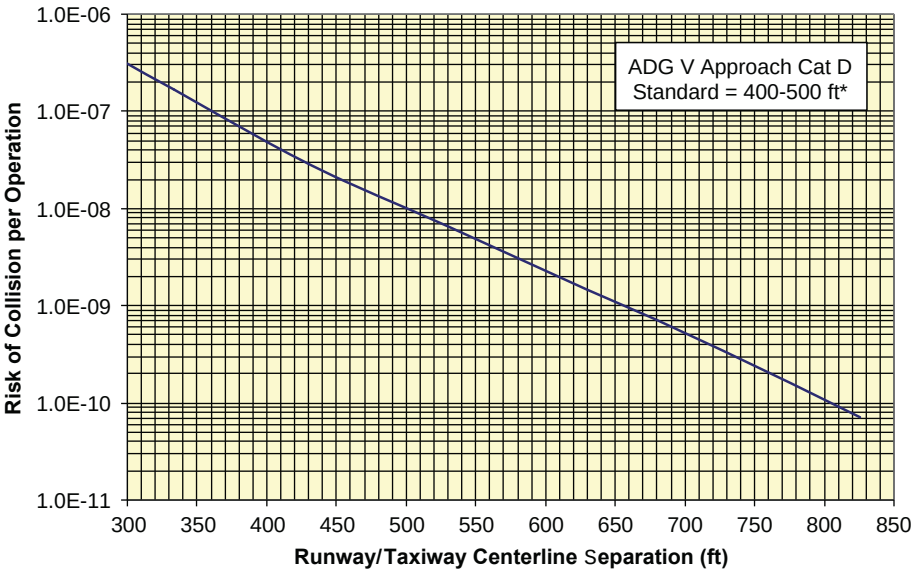
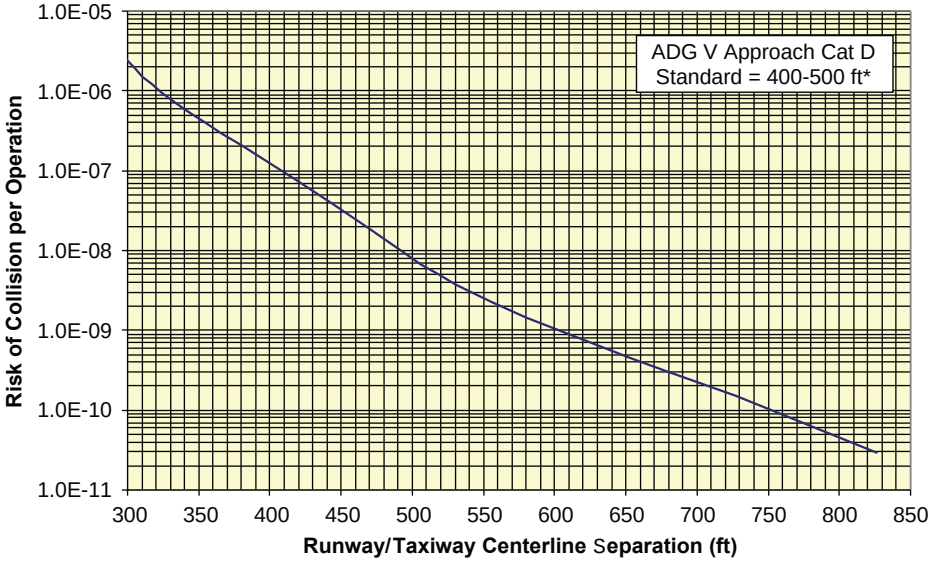


Figure AA-36. Missed approach collision risk for ADG IV Cat II.



For specific standard, please check Table 2-2 in FAA AC 150/5300-13.

Figure AA-37. Missed approach collision risk for ADG V Cat I.



For specific standard, please check Table 2-2 in FAA AC 150/5300-13.

Figure AA-38. Missed approach collision risk for ADG V Cat II.

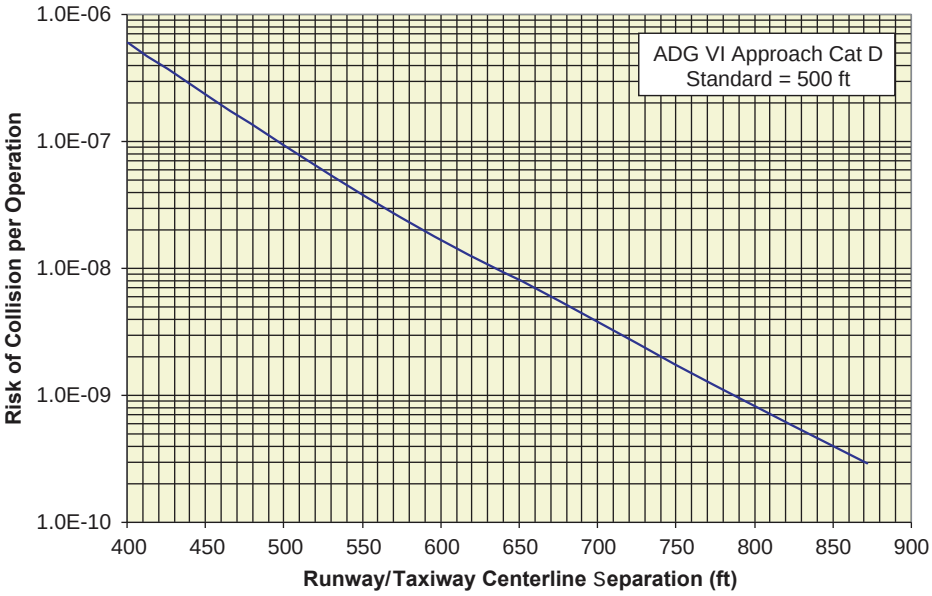
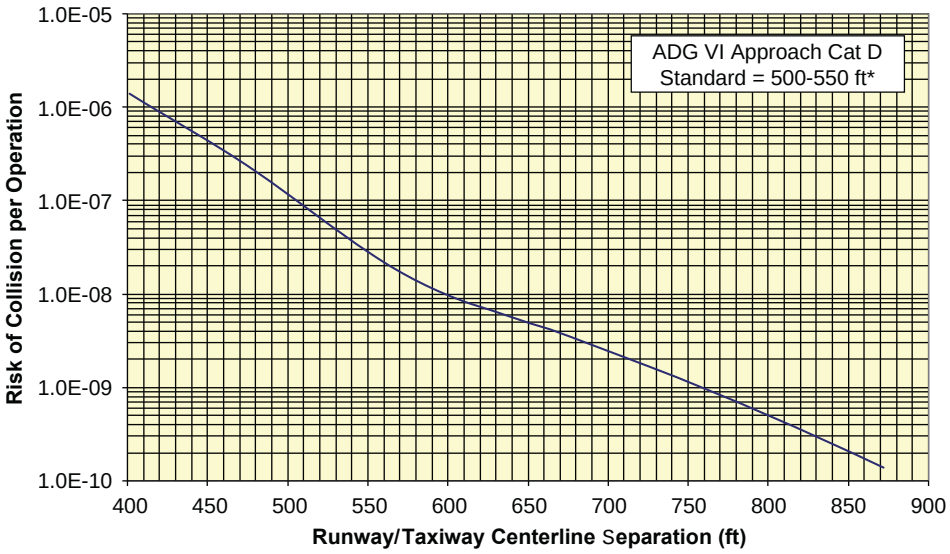


Figure AA-39. Missed approach collision risk for ADG VI Cat I.



For specific standard, please check Table 2-2 in FAA AC 150/5300-13.

Figure AA-40. Missed approach collision risk for ADG VI Cat II.

Section 5.1.2—Landing Veer-Off Collision Risk Plots (Ground Phase)

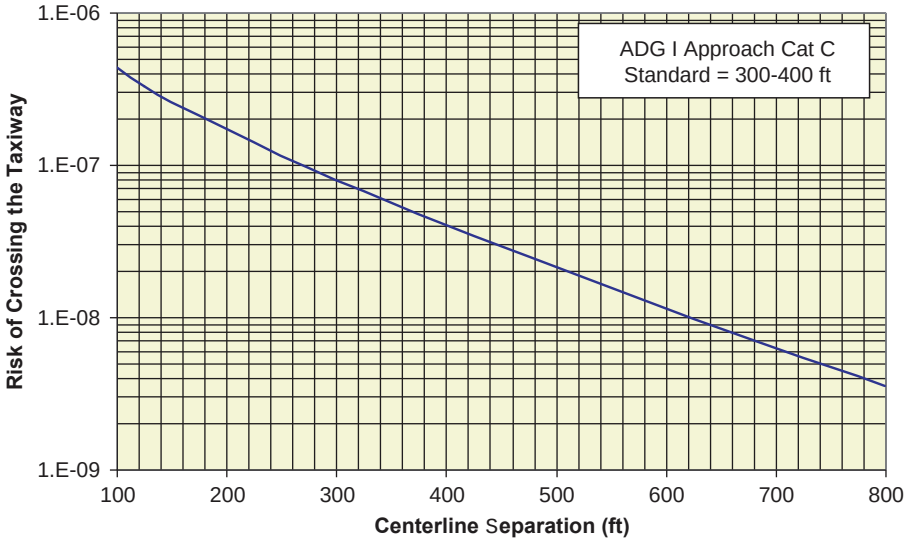


Figure AA-41. Landing veer-off collision risk for ADG I.

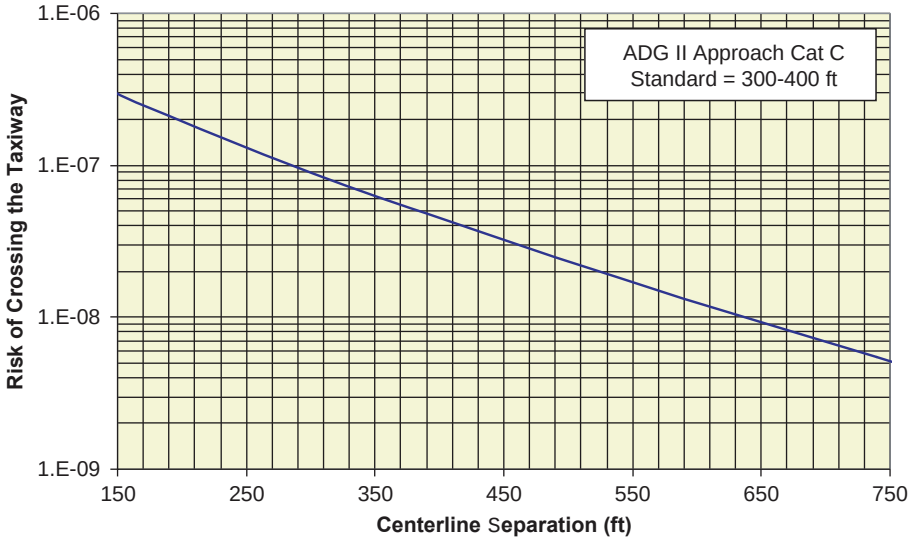


Figure AA-42. Landing veer-off collision risk for ADG II.

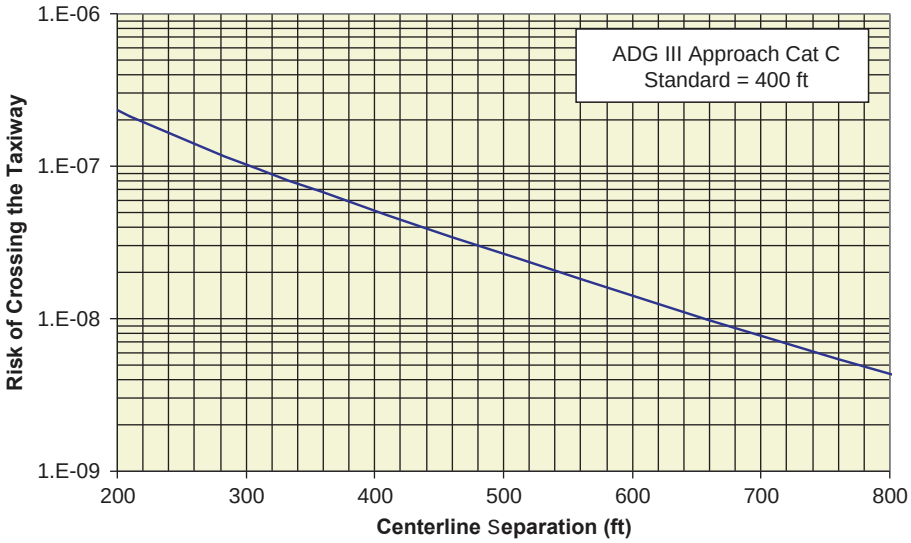


Figure AA-43. Landing veer-off collision risk for ADG III.

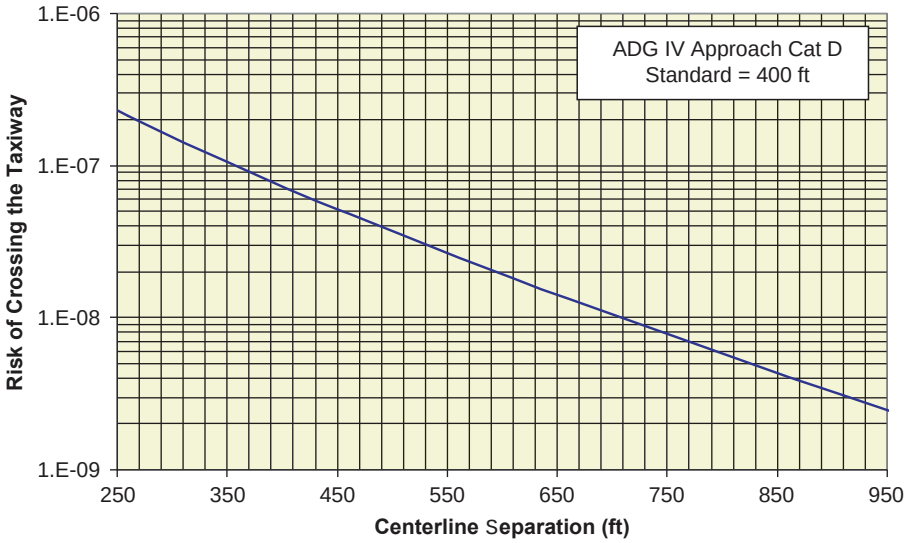
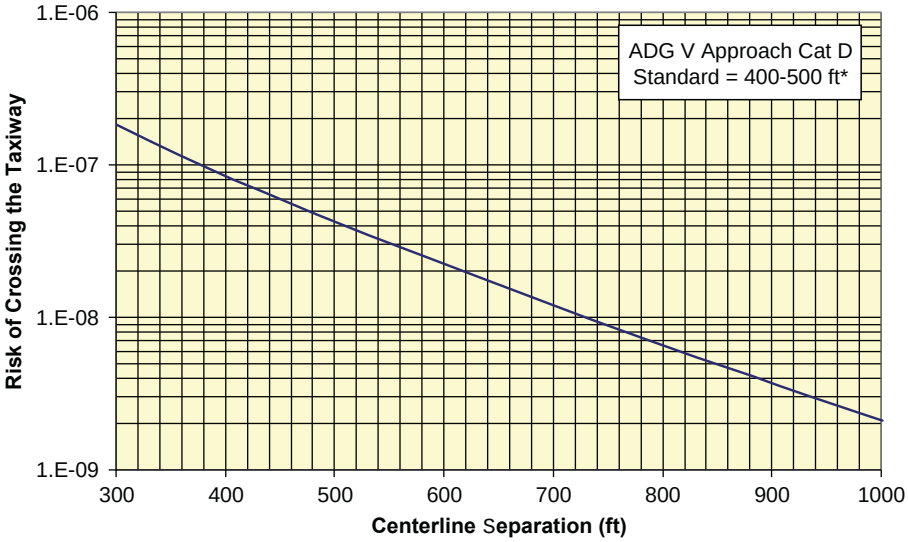
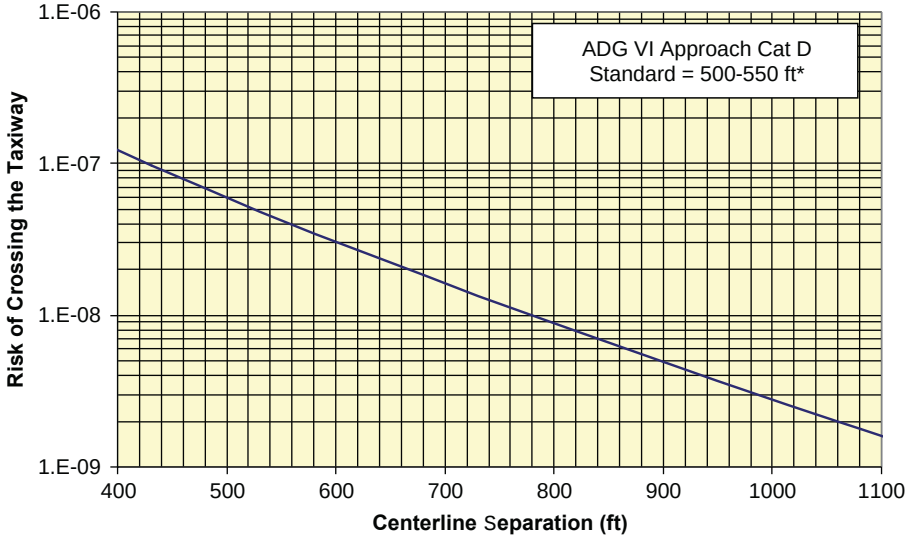


Figure AA-44. Landing veer-off collision risk for ADG IV.



For specific standard, please check Table 2-2 in FAA AC 150/5300-13.

Figure AA-45. Landing veer-off collision risk for ADG V.



For specific standard, please check Table 2-2 in FAA AC 150/5300-13.

Figure AA-46. Landing veer-off collision risk for ADG VI.

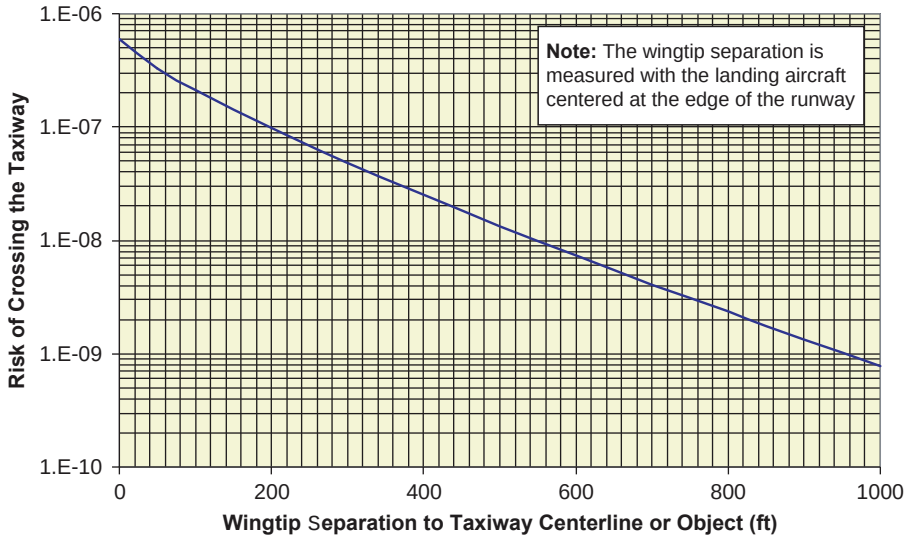


Figure AA-47. Landing veer-off collision risk based on wingtip clearance—any ADG.

Section 5.2—Takeoff Veer-Off Collision Risk Plots

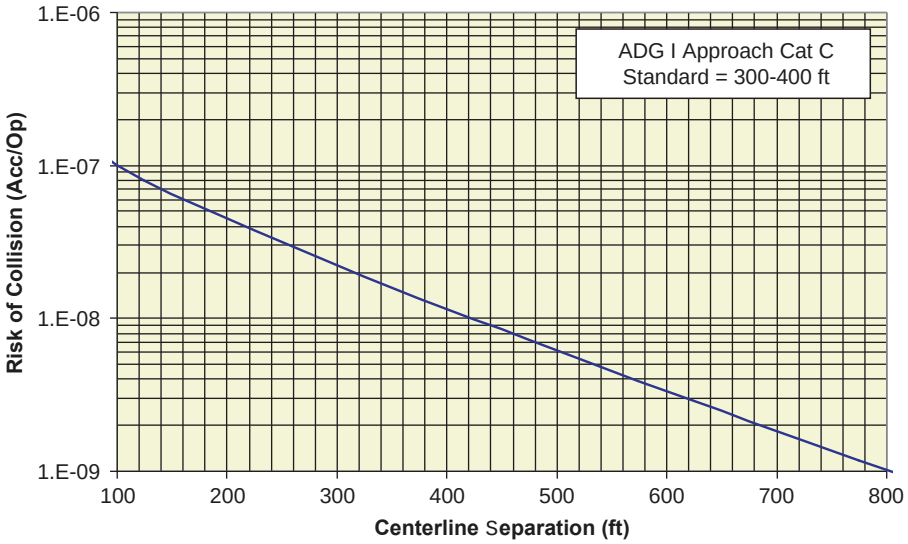


Figure AA-48. Takeoff veer-off collision risk for ADG I.

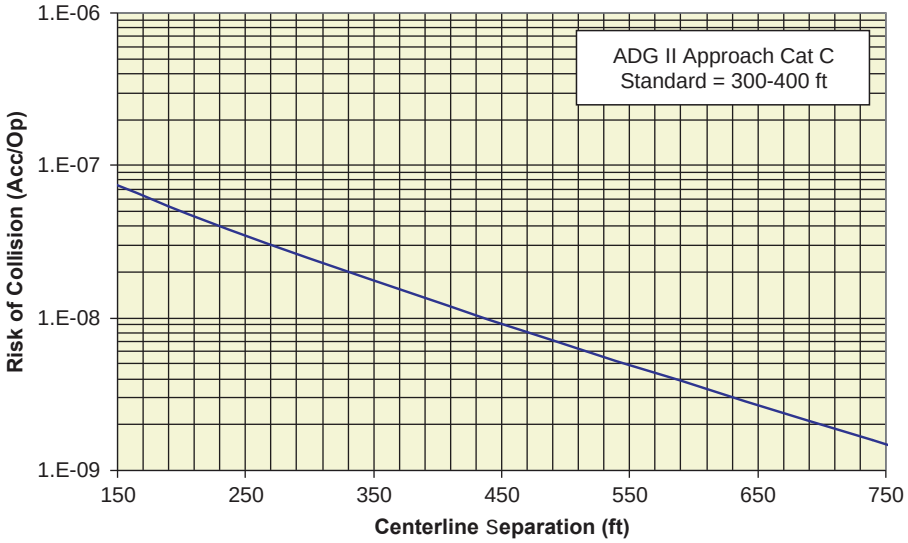


Figure AA-49. Takeoff veer-off collision risk for ADG II.

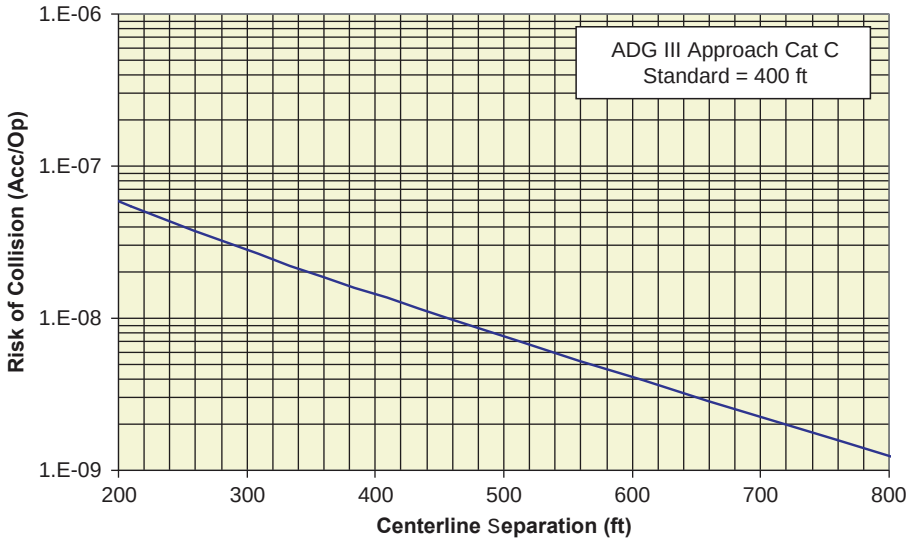


Figure AA-50. Takeoff veer-off collision risk for ADG III.

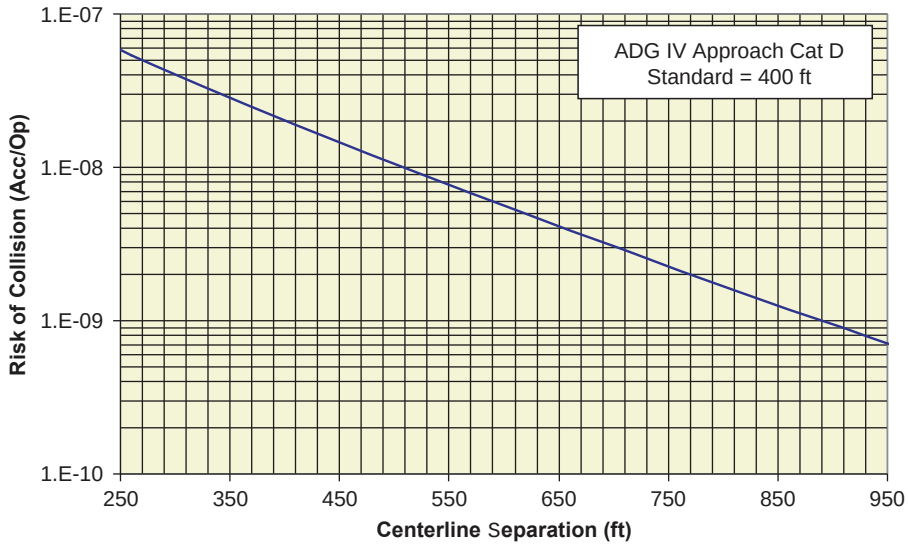


Figure AA-51. Takeoff veer-off collision risk for ADG IV.

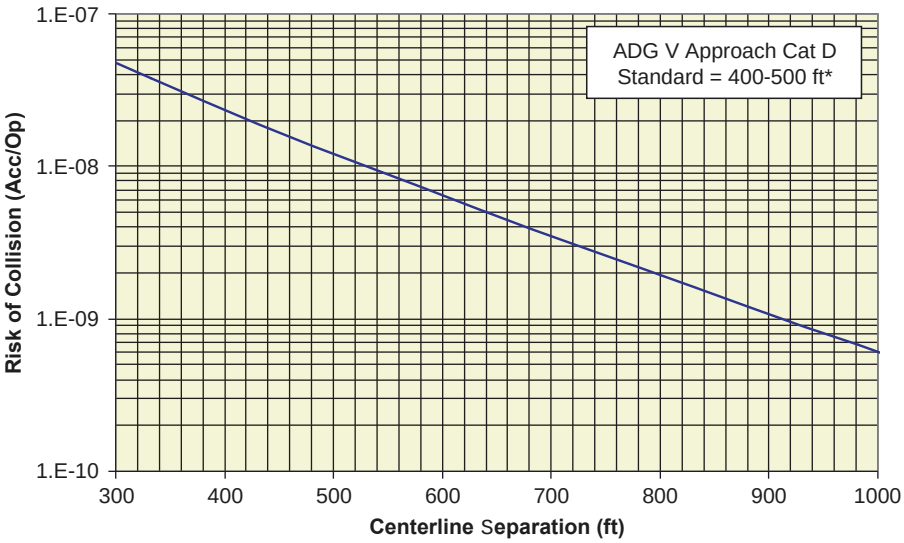


Figure AA-52. Takeoff veer-off collision risk for ADG V.

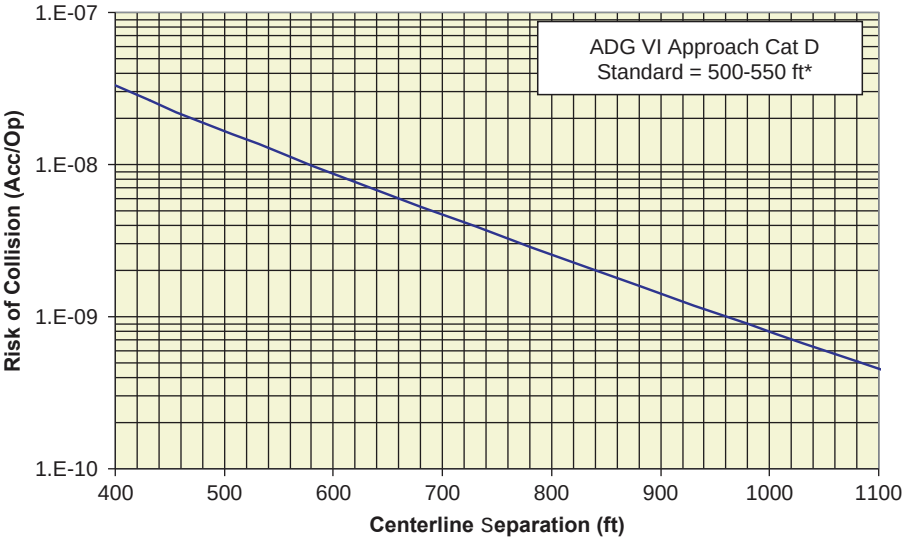


Figure AA-53. Takeoff veer-off collision risk for ADG VI.

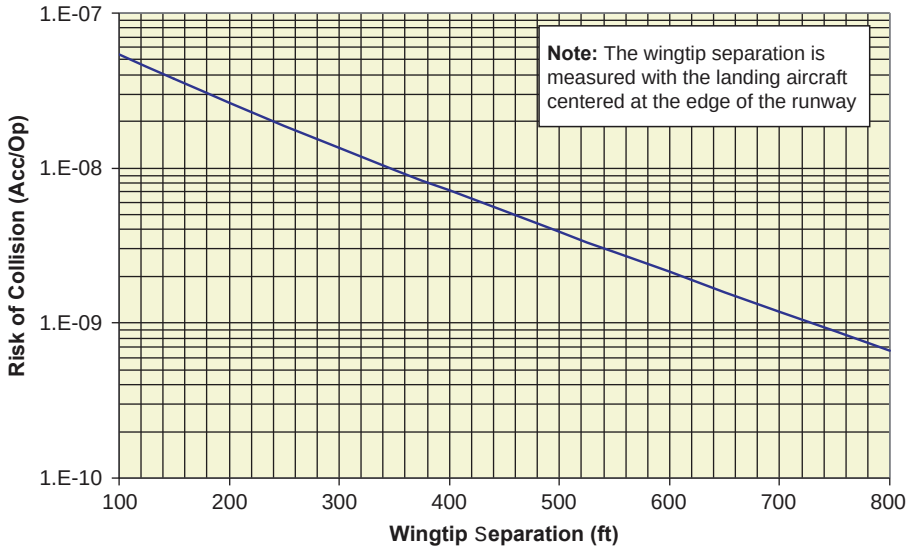


Figure AA-54. Takeoff veer-off collision risk based on wingtip clearance—any ADG.

APPENDIX B

Collision Risk Model

Appendix B of the contractor's final report is not published herein, but is available on the TRB website at http://www.trb.org/Main/Blurbs/165180.aspx.

APPENDIX C

Key Studies on Aircraft Deviation

Appendix C of the contractor's final report is not published herein, but is available on the TRB website at http://www.trb.org/Main/Blurbs/165180.aspx.

APPENDIX D

List of Veer-Off Accidents and Incidents

Appendix D of the contractor's final report is not published herein, but is available on the TRB website at http://www.trb.org/Main/Blurbs/165180.aspx.

APPENDIX E

Sample of Normal Operations Data

Appendix E of the contractor's final report is not published herein, but is available on the TRB website at http://www.trb.org/Main/Blurbs/165180.aspx.

APPENDIX F

Aircraft Database Summary

Table F-1. Summary of aircraft characteristics by model.

Aircraft Name	Manufacturer	I AO ode	in span ft	Len t ft	ei t ft	n ine Type	n ines #	MTO lb	Ta eoff Distance ft	Landin Distance ft	V2 ts	Approac peed ts
Mohawk 298	Aerospatiale	N262	71.9	63.3	20.3	Turboprop	2	23,369	2,296.6	1,312.3	100	110
Aerostar 600	Aerostar	AEST	36.7	34.8	12.8	Piston	2	6,305	1,804.5	1,148.3	95	94
A-300	Airbus	A30B	147.1	177.5	54.3	Jet	2	378,534	7,349.1	5,026.2	160	135
A-300-600	Airbus	A306	147.1	177.5	54.3	Jet	2	378,534	7,349.1	5,026.2	160	135
A-310-200/300	Airbus	A310	144.0	153.1	51.8	Jet	2	330,693	7,513.1	4,888.5	160	135
A-318	Airbus	A318	111.9	103.2	41.2	Jet	2	130,073	4,593.2	4,265.1	135	138
A-319	Airbus	A319	111.9	111.2	38.6	Jet	2	141,096	5,741.5	4,429.1	135	138
A-320	Airbus	A320	111.9	123.3	38.6	Jet	2	162,040	7,185.0	4,724.4	145	138
A-321	Airbus	A321	111.9	146.0	38.6	Jet	2	182,984	7,250.7	5,249.3	145	138
A-330-200	Airbus	A332	197.8	192.9	57.1	Jet	2	507,063	7,545.9	5,905.5	145	140
A-330-300	Airbus	A333	197.8	208.7	55.3	Jet	2	507,063	7,545.9	5,905.5	145	130
A-340-200	Airbus	A342	197.8	194.8	54.8	Jet	4	606,271	9,071.5	5,790.7	145	150
A-340-300	Airbus	A343	197.8	208.7	55.3	Jet	4	606,271	9,071.5	6,003.9	145	150
A-340-500	Airbus	A345	208.2	222.8	56.1	Jet	4	811,301	10,498.7	6,299.2	145	150
A-340-600	Airbus	A346	208.2	247.0	56.8	Jet	4	811,301	10,301.8	6,561.7	145	150
A-380-800	Airbus	A388	261.8	239.5	79.1	Jet	4	1,234,589	9,744.1	6,594.5	150	145
Alenia ATR-42-200/300	ATR	AT43	80.7	74.5	24.9	Turboprop	2	36,817	3,608.9	3,280.8	110	104
Alenia ATR-72-200/210	ATR	AT72	88.9	89.2	25.3	Turboprop	2	47,399	4,921.3	3,608.9	110	105
Avro 748	Avro	A748	98.2	66.9	24.9	Turboprop	2	46,495	3,280.8	2,034.1	110	100
Jetsream 31	Bae Systems	JS31	52.0	47.1	17.5	Turboprop	2	15,562	5,905.5	4,265.1	110	125
Jetsream 32	Bae Systems	JS32	52.0	47.1	17.7	Turboprop	2	16,226	5,150.9	4,002.6	110	125
Jetsream 41	Bae Systems	JS41	60.4	63.4	18.4	Turboprop	2	24,000	4,921.3	4,265.1	110	120
100 ing Air	Beech	BE10	45.9	40.0	15.4	Turboprop	2	11,795	1,476.4	2,132.5	105	111
33 Debonair	Beech	BE33	33.5	25.6	8.2	Piston	1	3,064	1,148.3	984.3	75	70
Beech 55 Baron	Beech	BE55	37.7	27.9	9.5	Piston	2	5,071	1,476.4	1,476.4	95	90
Beech 60 Duke	Beech	BE60	39.4	33.8	12.5	Piston	2	6,768	1,968.5	1,312.3	95	98
Beech 76 Duchess	Beech	BE76	38.1	29.2	9.5	Piston	2	3,902	2,132.5	1,968.5	85	76
Beech 99 Airliner	Beech	BE99	45.9	44.6	14.4	Turboprop	2	16,755	3,280.8	2,952.8	115	107
Bonanza V35B	Beech	BE35	33.4	26.3	7.6	Piston	1	3,400	1,150.0	1,480		70
ing Air F90	Beech	BE9T	45.9	39.8		Turboprop	2	10,950				108

Table F-1. (Continued).

Aircraft Name	Manufacturer	I AO ode	in span ft	Len t ft	ei t ft	n ine Type	n ines #	MTO lb	Ta eoff Distance ft	Landin Distance ft	V2 ts	Approac peed ts
Super ing Air 300	Beech	BE30	54.5	44.0	14.8	Turboprop	2	13,889	1,870.1	1,771.7	115	103
Premier 1A	Beechcraft	PRM1	44.5	46.0	15.3	Jet	2	12,500	3,792.0	3,170.0		121
B707-100	Boeing	B701	130.9	144.7	42.3	Jet	4	190,003	8,694.2	6,496.1		139
B717-200	Boeing	B712	93.2	124.0	29.5	Jet	2	120,999	6,889.8	5,249.3	130	139
B727 Stage 3 Noise Acft	Boeing	B727	107.9	153.2	34.1	Jet	3	210,101	9,842.5	4,921.3	145	150
B727-100	Boeing	B721	108.0	133.2	34.3	Jet	3	169,095	8,202.1	4,921.3		125
B727-200	Boeing	B722	107.9	153.2	34.1	Jet	3	210,101	9,842.5	4,921.3	145	150
B737 Stage 3 Noise Acft	Boeing	B737	93.0	94.0	37.2	Jet	2	110,121	5,905.5	4,593.2	145	137
B737-100	Boeing	B731	93.0	94.0	37.2	Jet	2	110,121	5,905.5	4,593.2	145	137
B737-200	Boeing	B732	93.0	100.2	37.2	Jet	2	115,500	6,003.9	4,593.2	145	137
B737-300	Boeing	B733	94.8	109.6	36.6	Jet	2	124,495	5,249.3	4,593.2	140	135
B737-400	Boeing	B734	94.8	119.4	36.6	Jet	2	138,494	6,561.7	4,921.3	150	139
B737-500	Boeing	B735	94.8	101.7	36.6	Jet	2	115,500	4,921.3	4,593.2	139	140
B737-600	Boeing	B736	112.6	102.5	40.8	Jet	2	123,988	6,233.6	4,265.1	135	125
B737-700	Boeing	B737	112.6	110.3	40.8	Jet	2	146,211	5,905.5	4,593.2	140	130
B737-800	Boeing	B738	112.6	129.5	40.6	Jet	2	155,492	7,545.9	5,249.3	145	141
B737-900	Boeing	B739	112.6	138.2	40.6	Jet	2	174,198	7,545.9	5,577.4	149	144
B747-100	Boeing	B741	195.3	229.0	64.2	Jet	4	735,021	10,465.9	6,233.6	170	152
B747-200	Boeing	B742	195.7	229.0	64.2	Jet	4	826,403	10,498.7	6,233.6	173	152
B747-300	Boeing	B743	195.7	229.0	64.2	Jet	4	826,403	10,826.8	7,217.8	178	160
B747-400	Boeing	B744	195.6	229.2	64.2	Jet	4	874,993	10,826.8	6,988.2	185	154
B747-400ER	Boeing	B744ER	213.0	231.9	64.3	Jet	4	910,002	10,498.7	7,841.2		157
B747-8	Boeing	B748	224.4	246.9	64.3	Jet	4	975,001	10,000.0	8,595.8		159
B757-200	Boeing	B752	124.8	155.2	45.1	Jet	2	255,031	6,233.6	4,593.2	145	135
B757-300	Boeing	B753	124.8	177.4	44.8	Jet	2	272,491	8,530.2	5,905.5	145	142
B767-200	Boeing	B762	156.1	159.2	52.9	Jet	2	395,002	8,858.3	4,921.3	160	130
B767-300	Boeing	B763	156.1	180.2	52.6	Jet	2	412,000	9,514.4	5,905.5	160	130
B767-400	Boeing	B764	170.3	201.3	55.8	Jet	2	449,999	9,514.4	5,905.5	160	150
B767-400ER	Boeing	B764ER	170.3	201.3	55.8	Jet	2	449,999	9,514.4	5,905.5	160	150
B777-200	Boeing	B772	199.9	209.1	61.5	Jet	2	545,005	9,514.4	5,577.4	170	145
B777-200LR	Boeing	B772LR	212.6	209.1	61.5	Jet	2	766,001	9,514.4	5,577.4	170	139
B777-300	Boeing	B773	199.9	242.3	61.5	Jet	2	659,998	9,842.5	5,905.5	168	145

(continued on next page)

Table F-1. (Continued).

Aircraft Name	Manufacturer	I AO ode	in span ft	Len t ft	ei t ft	n ine Type	n ines #	MTO lb	Ta eoff Distance ft	Landin Distance ft	V2 ts	Approac peed ts
B777-300ER	Boeing	B773ER	212.6	242.3	61.8	Jet	2	775,002	9,514.4	5,905.5	160	145
B787-8 Dreamliner	Boeing	B788	197.2	186.1	55.5	Jet	2	484,001				140
BMD-90	Boeing	MD90	107.8	152.6	31.2	Jet	2	164,244	7,217.8	3,937.0	140	140
BD-700 Global Express	Bombardier	GLEX	93.8	99.4	24.9	Jet	2	98,106	6,135.2	1,358.3	120	126
BAC 1-11	British Aerospace	BA11	93.5	107.0	25.4	Jet	2	99,651	7,470.5	4,757.2	140	129
BAE-146-200	British Aerospace	B462	86.4	93.7	28.2	Jet	4	93,035	3,379.3	4,051.8	125	125
CL-600 Challenger	Canadair	CL60	61.8	68.4		Jet	2	47,600				125
RJ-100 Regional Jet	Canadair	CRJ1	69.6	87.9	20.7	Jet	2	47,399	5,249.3	4,593.2	135	135
RJ-200 Regional Jet	Canadair	CRJ2	69.6	87.9	20.7	Jet	2	47,399	5,249.3	4,593.2	135	135
RJ-700 Regional Jet	Canadair	CRJ7	76.2	106.7	24.8	Jet	2	72,753	5,249.3	4,849.1	135	135
RJ-900 Regional Jet	Canadair	CRJ9	76.4	118.8	24.6	Jet	2	80,491	6,168.0	5,118.1	170	150
Aviocar	Casa	C212	66.6	53.1	21.7	Turboprop	2	16,976	2,952.8	1,640.4	100	81
500 Citation	Cessna	C500	47.2	43.6	14.4	Jet	2	10,847	3,274.3	1,870.1	120	125
Cessna 120	Cessna	C120	32.8	21.0		Piston	1	1,450	650.0	460.0		
Cessna 150 Commuter	Cessna	C150	33.5	21.7	6.9	Piston	1	1,499	820.2	656.2	55	55
Cessna 172 Skyhawk	Cessna	C172	35.8	26.9	8.9	Piston	1	2,315	984.3	524.9	60	65
Cessna 182 Skylane	Cessna	C182	36.1	28.2	9.2	Piston	1	2,800	656.2	1,348.4	65	92
Cessna 185 Skywagon	Cessna	C185	36.2	25.8	7.8	Piston	1	3,351	650.0	610.0		
Cessna 206 Caravan 1	Cessna	C208	52.2	37.7	14.1	Turboprop	1	8,001	1,640.4	1,476.4	85	104
Cessna 210 Centurion	Cessna	C210	36.7	28.2	9.8	Piston	1	4,012	1,312.3	1,476.4	70	75
Cessna 340 Rocket	Cessna	C340	38.1	34.4	12.5	Piston	2	5,975	2,132.5	1,640.4	95	110
Cessna 402 Utililiner	Cessna	C402	44.2	36.4	11.8	Piston	2	6,305	2,221.1	1,765.1	95	95
Cessna 404 Titan	Cessna	C404	49.5	39.0	13.1	Piston	2	8,444	2,296.6	1,968.5	100	100
Cessna 414 Chancellor	Cessna	C414	41.0	33.8	11.8	Piston	2	6,746	1,706.0	2,296.6	100	94
Cessna 421 Golden Eagle	Cessna	C421	40.0	33.8	11.8	Piston	2	6,834	1,968.5	2,460.6	100	96
Cessna 425 Corsair	Cessna	C425	44.3	35.8	12.8	Turboprop	2	8,598	2,460.6	2,132.5	105	110
Cessna 441 Conquest	Cessna	C441	49.3	39.0	13.1	Turboprop	2	9,855	1,804.5	1,148.3	105	100
Cessna 500 Citation 1	Cessna	C500	47.2	43.6	14.4	Jet	2	10,847	3,274.3	1,870.1	120	108
Cessna 501 Citation 1SP	Cessna	C501	47.2	43.6	14.4	Jet	2	10,847	3,274.3	1,870.1	120	125
Cessna 525 Citation CJ1	Cessna	C525	46.9	42.7	13.8	Jet	2	10,399	3,080.7	2,749.3	115	107
Cessna 550 Citation 2	Cessna	C550	52.2	47.2	15.1	Jet	2	15,102	3,280.8	3,002.0	115	108

Table F-1. (Continued).

Aircraft Name	Manufacturer	I AO ode	in span ft	Len t ft	ei t ft	n ine Type	n ines #	MTO lb	Ta eoff Distance ft	Landin Distance ft	V2 ts	Approac peed ts
Cessna 560 Citation 5 Ultra	Cessna	C560	45.3	48.9	13.8	Jet	2	15,895	3,159.4	2,919.9	105	108
Cessna 650 Citation 3	Cessna	C650	53.5	55.4	16.8	Jet	2	30,997	5,249.3	2,952.8	125	114
Cessna 750 Citation 10	Cessna	C750	64.0	72.2	19.0	Jet	2	35,699	5,708.7	3,818.9	125	130
Cessna Stationair 6	Cessna	C206	35.8	28.2	9.8	Piston	1	3,638	820.2	1,476.4	75	92
Cessna T303 Crusader	Cessna	C303	39.0	30.5	13.5	Piston	2	5,159	1,748.7	1,460.0	85	110
Cessna T310	Cessna	C310	37.1	31.8	10.8	Piston	2	5,498	1,663.4	1,791.3	95	110
Citation CJ2	Cessna	C25A	49.5	46.9	13.8	Jet	2	12,375	3,418.6	2,985.6	115	118
Citation CJ3	Cessna	C25B	49.5	46.9	13.8	Jet	2	12,375	3,418.6	2,985.6	115	118
Citation Excel	Cessna	C56X	55.8	51.8	17.1	Jet	2	19,200	3,461.3	2,919.9	115	125
Falcon 10	Dassault	FA10	42.9	45.5		Jet	2	18,739				104
Falcon 200	Dassault	FA20	53.5	56.4	17.4	Jet	2	29,013	5,249.3	3,608.9	120	107
Falcon 2000	Dassault	F2TH	63.3	66.3	23.3	Jet	2	35,803	5,249.3	5,249.3	120	114
Falcon 50	Dassault	FA50	61.9	60.8	29.4	Jet	3	38,801	4,593.2	3,608.9	120	113
Falcon 900	Dassault	F900	63.3	66.3	24.9	Jet	3	46,738	4,921.3	2,296.6	125	100
DHC-5 Buffalo	De Havilland Canada	DHC5	65.0	49.5	19.4	Turboprop	2	12,500	1,640.4	984.3	80	77
DHC-7 Dash 7	De Havilland Canada	DHC7	93.2	80.7	26.2	Turboprop	4	47,003	2,952.8	3,280.8	90	83
DHC-8-100 Dash 8	De Havilland Canada	DH8A	85.0	73.2	24.6	Turboprop	2	34,502	2,952.8	2,952.8	100	100
DHC-8-300 Dash 8	De Havilland Canada	DH8C	89.9	84.3	24.6	Turboprop	2	41,099	3,608.9	3,280.8	110	90
DHC-8-400 Dash 8	De Havilland Canada	DH8D	93.2	107.6	27.2	Turboprop	2	63,930	4,265.1	3,608.9	115	115
DC-8 Stage 3 Noise Aircraft	Douglas	DC8	142.4	150.6	42.3	Jet	4	324,961	9,842.5	6,561.7	130	137
DC-8-50	Douglas	DC85	142.4	150.6	42.3	Jet	4	324,961	9,842.5	6,561.7	130	137
DC-8-60	Douglas	DC86	142.4	187.3	42.3	Jet	4	349,874	9,842.5	6,561.7	130	137
DC-8-70	Douglas	DC87	148.3	187.3	43.0	Jet	4	357,204	10,006.6	6,561.7	160	150
DC-9-10	Douglas	DC91	89.6	119.4	27.5	Jet	2	110,099	6,889.8	4,921.3	140	127
DC-9-30	Douglas	DC93	89.6	119.4	27.6	Jet	2	110,099	6,889.8	4,921.3	140	127
DC-9-40	Douglas	DC94	93.5	133.5	28.0	Jet	2	121,109	6,889.8	4,921.3	140	130
DC-9-50	Douglas	DC95	93.5	133.5	27.9	Jet	2	121,109	6,889.8	4,921.3	140	132
DC-9-50	Douglas	DC95	93.5	133.5	27.9	Jet	2	121,109	6,889.8	4,921.3	140	132

(continued on next page)

Table F-1. (Continued).

Aircraft Name	Manufacturer	I AO ode	in span ft	Len t ft	ei t ft	n ine Type	n ines #	MTO lb	Ta eoff Distance ft	Landin Distance ft	V2 ts	Approac peed ts
EMB-110 Bandeirante	Embraer	E110	50.2	46.6	16.1	Turboprop	2	13,007	3,937.0	4,265.1	90	92
EMB-120 Brasilia	Embraer	E120	65.0	65.6	21.0	Turboprop	2	26,455	4,593.2	4,593.2	120	120
EMB-145	Embraer	E145	65.7	98.0	22.2	Jet	2	46,734	6,561.7	4,429.1	130	135
EMB-145XR	Embraer	E45X	68.9	98.0	22.2	Jet	2	46,734	6,561.7	4,429.1	130	135
Embraer 140	Embraer	E140	65.7	93.3	22.1	Jet	2	46,518	6,069.6	4,527.6	130	135
Embraer 175	Embraer	E175	85.3	103.9	31.9	Jet	2	82,673	7,362.2	4,137.1	140	145
Embraer 195	Embraer	E195	94.2	126.8	34.6	Jet	2	107,564	7,149.0	4,206.0	140	145
ERJ-135	Embraer	E135	65.7	86.4	22.2	Jet	2	44,070	5,774.3	4,461.9	125	130
ERJ-170	Embraer	E170	85.3	98.1	32.3	Jet	2	79,344	5,393.7	4,176.5	140	145
ERJ-190	Embraer	E190	94.2	118.9	34.7	Jet	2	105,359	6,745.4	4,340.6	140	145
328 Jet Envoy 3	Fairchild-Dornier	J328	68.8	69.9	23.6	Jet	2	33,510	4,265.1	3,937.0	135	120
Fairchild-Dornier 328	Fairchild-Dornier	D328	68.8	69.3	23.9	Turboprop	2	30,843	3,280.8	3,937.0	110	110
F-27 Friendship	Fokker	F27	95.1	75.8	27.9	Turboprop	2	44,996	2,296.6	1,968.5	100	120
F-28 Fellowship	Fokker	F28	88.8	89.9	27.9	Jet	2	72,995	5,577.4	3,280.8	135	125
Fokker 100	Fokker	F100	92.2	116.5	27.9	Jet	2	95,659	5,577.4	4,593.2	135	130
Fokker 50	Fokker	F50	95.1	82.7	27.2	Turboprop	2	43,982	3,608.9	3,608.9	120	120
Fokker 70	Fokker	F70	95.5	101.4	27.9	Turboprop	2	71,981	4,265.1	3,937.0	125	120
Greyhound C2	Grumman	C2	80.7	57.7	18.4	Turboprop	2	54,426	2,608.3	1,476.4	105	105
695 JetProp Commander 980/1000	Gulfstream Aerospace	AC95	52.2	43.0	15.1	Turboprop	2	11,199	1,640.4	1,640.4	100	500
G-1159 Gulfstream 2	Gulfstream Aerospace	GLF2	68.1	79.1		Jet	2	65,301				141
G-1159A Gulfstream 3	Gulfstream Aerospace	GLF3	77.8	83.0	24.6	Jet	2	69,710	5,905.5	3,280.8	145	136
G-1159C Gulfstream 4	Gulfstream Aerospace	GLF4	77.8	88.3	24.3	Jet	2	73,193	5,249.3	3,280.8	145	128
G-1159D Gulfstream 5	Gulfstream Aerospace	GLF5	93.5	96.5	25.9	Jet	2	90,689	5,150.9	2,900.3	145	145
Ilyushin IL-62	Ilyushin	IL62	141.7	174.2	40.7	Jet	4	363,763	10,826.8	7,545.9	150	152
Ilyushin IL-96	Ilyushin	IL96	197.2	181.4	57.4	Jet	4	595,248	9,186.4	6,561.7	150	150
1124 Westwind	Israel Aerospace Industries	WW24	44.9	52.2	15.7	Jet	2	22,928	4,839.2	2,460.6	125	129

Table F-1. (Continued).

Aircraft Name	Manufacturer	I AO ode	in span ft	Len t ft	ei t ft	n ine Type	n ines #	MTO lb	Ta eoff Distance ft	Landin Distance ft	V2 ts	Approac peed ts
1125 Astra	Israel Aerospace Industries	ASTR	52.8	55.4	18.0	Jet	2	24,648	5,249.3	2,952.8	130	126
1126 Galaxy	Israel Aerospace Industries	GALX	58.1	62.3	21.3	Jet	2	34,851	5,905.5	3,444.9	125	130
Learjet 24	Learjet	LJ24	35.1	43.0		Jet	2	13,001				128
Learjet 25	Learjet	LJ25	35.4	47.6	12.1	Jet	2	14,991	3,937.0	2,952.8	130	137
Learjet 31	Learjet	LJ31	43.6	48.6	12.5	Jet	2	15,498	3,608.9	2,952.8	130	120
Learjet 35	Learjet	LJ35	39.4	48.6	12.1	Jet	2	18,298	4,265.1	2,952.8	140	125
Learjet 35	Learjet	LJ35	39.4	48.6	12.1	Jet	2	18,298	4,265.1	2,952.8	140	125
Learjet 45	Learjet	LJ45	47.9	58.1	14.1	Jet	2	19,511	4,265.1	2,952.8	140	140
Learjet 55	Learjet	LJ55	43.6	55.1	14.8	Jet	2	21,010	4,593.2	3,280.8	140	140
Learjet 60	Learjet	LJ60	44.0	58.7	14.8	Jet	2	23,104	5,249.3	3,608.9	140	140
AC-130 Spectre	Lockheed	C130	132.5	97.8	38.7	Turboprop	4	155,007	3,608.9	2,624.7	120	130
Electra	Lockheed	L188	99.1	104.3	32.8	Turboprop	4	112,987	4,265.1	2,952.8	120	130
L-1011 TriStar	Lockheed	L101	155.5	178.1	55.4	Jet	3	429,990	7,874.0	5,905.5	150	138
P-3 Orion	Lockheed	P3	99.7	116.8	0.0	Turboprop	4	135,000				134
DC-10	McDonnell Douglas	DC10	165.4	180.4	58.1	Jet	3	572,009	9,842.5	5,905.5	150	136
MD-11	McDonnell Douglas	MD11	169.9	200.8	57.7	Jet	3	630,500	10,170.6	6,889.8	160	155
MD-80	McDonnell Douglas	MD80	107.8	147.7	30.2	Jet	3	149,500	6,732.3	5,200.1	140	150
MD-81	McDonnell Douglas	MD81	107.8	147.7	30.2	Jet	3	149,500	6,732.3	5,200.1	140	150
MD-82	McDonnell Douglas	MD82	107.8	147.7	30.2	Jet	3	149,500	6,732.3	5,200.1	140	150
MD-83	McDonnell Douglas	MD83	107.8	147.7	30.2	Jet	3	160,001	6,732.3	5,200.1	140	150
MD-88	McDonnell Douglas	MD88	107.8	147.7	30.2	Jet	3	149,500	6,732.3	5,200.1	140	150
LR-1 Marquise	Mitsubishi	MU2	39.0	33.1	12.8	Turboprop	2	10,053	2,132.5	1,968.5	120	88
Aerostar 200	Mooney	M20P	35.1	23.3	8.2	Piston	1	2,579	1,476.4	820.2	70	70
Observer	Partenavia	P68	39.4	30.8	11.2	Piston	2	4,586	1,312.3	1,968.5	75	73
P-180 Avanti	Piaggio	P180	45.9	47.2	12.8	Turboprop	2	11,552	2,952.8	2,952.8	120	120

(continued on next page)

Table F-1. (Continued).

Aircraft Name	Manufacturer	I AO ode	in span ft	Len t ft	ei t ft	n ine Type	n ines #	MTO lb	Ta eoff Distance ft	Landin Distance ft	V2 ts	Approac peed ts
Astra	Pilatus	PC7	34.1	32.2	10.5	Turboprop	1	6,393	984.3	1,312.3	90	90
Eagle	Pilatus	PC12	53.1	47.2	14.1	Turboprop	1	9,921	1,968.5	1,804.5	110	85
Apache	Piper	PA23	37.0	27.1	10.3	Piston	2	4,799				
Arrow 4	Piper	P28T	35.4	27.2	8.2	Piston	1	2,910	1,148.3	656.2	70	70
Aztec	Piper	PA27	37.4	31.2	10.2	Piston	2	5,203	984.3	1,640.4	75	70
Cherokee Lance	Piper	P32R	36.1	28.2	8.5	Piston	1	3,616	1,640.4	1,804.5	75	75
Cherokee Six	Piper	PA32	36.1	26.9	8.2	Piston	1	3,616	1,640.4	1,804.5	75	75
Cheyenne 2	Piper	PAY2	42.7	36.4	12.8	Turboprop	2	8,995	2,132.5	2,460.6	100	100
Cheyenne 3	Piper	PAY3	47.6	43.3	14.8	Turboprop	2	11,244	2,296.6	2,132.5	105	105
Cheyenne 400	Piper	PAY4	47.6	43.3	17.1	Turboprop	2	12,059	2,296.6	2,132.5	125	110
Comanche	Piper	PA24	36.0	24.1	7.5	Piston	1	2,551				
Malibu Meridian	Piper	P46T	43.0	29.5	11.5	Turboprop	1	4,740	1,476.4	1,476.4	80	75
Malibu Mirage	Piper	PA46	43.0	28.5	11.5	Piston	1	4,299	1,476.4	1,476.4	80	75
Navajo Chieftain	Piper	PA31	40.7	32.5	13.1	Piston	2	6,504	1,312.3	1,968.5	90	100
PA-28-140 Cherokee	Piper	P28A	35.1	24.0	7.2	Piston	1	2,425	984.3	984.3	65	65
PA-28R Cherokee Arrow	Piper	P28R	29.9	24.3	7.9	Piston	1	2,491	984.3	984.3	70	70
Seminole	Piper	PA44	38.7	27.6	8.5	Piston	2	3,792	984.3	1,312.3	75	80
Seneca	Piper	PA34	39.0	28.5	9.8	Piston	2	4,762	984.3	1,312.3	80	80
Tomahawk	Piper	PA38	35.1	23.0	9.2	Piston	1	1,676	820.2	656.2	60	65
Twin Comanche	Piper	PA30	36.0	25.0	8.3	Piston	2	3,600				
400 Beechjet	Raytheon	BE40	43.6	48.6	13.8	Jet	2	16,094	3,937.0	3,608.9	130	111
90 ing Air	Raytheon	BE9L	50.2	35.4	14.1	Turboprop	2	10,099	2,296.6	1,246.7	100	100
Bae 125-1000	Raytheon	H25C	51.5	53.8	17.1	Jet	2	30,997	6,233.6	2,916.7	125	132
Bae 125-700/800	Raytheon	H25B	54.5	51.2	18.0	Jet	2	27,403	5,577.4	2,952.8	125	125
Beech 1900	Raytheon	B190	58.1	57.7	15.4	Turboprop	2	16,954	3,773.0	2,706.7	110	113
Beech 36 Bonanza	Raytheon	BE36	27.6	26.6	8.5	Piston	1	3,638	1,148.3	1,476.4	75	75
Beech 58 Baron	Raytheon	BE58	37.7	29.9	9.7	Piston	2	5,512	2,296.6	1,968.5	100	96
Super ing Air 200	Raytheon	BE20	54.5	44.0	14.8	Turboprop	2	12,500	1,870.1	1,771.7	115	103
Super ing Air 350	Raytheon	B350	58.1	46.6	14.4	Turboprop	2	14,991	3,280.8	2,690.3	120	110
Aero Commander 500	Rockwell International	AC50	48.9	36.7	15.1	Piston	2	6,746	1,312.3	1,312.3	80	97
Sabreliner 60	Rockwell International	SBR1	44.5	48.3		Jet	2	20,000				120

Table F-1. (Continued).

Aircraft Name	Manufacturer	I AO ode	in span ft	Len t ft	ei t ft	n ine Type	n ines #	MTO lb	Ta eoff Distance ft	Landin Distance ft	V2 ts	Approac peed ts
Turbo Commander 680	Rockwell International	AC80	46.8	44.5		Turboprop	2	11,199				97
Turbo Commander 690	Rockwell International	AC90	46.7	44.4	15.0	Turboprop	2	10,251				97
SAAB 2000	SAAB	SB20	81.4	89.6	25.3	Turboprop	2	46,297	4,265.1	4,265.1	110	110
SAAB 340	SAAB	SF34	70.2	64.6	23.0	Turboprop	2	28,440	4,265.1	3,608.9	110	115
C-23 Sherpa	Short	SH33	74.8	58.1	16.4	Turboprop	2	22,597	3,608.9	3,608.9	100	96
SD3-60	Short	SH36	74.8	70.9	24.0	Turboprop	2	27,117	4,265.1	3,608.9	110	100
Short SC-7 Skyvan	Short	SC7	65.0	40.0	15.1	Turboprop	2	13,669	1,968.5	2,296.6	90	90
Fairchild 300	Swearingen	SW3	46.3	42.3	16.7	Turboprop	2	12,566	4,265.1	4,265.1	115	120
Socata TBM-700	TBM	TBM7	40.0	34.1	13.8	Turboprop	1	6,614	2,132.5	1,640.4	85	80

Cells that are blank indicate that no data were available in the databases investigated.

APPENDIX G

Summary of FAA/Boeing Taxiway Deviation Studies

Appendix G of the contractor's final report is not published herein, but is available on the TRB website at http://www.trb.org/Main/Blurbs/165180.aspx.

APPENDIX H

Analysis of MOS Cases

This section summarizes the information collected in the MOS survey and presents results for application of the methodology described in Appendix A to each MOS case. Table H-1 shows the airports included in the MOS survey.

Table 1 Airports included in MO sur ey

ase #	Airport	ID	NPIA	MO Type	FAA Re ion
1	Philadelphia, PA	PHL	LH	TWY/TWY	AEA
2	Anchorage, A	ANC	MH	TWY /OBJ	AAL
3	Addison, TX	ADS	RL	RWY/TWY	ASW
4	Bridgeport, CT	BDR	GA	RWY/TWY	ANE
5	Accomack, VA	MFV	GA	RWY/OBJ	AEA
6	Lincoln Park, NJ	N07	RL	TLN /OBJ	AEA
7	New York JF , NY	JF	LH	TWY/TWY	AEA
8	Newark, NJ	EWR	LH	TWY/TWY*	AEA
9	Minneapolis, MN	MSP	LH	TWY/TWY	AGL
10	Chicago, IL	ORD	LH	TWY/TWY	AGL
11	Chicago, IL	ORD	LH	TWY /OBJ	AGL
12	Barnstable, MA	HYA	NH	RWY/TWY	ANE
13	Laconia, NH	LCI	GA	RWY/TWY	ANE
14	Seattle-Tacoma, WA	SEA	LH	RWY/TWY	ANM
15	Seattle-Tacoma, WA	SEA	LH	TWY/TWY	ANM
16	Aspen, CO	ASE	NH	RWY/OBJ	ANM
17	Nantucket, MA	AC	NH	TWY/TWY	ANE
18	New Castle, DE	ILG	GA	TWY/TWY	AEA
19	Leesburg, VA	JYO	RL	RWY/OBJ	AEA
20	Taunton, MA	TAN	GA	RWY/TWY	ANE

Table H-2 summarizes the cases by type of MOS; the majority of the cases were MOS for runway/taxiway separation and taxiway/taxiway separation.

Table 2 Number of cases for eac MO type

MO Type	Airport	Number of ases
Runway/Taxiway	ADS, ASE, BDR, HYA, LCI, SEA, TAN	7
Taxiway/Taxiway	AC , EWR, JF , MSP, ORD, PHL	6
Runway/Object	JYO, MFV	2
Taxiway/Taxilane	SEA	1
Taxiway/Object	ANC, ILG, N07, ORD	4
	Total	20

Table H-3 summarizes the cases by type of justification used to approve the MOS by the FAA, and Table H-4 presents a summary of the restrictions imposed due to the MOS.

Table ustifications used to obtain MO appro al

MO ustification	Run ay Ta i ay	Ta i ay Ta i ay	Run ay Object	Ta i ay Ta ilane	Ta i ay Object	Total
Advisory Circular acceptable level of safety	2	3	1	1	2	9
Airport facilities capacity	2	2	1	1	2	8
Communications					1	1
Delays/Congestion		2				2
Economic constraints	2		1	1	1	5
Environmental constraints	2		1		1	4
Operations capacity		3	1	1		5
Prior ADG standards compliance	2				1	3
Physical constraints	5	4	1	1	2	13
Runway/Taxiway separation		1				1
Security					1	1

Each MOS may have more than one justification

Table Number of cases for eac MO restriction by MO type

MO Restriction	Run ay Ta i ay	Ta i ay Ta i ay	Run ay Object	Ta i ay Ta ilane	Ta i ay Object	Total
Aircraft exit angle			1			1
Aircraft speed				1		1
Aircraft type/ weight/wingspan	6	4	2	1	2	15
Construction requirements	1					1
Dedicated facility use	1	3				4
Exemption/order terms		1			2	3
Markings and lighting	1	1	1	1	1	5
Operations time of day		1				1
Simultaneous facility operations		1				1
Vehicle type/ dimensions					1	1

Each MOS may have more than one restriction

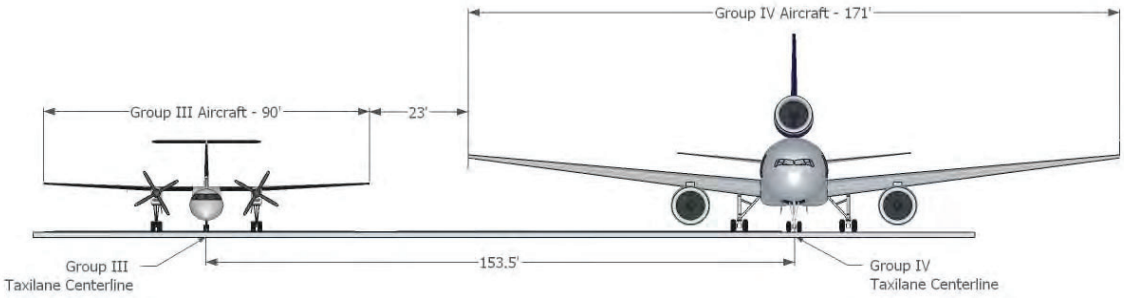
The methodology was applied to each of the 20 MOS cases, and the following sections provide a summary of the issues involved, as well as characterization of the airfield separations. For each case, the methodology developed in this study was applied, and a summary of results is presented.

Case Study #1 - Philadelphia International Airport (PHL)

MO Issue	Taxilane/Taxilane	Appro al Date	6/7/1999
eparations	OFA	Centerline	Wingtip
Standard	423 ft	198 ft	27
Existing	330 ft	153.5 ft	23

Airport Ref ode	C-III and C-IV	
ritical Aircraft	Aircraft 1	Aircraft 2
Model	Dash 8-300	Boeing 767
ADG	III	IV
Wingspan	90	171

ynopsis	One of the parallel taxilanes would be designed to serve only Terminal F (Group III aircraft) while the other taxilane would be designed to serve both Terminals E and F (Group III and IV aircraft). Proposed OFA separation distance is 330 ft.
Restrictions	Use of southernmost taxilane is permitted to Group IV (Boeing B-767) or Group III (Dash 8-300) aircraft. Use of northernmost taxilane is limited to Group III aircraft (Dash 8-300).
ustification	Handle the high traffic volume, minimize delays. Adequate clearance when the northernmost taxilane is limited to commuter aircraft no larger than 90 ft wingspan. Restrict the use of the taxilane to aircraft with wingspans up to 90 ft.
Accidents Incidents	13 accidents and incidents were identified between 1982 and 2009.



Application of Met odolo y

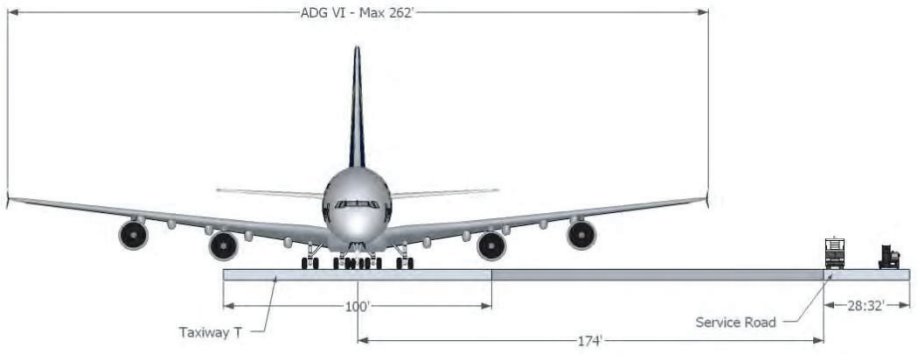
Risk Plot	Figure AA-21	Wingtip Sep	23
Severity	Major	Risk Level	1.0E-09
Conclusion	Low Risk	Acceptable	

Case Study # 2 - Ted Stevens Anchorage International Airport (ANC)

MO Issue	Taxiway/Object	Appro al Date	6/14/2004
eparations	OFA	Centerline	Wingtip
Standard	193 ft	193 ft	62 ft
Existing	174 ft	174 ft	43 ft

Airport Ref ode	D-VI	
ritical Aircraft	Aircraft 1	Aircraft 2
Model	A-380-800	N/A
ADG	VI	
Wingspan	262	

ynopsis	With the introduction of ADG VI (i.e., Airbus 380-800) to the airport operations, ANC proposed to reconstruct Taxiway R and widen it to 100 ft to meet the new ADG requirements. The projected taxiway width left an available taxiway OFA of 174 ft between the centerline of Taxiway R and the tug road vs. the required 193 ft OFA centerline separation based on AC 150/5300-13, Chapter 4, Table 4-1.
Restrictions	Maintain Airbus A388 characteristics as most demanding aircraft. Handle the tug road as an operational item with Antonov 124 aircraft operations.
ustification	Limited space availability; Cost efficiency; Security of airport operations area; Limited communication ability with tug operators; Maintain current level of cargo aircraft parking capacity. Airport already accommodates ADG VI on the existing runways and taxiways.
onditions for Appro al	Tugs and vehicles operating on tug road between Taxiways and T are limited to maximum height of 14 ft. Commuter simulation indicates jet blast from A388 on tug road should not be a problem. If drivers report jet blast related problems, airport authority must submit a proposed mitigation plan.
Accidents Incidents	Nine accidents and incidents were identified between 1982 and 2009.



Application of Met odolo y

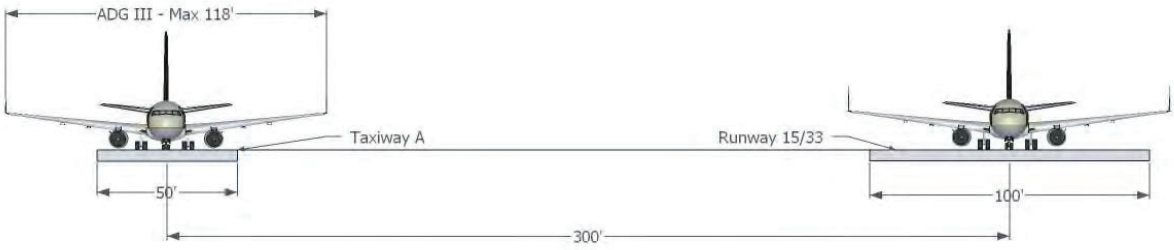
Risk Plot	AA-13	Centerline Sep	174 ft
Severity	Major	Risk Level	1.0E-09
Conclusion	Low Risk	Acceptable	

Case Study # 3 - Addison Airport (ADS)

MO Issue	Runway/Taxiway	Appro al Date	11/18/2008
eparations	OFA	Centerline	Wingtip
Standard		400 ft	282 ft
Existing		300 ft	182 ft

Airport Ref ode	C-III	
ritical Aircraft	Aircraft 1	Aircraft 2
Model	B-737	B-737
ADG	III	III
Wingspan	118	118

ynopsis	The existing separation between Runway 15/33 and parallel Taxiway A is 300 ft, less than the required 400 ft as established in AC 150/5300-13, Chapter 2, Table 2-2 for the airport s ADG III using approach categories C and D. Relocating the parallel taxiway or the runway were not feasible options due to the limited area available to the airport for further development.
Restrictions	Maintain B-737 characteristics as most demanding aircraft.
ustification	Limited area available for relocating either Runway 15/33 or the parallel taxiway due to existing road and industrial developments. Airport safety will not be impeded by the proposed modification to the runway/taxiway separation.
onditions for Appro al	None specified
Accidents Incidents	Two accidents and incidents were identified between 1982 and 2009.



D

Application of Met odolo y

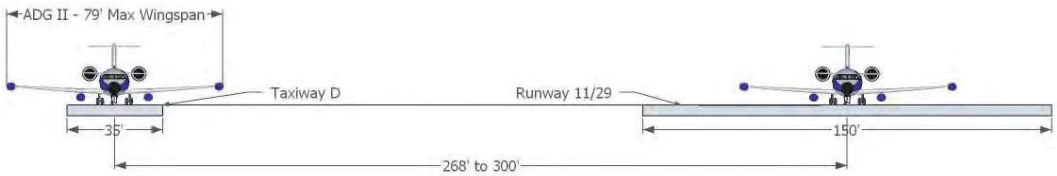
Risk Plot	AA-33 and AA-43	Centerline Sep	300 ft
Severity	Catastrophic	Risk Level Airborne	1.1E-9
		Risk Level Ground	1.0E-7
Annual Vol. Operations	133,600	Expected Years	> 140 years
Conclusion	Medium Risk	Mitigation Recommended	

Case Study # 4 - Igor I. Sikorsky Memorial Airport (BDR)

MO Issue	Runway/Taxiway	Appro al Date	8/04/2003
eparations	OFA	Centerline	Wingtip
Standard		300 ft	221
Existing		268–300 ft (variable)	189–221 ft

Airport Ref ode	C-II	
ritical Aircraft	Aircraft 1	Aircraft 2
Model		
ADG	II	II
Wingspan	Max 79 ft	Max 79 ft

ynopsis	The required separation between runway and taxiway at BDR is specified as 300 ft based on AC 150/5300-13, Chapter 2, Table 2-2. Locating the centerline of 35-ft-wide Taxiway D at the required distance through its length would position the end of the taxiway (i.e., toward the approach end of Runway 11) in a tidal ditch. To avoid the ditch incursion, the taxiway centerline needed to gradually decrease from the required 300 ft to 268 ft. Based on the wingspan dimension of the critical aircraft, it was determined that adequate clearance would remain between the end of Taxiway D and the runway Obstacle Free one (OF). In addition, no part of the critical aircraft would go beyond the 200 ft half-width OF limit for Runway 11/29, which is a modified width permitted for ADG II within category C per AC 150/5300-13, Chapter 3, Table 3-3 notes.
Restrictions	Runway Safety Area for aircraft Approach Category C reduced to 200 ft half-width due to ADG II as per Table 3-3 in AC 150/5300-13.
ustification	Space limitation imposed by a deep tidal ditch. Satisfactory clearance of Runway Safety Area by ADG aircraft.
onditions for Appro al	Location of taxiway holding position at 250 ft from runway centerline.
Accidents Incidents	Two accidents and incidents were identified between 1982 and 2009.



DR

Application of Met odolo y

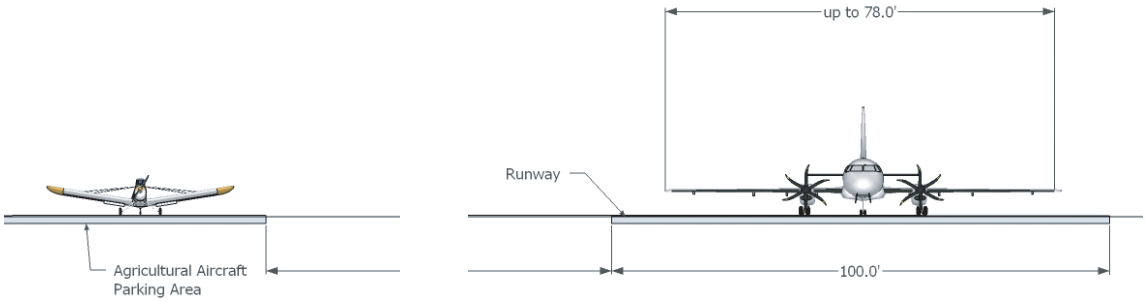
Risk Plot	Plots AA-31 and AA-42	Centerline Sep	268 ft
Severity	Catastrophic	Risk Level Airborne	1.1E-10
		Risk Level Ground	1.1E-7
Annual Vol. Operations	64,000	Expected Years	> 100 years
Conclusion	Medium Risk	Mitigation Recommended	

Case Study # 5 - Accomack County Airport (MFV)

MO Issue	Runway/Object	Appro al Date	12/15/1992
eparations	OFA	Centerline	Wingtip
Standard	400 ft		
Existing	360 ft		

Airport Ref ode	C-II	
ritical Aircraft	Aircraft 1	Aircraft 2
Model		
ADG	II	Parked aircraft
Wingspan	Max 79 ft	Max 79 ft

ynopsis	The aircraft parking area and agricultural storage shed located near the existing terminal building had a separation distance to the runway of 360 and 400 ft, respectively. Based on AC 150/5300-13, Chapter 2, Table 2-2, the standard required runway OFA for a C-II design aircraft is 400 ft, larger than the existing separation of 360 ft between the runway and the parking area.
Restrictions	Maintain type C-II as most demanding aircraft.
ustification	Maintaining aircraft parking and keeping agricultural storage shed facilities operational. Adequate clearance when compared to the available distance between the runway and the terminal building of 360 ft.
onditions for Appro al	None specified
Accidents Incidents	No accidents and incidents were identified between 1982 and 2009.



Application of Met odolo y

Risk Plot	Plots AA-31 and AA-42	Centerline Sep	360 ft
Severity	Catastrophic	Risk Level Airborne	1.0E-09
		Risk Level Ground	5.9E-08
Annual Vol. Operations	13,870	Expected Years	> 100 years
Conclusion	Medium Risk	Mitigation Recommended	

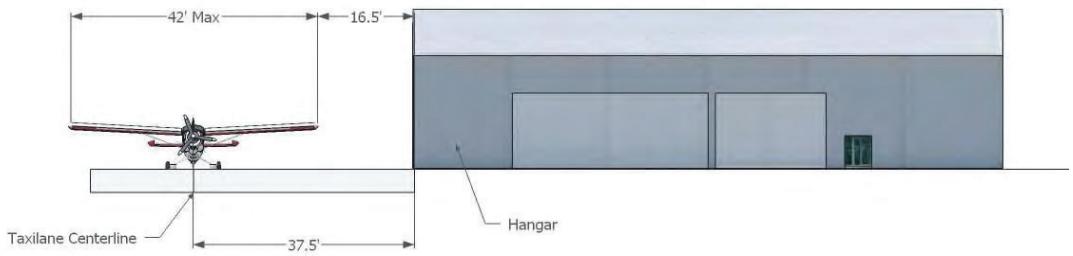
Case Study # 6 - Lincoln Park Airport (N07)

MO Issue	Taxilane/Object	Appro al Date	4/26/2007
eparations	OFA	Centerline	Wingtip
Standard	79 ft		
Existing	75 ft		

Airport Ref ode	D-VI	
ritical Aircraft	Aircraft 1	Aircraft 2
Model	Cessna 414 Chancellor	N/A
ADG	B-I	
Wingspan	41 ft	

ynopsis	The construction of four T-hangar units near the approach end of Runway 19 reduced the taxilane OFA to 75 ft versus the required distance of 79 ft. The location of the T-hangars was constrained by the Riparian Corridor of Middle Ditch, wetlands, and Part 77 surfaces. The proposed location of the hangars was the only place that met those constraints.
Restrictions	Taxiway and hangars should only be used by aircraft with a maximum wingspan of 42 ft.
ustification	Hangars location within the Passaic River Basin and constrained by the Riparian Corridor of Middle Ditch, wetlands, and Part 77 surfaces. Satisfactory OFA clearance when aircraft with wingspan up to 42 ft long travels on the taxilane based on the modified equation found in AC 150/5300-13, Chapter 4, at the bottom of Table 4-1 (1.2 wingspan + 20 ft).

onditions for	Restrict use of taxiway to aircraft with wingspan no greater than 42 ft.
Appro al	
Accidents Incidents	No accidents and incidents were identified between 1982 and 2009.



Application of Met odolo y

Risk Plot	Figure AA-28	Wingtip Sep	16.5 ft
Severity	Major	Risk Level	1.2E-09
Conclusion	Low Risk	Acceptable	

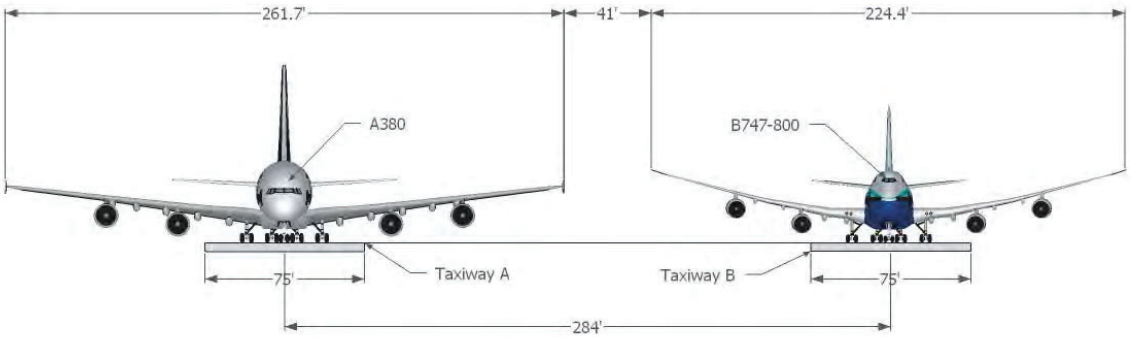
Case Study # 7 - John F. Kennedy International Airport (JFK)

MO Issue	Taxiway/ Taxiway	Appro al Date	3/18/2008 (submitted)
eparations	OFA	Centerline	Wingtip
Standard		324 ft	
Existing		284–300 ft	

Airport Ref ode	D-VI	
ritical Aircraft	Aircraft 1	Aircraft 2
Model	B747-800	B747-800
ADG	VI	VI
Wingspan	224	224

ynopsis	Based on AC 150/5300-13, Chapter 2, Table 2-3, the required taxiway to taxiway centerline separation to accommodate a Boeing B747-8 (i.e., ADG VI) at JF is 324 ft. However, the separations between some taxiways at JF do not comply with the standards. The separation between Taxiways A and B is 284 ft, with the exception of a bridge section in which the separation is 250 ft. The separation between Taxiways P and , R and S, and CE and W is 300 ft. Physical space limitations at JF make it impossible to move the existing runways and/or taxiways to obtain the standard clearances. The option of relocating runways/taxiways would have reduced the runway to taxiway separation or reduced available ramp space, which in turn would have increased ramp congestion and ultimately affected the number of available gate positions.

Restrictions	Restrict simultaneous aircraft operation involving B747-800 aircraft on the bridge section of Taxiways A and B (i.e., bridge crossing the Van Wyck Expressway). Aircraft traveling north should hold on the intersection NA and aircraft traveling south will hold on the intersection with Taxiway NB. Restrict simultaneous aircraft operation involving B747-800 aircraft on Taxiways CA and CB, which separation is also 250 ft.
ustification	Limited space availability. Maintain current level of service without increasing ramp congestion or reducing the available ramp space. Based on the analysis titled *Statistical Extreme Value Analysis Concerning Risk of Wingtip of Fixed Object Collision for Taxiing Large Aircraft*, the 95% confidence interval risk of wingtip collision at JF between an Airbus A-380 and a Boeing B-747-800 on adjacent taxiways with a separation of 267 ft is as low as one in 1 billion. The existing separation between taxiways exceeds 267 ft, with the exception of a bridge section on Taxiways A and B, which separation is 250 ft. The calculated wingtip separation between an Airbus A-380 and a Boeing B747-800 traveling simultaneously on Taxiways A and B was 40 ft, which is greater than the standard taxilane wingtip requirement of 34 ft. Considering the case when the aircraft did not track the taxiway centerlines while taxiing, the wingtip separation was still greater than 10 ft.
Accidents Incidents	15 accidents and incidents were identified between 1982 and 2009.



Application of Met odolo y

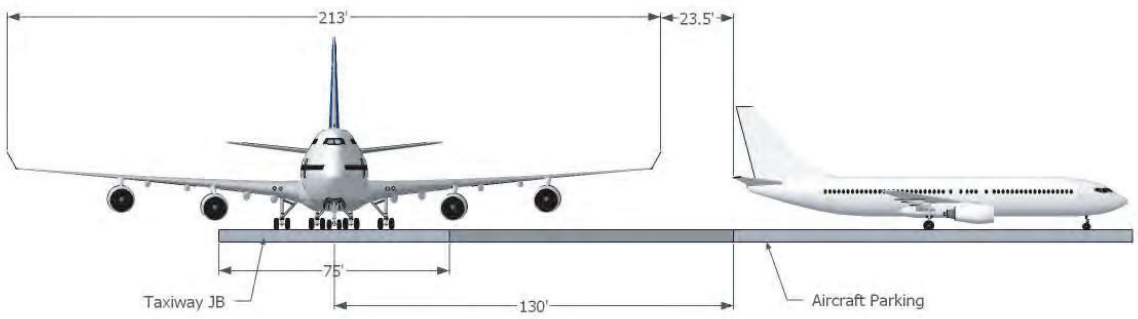
Risk Plot	AA-7	Wingtip Sep	41 ft
Severity	Major	Risk Level	1.0E-09
Conclusion	Low Risk	Acceptable	

Case Study # 8 - Newark Liberty International Airport (EWR)

MO Issue	Taxiway/ Taxiway	Appro al Date	7/28/1995
eparations	OFA	Taxiway/Taxiway	Taxiway/Object
Standard	276 ft	267 ft	138 ft
Existing	260 ft	220 ft	130 ft

Airport Ref ode	D-V	
ritical Aircraft	Aircraft 1	Aircraft 2
Model	B747-400ER	Any
ADG	V	Parked aircraft
Wingspan	213	Any

ynopsis	The FAA standard taxilane OFA width for ADG V is 276 ft. Chapter 2, Table 2-3, of AC 150/5300-13 allows for a modified taxilane centerline to fixed or movable object of 0.6 wingspan + 10 ft which equals 138 ft while the existing separation is as shown in Figure H-8.
Restrictions	Taxiway S use is restricted to B-727 aircraft. This will increase the existing separation of 220 ft to 273 ft (220 + 214/2 −108/2). 273 ft of taxiway separation exceeds the standard requirements. Restrict operations on Taxiway S to B-727 Group III aircraft.
ustification	Based on the modified equation found in AC 150/5300-13, Chapter 2, at the bottom of Table 2-3 (0.6 wingspan + 10 ft), taxiway OFA of 130 ft provided clearance of more than 10 ft from the airplane wingtip to the parked aircraft. Taxiway S restriction allowed for enough clearance between the two taxiways when the largest aircraft expected to travel on Taxiway JB and the largest aircraft allowed in Taxiway S traveled side-to-side.



WR

Application of Met odolo y

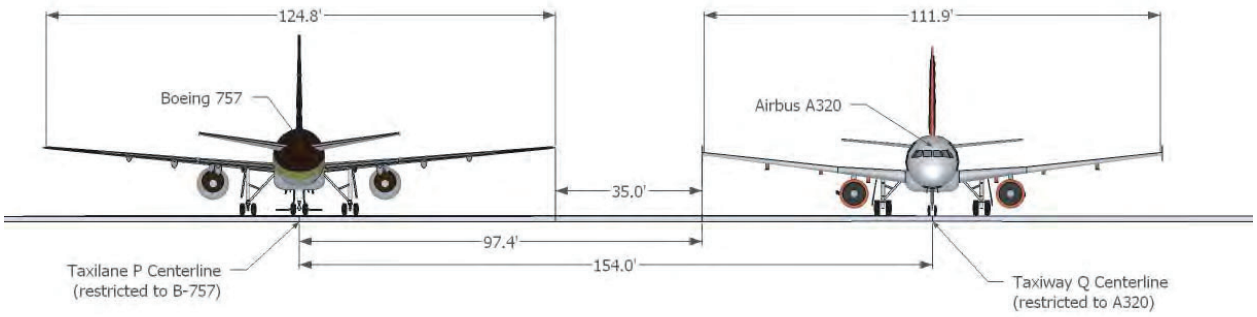
Risk Plot	AA-26 (TLN/OBJ) AA-7 (TWY/TWY)	Wingtip Sep	130 ft (TLN/OBJ) 23.5 ft (TWY/TWY)
Severity	Major	Risk Level	1.0E-09 1.0E-09
Conclusion	Low Risk	Acceptable	

Case Study # 9 - Minneapolis- St. Paul International Airport (MSP)

MO Issue	Taxiway/ Taxiway	Appro al Date	3/6/2006
eparations	OFA	Centerline	Wingtip
Standard		215 ft	
Existing		154 ft	35 ft

Airport Ref ode	C-IV	
ritical Aircraft	Aircraft 1	Aircraft 2
Model	B757-300	B757-300
ADG	IV	IV
Wingspan	125 ft	125 ft

ynopsis	In order to accommodate push-backs from Concourse B and for the aircraft to remain in the non-movement area without blocking Taxiway , a relocation/realignment of Taxiway was required. The proposed MOS was to relocate a portion of Taxiway between P2 and P3, moving it closer to Taxiway P. In order to maintain an acceptable level of safety on the parallel taxiways, the use of the reduced separation segment of Taxiway P was restricted to aircraft with wingspan no larger than 124.8 ft (B-757 size aircraft), and the use of the reduced separation segment of Taxiway was limited to aircraft with wingspans no larger than 111.9 ft (A-320 size aircraft).
Restrictions	Use of Taxiway P between P2 and P3 limited to aircraft with maximum wingspan of 124.8 ft. Use of Taxiway between P2 and P3 limited to aircraft with maximum wingspan of 111.9 ft. Operational restrictions on Taxiways P and to aircraft with wingspan no larger than 124.8 ft and 111.9 ft, respectively. Pavement marking changes to the 30R deicing pad renumbering circle 99 to circle 95. Adjustment to the deicing pad route to allow for a Mesaba staging area and facilitate the regional aircraft operations Concourses A and B. Reduce the painted Taxiway width from 75 ft to 50 ft on the affected segment of the taxiway to ensure object clearance. Change in the current Airport Layout Plan to reflect the changes to the taxiways and operational restrictions. Make regional airlines aware of jet blast issues posed by the proposed Mesaba staging area near the deicing pad. During special circumstances, when aircraft larger than 124.8 ft need to use Runway 12L/30R, parking on the east end of Taxiway P should only be granted if Taxiway is not in use.
ustification	Limited space availability to relocate Taxiway P. The taxiway OFA provides an acceptable level of safety based on the modified equations provided in AC 150/5300-13 below Table 2-3 and Table 4-1. Wingtip clearance of aircraft on both taxiways is acceptable when the aircraft main gear wheels remain entirely within the boundaries of the taxiway.



Application of Met odolo y

Risk Plot	AA-7	Wingtip Sep	35 ft
Severity	Major	Risk Level	1.0E-09
Conclusion	Low Risk	Acceptable	

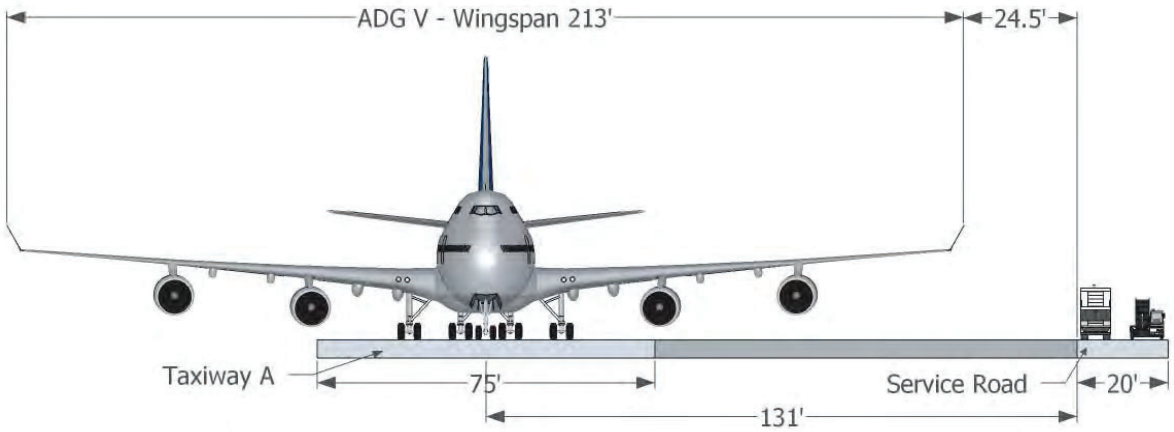
Case Study # 10 - Chicago O'Hare International Airport (ORD)

MO Issue	Taxiway/Object	Appro al Date	9/30/2005
eparations	OFA	Centerline	Wingtip
Standard	160 ft		
Existing	131 ft		

Airport Ref ode	D-V	
ritical Aircraft	Aircraft 1	Aircraft 2
Model	B747-400	N/A
ADG	V	
Wingspan	213	

ynopsis	The existing separation between Taxiway A and the terminal core service road that is located next to Concourses C, E, F, G, and H is 131 ft, while the required taxiway object OFA is 160 ft. At the time the taxiway and terminal were built, the 131-ft OFA complied with ADG V standards. However, these standards have been revised, and AC 150/5300-13, Chapter 2, Table 2-3, now mandates a larger OFA of 160 ft. An MOS was requested to keep the existing taxiway/object separation while subjecting the ADG V operations. Safety was maintained by placing certain operational restrictions on the use of Taxiway A.
Restrictions	Use of Taxiwav A bv ADG V aircraft should be in accordance with the conditions for MOS approval.
ustification	Existing taxiway to object separation was based on ADG V standards at the time of the taxiway and terminal development.

onditions for Appro al	Taxiway A should contain green colored bi-directional centerline lights. Taxiway A centerline lights must be operational during A330, A340, B747-400, MD11, and B777 aircraft operations. Maintain, monitor, and enforce the aircraft parking limit line among all tenants and ground personnel.



RD

Application of Met odolo y

Risk Plot	AA-12	Centerline Sep	131 ft
Severity	Major	Risk Level	3.2E-10
Conclusion	Low Risk	Acceptable	

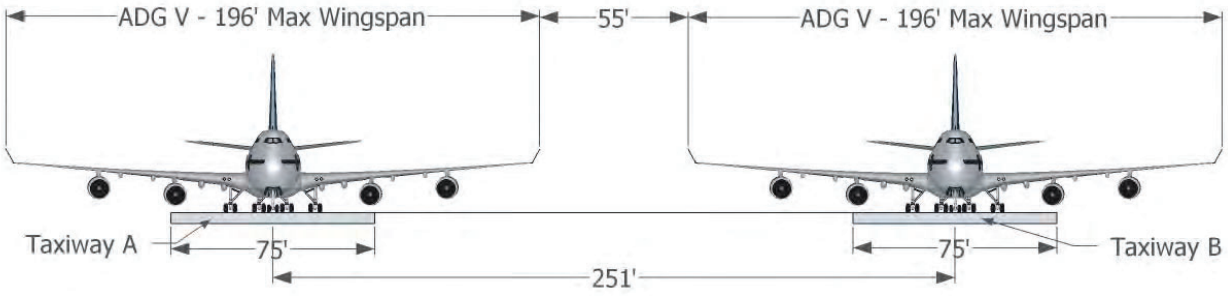
Case Study # 11 - Chicago O'Hare International Airport (ORD)

MO Issue	Taxiway/Taxiway	Appro al Date	9/30/2005
eparations	OFA	Centerline	Wingtip
Standard		267 ft	
Existing		251 ft	

Airport Ref ode	D-V	
ritical Aircraft	Aircraft 1	Aircraft 2
Model	B747-400	B747-400
ADG	V	V
Wingspan	196	196

ynopsis	The existing separation between Taxiways A and B is 251 ft, while the required separation is 267 ft. At the time the taxiways were built, 251 ft complied with the FAA design criteria. However, the standards have been revised and now AC 150/5300-13, Chapter 2, Table 2-3 mandates a larger separation of 267 ft. Operations on Taxiways A and B at ORD are managed by FAA Air Traffic Order ORD 7110.65C with an adequate level of safety. Therefore, after

	evaluating other alternative solutions to the separation between Taxiways A and B, an MOS was requested to keep the existing separation while following the mentioned Air Traffic Order operation restrictions.
Restrictions	In accordance with FAA Air Traffic Order ORD 7110.65C, no simultaneous taxi operations on Taxiways A and B are allowed for B747-400, B777-300, and A340-600 aircraft, and no aircraft is allowed to stop on the Taxiway A or Taxiway B bridges.
ustification	Existing parallel taxiway centerline separation was consistent with the FAA design standards at the time of the taxiways construction. A separation of 251 ft is acceptable subject to the operation restrictions contained in FAA Air Traffic Order ORD 7110.65C.
onditions for Appro al	Taxiway A should contain green colored bi-directional centerline lights. Taxiway A centerline lights must be operational during A330, A340, B747-400, MD11, and all series of B777 aircraft operations. Maintain and observe the aircraft parking limit line. No simultaneous taxi operations on Taxiways A and B are allowed for B747-400, B777-300, and A340-600 aircraft. No aircraft is allowed to stop on the Taxiway A or Taxiway B bridges.



RD

Application of Met odolo y

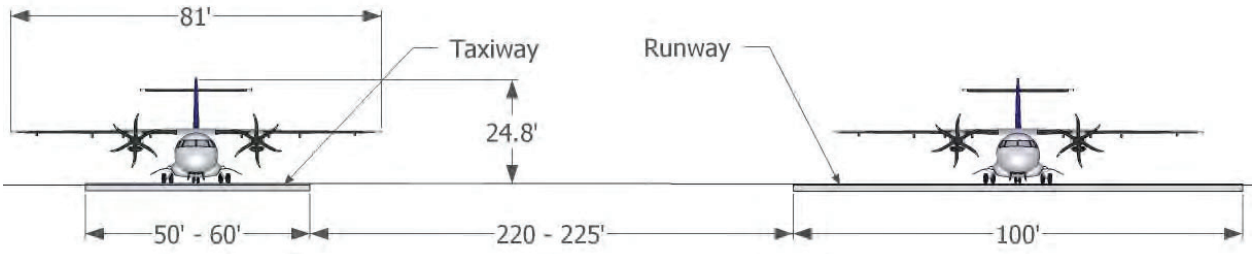
Risk Plot	AA-5	Centerline Sep	251 ft
Severity	Major	Risk Level	1.0E-09
Conclusion	Low Risk	Acceptable	

Case Study # 12 - Barnstable Municipal Airport (HYA)

MO Issue	Runway/Taxiway	Appro al Date	8/17/1998
eparations	OFA	Centerline	Wingtip
Standard		400 ft	282 ft
Existing		300 ft	219 ft
Airport Ref ode	B-III		

ritical Aircraft	Aircraft 1	Aircraft 2
Model	ATR-42	ATR-42
ADG	III	III
Wingspan	81	81

ynopsis	The northern section of Taxiway A, a 20-year old taxiway, was scheduled by HYA for rehabilitation. The existing separation between Taxiway A and Runway 15/33 is 300 ft rather than the required 400 ft by AC 150/5300-13, Chapter 2, Table 2-2. The northern section of Taxiway A is 50 ft in width while the southern section of the taxiway has a width of 60 ft. The width of the taxiway is not an issue since the entire taxiway meets or exceeds the minimum required width of 50 ft. Three options were considered and an MOS request was selected. It was determined that enough clearance space would exist between the existing runway safety area (RSA) and the runway Obstacle Free one, which is offset from the centerline of Runway 15/33 by 250 ft and 200 ft, respectively. The clearing between the RSA and the tip of the wing of the critical aircraft in a 50-ft-wide taxiway was calculated to be 9.7 ft.
Restrictions	Maintain ATR-42 characteristics as most demanding aircraft.
ustification	Cost feasibility. Negative impacts to the airport apron/terminal/parking capacity. Acquisition and cleaning of adjacent contaminated land needed for relocation. Airport design aircraft is less demanding than Group C representative aircraft. The RSA and runway OFA are satisfied utilizing the most demanding aircraft (ATR-42).
onditions for Appro al	Maintaining ATR-42 or less demanding design aircraft



Application of Met odolo y

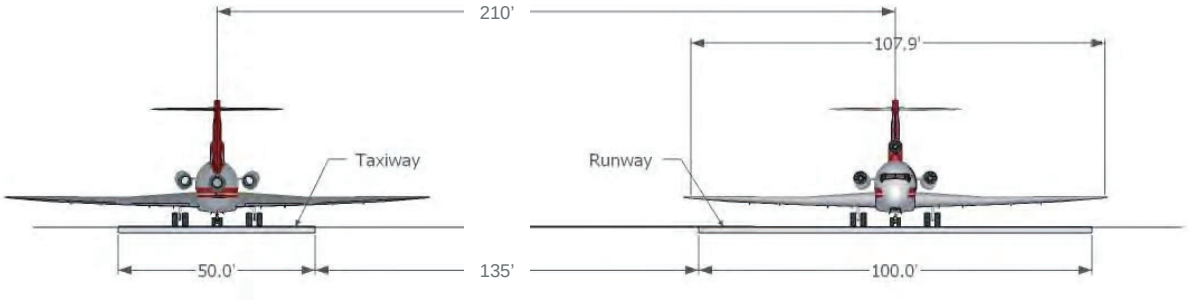
Risk Plot	AA-33 and AA-43	Centerline Sep	
Severity	Catastrophic	Risk Level Airborne	1.1E-09
		Risk Level Ground	1.0E-07
Annual Vol. Operations	118,000	Expected Years	> 100 years
Conclusion	Medium Risk	Mitigation Recommended	

Case Study # 13 - Laconia Municipal Airport (LCI)

MO Issue	Runway/Taxiway	Appro al Date	4/24/1974
eparations	Runway OFA	Taxiway OFA	Centerline
Standard	500 ft	166 ft	400 ft
Existing	300 ft	110 ft	210 ft

Airport Ref ode	C-III	
ritical Aircraft	Aircraft 1	Aircraft 2
Model	B727-200	B727-200
ADG	III	III
Wingspan	108	108

ynopsis	A taxiway measuring 2,700 ft long and 50 ft wide ran parallel to Runway 7/25 (currently labeled as Runway 8/26). The separation between the runway and the existing taxiway was 210 ft, rather than the required 400 ft by AC 150/5300-13, Chapter 2, Table 2-2. Due to economic constraints, the feasible solution to the separation non-compliance was to request an MOS. After a detailed analysis of several representative aircraft, it was determined that the existing separation provided adequate clearance for two critical aircraft (B727-200) traveling side by side in the taxiway and runway, respectively. Maintaining the existing separation of 210 ft as shown in Figure H-13, the clearing between the wing tips of the two aircraft was calculated to be 123 ft. Although the B-727 was listed as the critical aircraft, that aircraft was not operating at the airport at that time. MOS is predicated upon commuter service type aircraft - Piper Apache or a De Havilland Twin Otter. In 2010, LCI does not have a Part 139 certificate, and it is doubtful that in the future it would have any operations by large aircraft such as B-727.
Restrictions	Airport is certified by the Civil Aeronautics Board (CAB) for seasonal service, which is provided by Delta using a Piper Apache as substitute commuter. Basic transportation criteria 150/5300-6 is considered in lieu of air carrier taxiway standards.
ustification	Cost feasibility - taxiway already existed at time the MOS was constructed. Clearance evaluation of two of the most demanding aircraft (B-727-200) passing side-by-side in the runway and taxiway proved satisfactory.
onditions for Appro al	Continued commuter substitute service. Construct taxiway safety area conforming to general aviation transport criteria.



Application of Met odolo y

Risk Plot	AA-33 and AA-43	Centerline Sep	210 ft
Severity	Catastrophic	Risk Level Airborne	5.0E-09
		Risk Level Ground	2.0E-07
Annual Vol. Operations	37,600	Expected Years	> 100 years
Conclusion	Medium Risk	Mitigation Recommended	

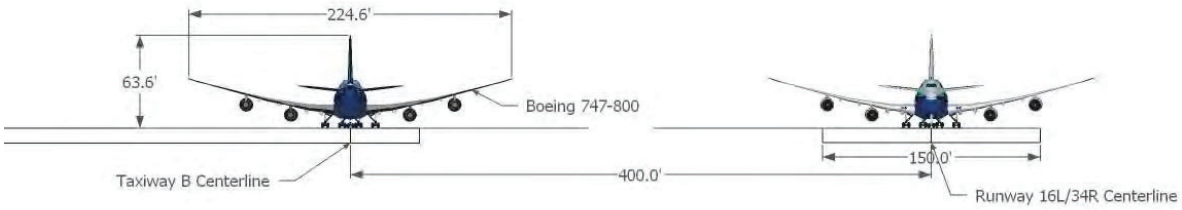
Case Study # 14 - Seattle-Tacoma International Airport (SEA)

MO Issue	Runway/Taxiway	Appro al Date	6/12/2009
eparations	OFA	Centerline	Wingtip
Standard		500 ft and 550 ft	
Existing		400 ft	

Airport Ref ode	D-VI	
ritical Aircraft	Aircraft 1	Aircraft 2
Model	B747-800	B747-800
ADG	VI	VI
Wingspan	224	224

ynopsis	Based on AC 150/5300-13, Chapter 2, Table 2-2, the required runway to taxiway separation at SEA is 400 ft for a CAT I approach, 500 ft for CAT II/III approach with a visibility no lower than statute mile, and 550 ft for CAT II/III approach with a visibility less than statute mile. The existing northernmost section of Taxiway B is located 400 ft east of the approach end of Runway 16L and thus complies with the requirement for CAT I approaches, but provides less than the required separation for CAT II/III approaches. With the introduction of Boeing aircraft model 747-800, the airport s ADG changed from D-V to D-VI, and the required runway to taxiway separation increased from 400 ft to 500 ft–550 ft depending on visibility conditions. The northern 3,000 ft of Taxiway B had an existing tail height restriction of 48 ft for aircraft taxiing on it during CAT II/III approaches. This restriction would also apply to the B747-800. An MOS was requested to allow the B-747-800 to operate on the northern 3,000 ft of Taxiways A and B as had previously been approved for the B-747-400.

Restrictions	Aircraft with a maximum tail height of 48 ft are allowed on the northern 3,000 ft portion of Taxiway B during CAT II and CAT III ILS operations on Runway 16L. Aircraft with tail heights exceeding 48 ft are restricted from operating on Taxiway A during CAT II and CAT III low visibility conditions.
ustification	Current runway to taxiway separation distance complies with prior airport ADG corresponding to D-V (Boeing B747-400). The southern portion of Taxiway B (south of Taxiway L) provides a 600-ft separation between the runway and taxiway centerlines, thus providing an adequate clearance for CAT II and CAT III operations under low visibilities.
onditions for Appro al	B-747-800 aircraft are not allowed to taxi on the northern-most 3,000 ft section of Taxiway B during CAT II/III approaches to Runway 16L since the aircraft s tail height exceeds the 48 ft maximum that had previously been established for operations on that taxiway under those visibility conditions. Taxiway A must be utilized for B-747-800 taxiing when restricted use of Taxiway B is in effect.



Application of Met odolo y

Risk Plot	AA-40 and AA-46	Centerline Sep	
Severity	Catastrophic	Risk Level Airborne	1.5E-06
		Risk Level Ground	1.2E-07
Annual Vol. Operations		Expected Years	> 100 years
Conclusion	High Risk		

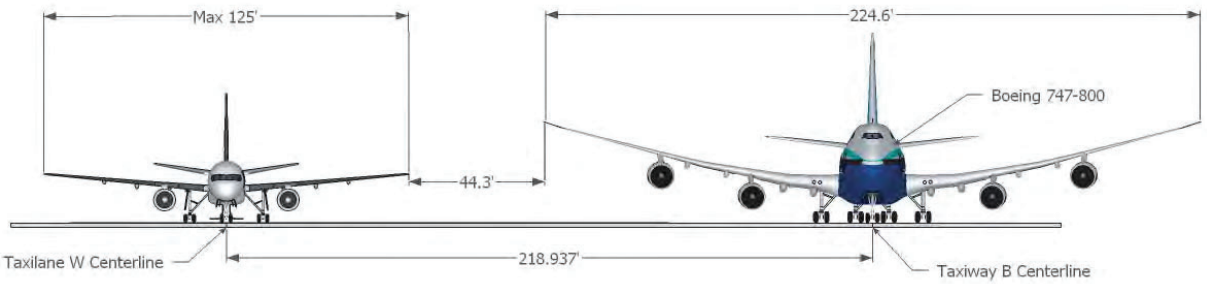
Case Study # 15 - Seattle-Tacoma International Airport (SEA)

MO Issue	Taxiway/Taxilane	Appro al Date	6/2/2009
eparations	OFA	Centerline	Wingtip
Standard		324 ft	62 ft
Existing		219 ft	44.3 ft
Airport Ref ode	D-VI		

ritical Aircraft	Aircraft 1	Aircraft 2
Model	B747-800	B757-200
ADG	VI	IV
Wingspan	224	125

ynopsis	Taxiway B parallels Taxilane W in the passenger terminal area. Taxiway B was designed to comply with ADG V requirements and provide adequate separation for aircraft up to 125 ft wingspan (B757-200). The existing separation between Taxiway B and Taxilane W is 219 ft. Since year 2009, Boeing B747-800 aircraft started operating at SEA, increasing the Airport Reference Code to D-VI and requiring 62 ft wingtip clearance (AC 150/5300-13, Chapter 4, Table 4-3). The only feasible alternative was to limit operations on Taxilane W. An MOS was filed in order to keep the existing spacing configuration and to allow B747-800 aircraft to operate on Taxiway B and aircraft with wingspans up to 125 ft to operate on Taxilane W without restrictions.
Restrictions	Aircraft on Taxilane W should operate at 20 mph or less. Limit operations on Taxiway B to aircraft no larger than 224.4 ft wingspan (Boeing B747-800). Limit operations on Taxilane W to aircraft no larger than 125 ft wingspan (Boeing B757-200). Restrict the use of Taxiway B during pushback of aircraft types B757, ADG IV, and ADG V.
ustification	Cost limitations to relocate Taxiway B to the west of the airport. Limited space and negative impact on the aircraft terminal parking to relocate Taxilane W to the east of the airport. Negative impact on airfield efficiency by restricting the use of Taxilane W to aircraft with wingspans that would provide the required 62 ft wingtip clearance. Using the modified equation on AC 150/5300-13, Chapter 4, at the bottom of Table 4-3, (0.2 wingspan + 10 ft) the average wingtip clearance for an ADG IV taxilane and an ADG VI taxiway required a minimum wingtip separation of 42.3 ft. This distance is less than the available wingtip separation of 44.3 ft between the typical aircraft using Taxiway B (Boeing B747-800) and the typical aircraft using Taxilane W (Boeing B757-200). Statistical studies indicate that B747s are not likely to deviate from centerlines of straight taxiways such as Taxiway B. B747 operations represent less than 1% of the total operations at the airport and the number of operations for B747-800 is a very small portion of the total B747 operations. The probability of having a B747-800 on Taxiway B traveling side-to-side with a B-757 on Taxilane W is very small.

onditions for Appro al	Restrict operations on Taxilane W to aircraft with a maximum wingspan of 125 ft. Aircraft on Taxilane W should operate at 20 mph or less. Maintain the existing taxiway centerline lighting and taxilane centerline reflectors to provide guidance to the pilots during taxi.



Application of Met odolo y

Risk Plot	AA-7	Wingtip Sep	44 ft
Severity	Major	Risk Level	1.0E-09
Conclusion	Low Risk	Acceptable	

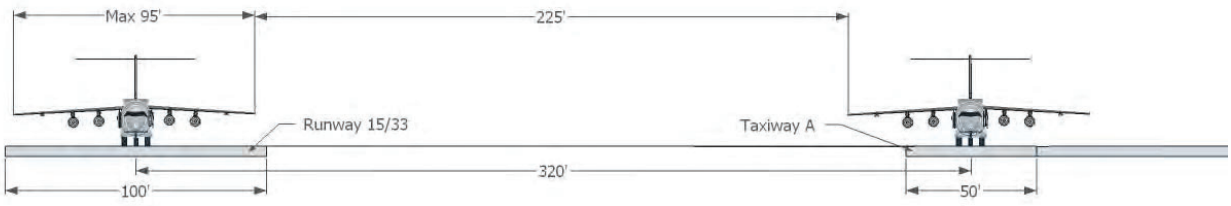
Case Study # 16 - Aspen-Pitkin County Airport (ASE)

MO Issue	Runway/Taxiway	Appro al Date	3/5/1999
eparations	Runway OFA	Taxiway OFA	Centerline
Standard		186 ft	400 ft
Existing		169 ft	320 ft

Airport Ref ode	D-III	
ritical Aircraft	Aircraft 1	Aircraft 2
Model	Grumman Gulfstream IV	Grumman Gulfstream IV
ADG	III	III
Wingspan	78	78

ynopsis	Based on AC 150/5300-13, Chapter 2, Table 2-2, the required runway to taxiway separation at ASE, classified as an ADG D-III airport, is 400 ft. A relocation of the existing taxiway was proposed to increase the runway/taxiway separation from 221.5 ft to 320 ft. Still, the new separation of 320 ft was less than the required 400 ft and thus an MOS was requested. Locating the taxiway at the required 400 ft was not feasible due to the space limitations that Highway 82, the airport frontage road, auto parking lots, and six other buildings posed on the area of interest. The alternative taxiway relocation only impacted the long-term and employee parking and the ARFF building.

	The proposed taxiway alignment was such that the western boundary of the taxiway OFA coincided with the eastern boundary of runway OFA. The width of the OFA on the runway side is 93 ft, which is half of the standard width of taxiway OFA s of 186 ft. However, the location of the relocated taxiway provides an OFA width of 76 ft (93 ft required by standard) between the taxiway and the apron. The apron cannot be relocated due to space constraints identified in preceding paragraph.
Restrictions	Location of airplanes on parking apron should be no closer than 493 ft from the runway centerline. Operations restricted to aircraft with wingspan no larger than 95 ft.
ustification	Lack of space to relocate the existing highway, roads, auto parking, and buildings. Full width taxiway OFA is provided on runway side of the taxiway. Limiting aircraft wing spans to 95 ft provides an adequate taxiway OFA on the apron side in accordance with AC 150/5300-13, Chapter 2, Table 2-3, using the modified formula at the bottom of the table for calculating OF widths for specific aircraft (0.7 wingspan + 10 ft).
onditions for Appro al	Use of the airport restricted to aircraft with wingspan no larger than 95 ft.



Application of Met odolo y

Risk Plot	AA-33, AA-34, and AA-43	Centerline Sep	320 ft
Severity	Catastrophic	Risk Level Airborne	Cat I – 8.5E-10 Cat II – 9.0E-09
		Risk Level Ground	9.0E-08
Annual Vol. Operations	45,000	Expected Years	> 100 years
Conclusion	Medium Risk	Mitigation Recommended	

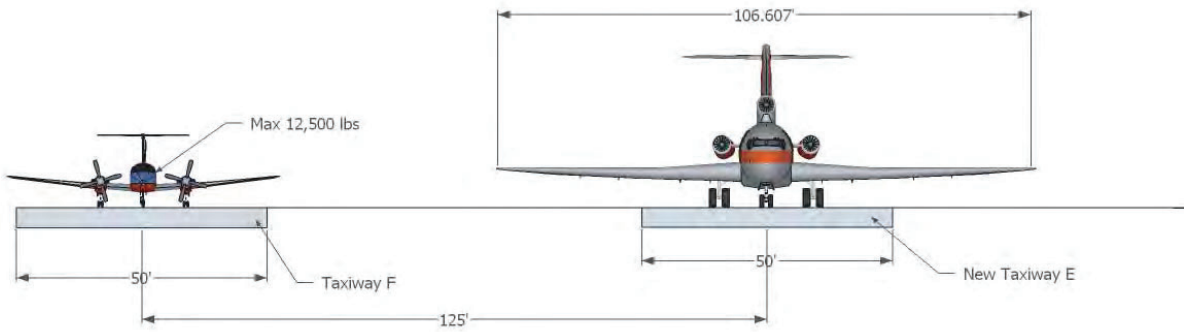
Case Study # 17 - Nantucket Memorial Airport (ACK)

MO Issue	Taxiway/Taxiway	Appro al Date	5/6/1986
eparations	OFA	Centerline	Wingtip
Standard		152 ft	
Existing		125 ft	44 ft

Airport Ref ode	C-III	
ritical Aircraft	Aircraft 1	Aircraft 2
Model		
ADG	III	
Wingspan	107 ft	55 ft

ynopsis	An extension of Taxiway E from Taxiway C (now labeled D) to the approach end of Runway 24 would have caused the existing Taxiway F (extending from the terminal apron to the approach end of Runway 24) to be abandoned because the separation between the new Taxiway E and the existing Taxiway F did not meet standards. Abandoning Taxiway F would have caused a number of problems such as disconnection between the T-hangars and the run-up area; conflict among the north ramp, the main terminal ramp, and the southwest general aviation ramp traffic; and back taxi to achieve full length departure on Runway 15. The Taxiway E extension was located in accordance with standards so that the distance between Taxiway E s centerline and Runway 24 s centerline was 400 ft. This resulted in the separation distance between the parallel Taxiways (E and F) being 125 ft versus the required separation of 153 ft. To avoid abandoning Taxiway F, an MOS to the standard separation between Taxiway E and F was requested. The required parallel taxiway separation for the critical ADG III per AC 150/5300-13, Chapter 2, Table 2-3 was 152 ft. While airport use by these types of aircraft was infrequent at AC , simultaneous operation of aircraft on the parallel Taxiways E and F was still a possibility. Therefore, to maintain an acceptable level of safety, the approval of the MOS was conditioned upon several operational restrictions.
Restrictions	Use restricted by direction of air traffic control. Use restricted to daylight only. Use of Taxiway F restricted to small airplanes (max gross weight of 12,500 lb). Guidance signs unlighted. Existing lighting circuit discontinued. Taxiway safety area grading requirements as per AC 150/5300-12.

ustification	Comply with Runway 6/24 to Taxiway E standard separation. Maintain flexibility of operations and flow by air traffic control during peak traffic conditions. Satisfactory wingtip clearance when no simultaneous operation of ADG III aircraft occurs on the parallel taxiways.
onditions for Appro al	Restrict operations on this portion of the taxiway to daytime. Restrict use of this portion of the taxiway to aircraft of 12,500 lb or less. Maintain this portion of the taxiway unlighted.



Application of Met odolo y

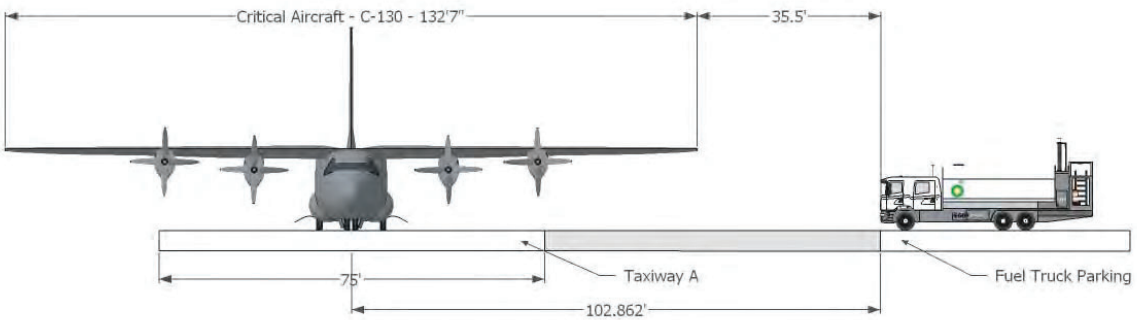
Risk Plot	AA-7	Wingtip Sep	44 ft
Severity	Major	Risk Level	1.0E-09
Conclusion	Low Risk	Acceptable	

Case Study # 18 - New Castle Airport (ILG)

MO Issue	Taxiway/Object	Appro al Date	6/29/2000
eparations	OFA	Centerline	Wingtip
Standard	259 ft	129.5 ft	
Existing	206 ft	103 ft	

Airport Ref ode	D-V	
ritical Aircraft	Aircraft 1	Aircraft 2
Model	AC-130 Spectre	N/A
ADG	IV	
Wingspan	132.5	

ynopsis	The existing separation between Taxiway A and the movement/non-movement area near the aviation hangar located between Taxiways A3 and A4 is 103 ft. The required taxiway OFA width per AC 150/5300-13, Chapter 4, Table 4-1 is 259 ft or 129.5 ft separation between the taxiway centerline and the object. The location between Taxiway A3 and A4 on Taxiway A is designated as a fuel truck parking area. Complying with the required OFA standard would have displaced the parking space and placed the fuel truck too close to the aviation hangar, in violation of fire code. Since there were no other available parking areas for the fuel trucks, a MOS was requested to reduce the separation between the centerline of Taxiway A and the object (i.e., fuel trucks) and thus allow enough clearance between the fuel trucks and the hangar. Reduced separation is based on C-130, the largest aircraft using the airport.
Restrictions	Maintain Hercules C-130 characteristics as most demanding aircraft.
ustification	No other parking area available for aircraft fuel trucks. The required separation would have located the parked fuel trucks too close to the aviation hangar, in violation of fire code. Using the formula (1.4 wingspan + 20) found in AC 150/5300-13, Chapter 4, at the bottom of Table 4-1, the required separation between the taxiway centerline and the object resulted in 103 ft. Calculated clearance of 35.5 ft beyond the critical aircraft (i.e., C130) wingtip and 17.3 ft beyond the safety area edge.
onditions for Appro al	Movement/non-movement line painted at 103 ft from centerline of Taxiway A to delineate the parking limit for the fuel trucks.



Application of Met odolo y

Risk Plot	AA-11	Centerline Sep	103 ft
Severity	Major	Risk Level	2.8E-08
Conclusion	Low Risk	Acceptable	

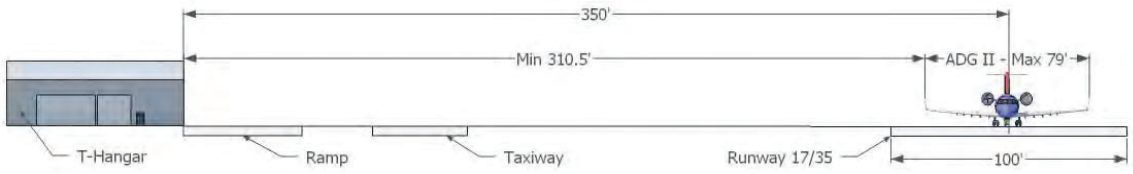
Case Study # 19 - Leesburg Municipal Airport (JYO)

MO Issue	Runway/Object	Appro al Date	3/26/1997
eparations	OFA	Centerline	Wingtip
Standard	800 ft	300 ft	
Existing	750 ft	262.5 ft	

Airport Ref ode	C-II	
ritical Aircraft	Aircraft 1	Object
Model	Grumman Gulfstream III	
ADG	II	
Wingspan	79	

ynopsis	Based on AC 150/5300-13, Chapter 2, Table 2-2, the required runway to taxiway separation at JYO was 300 ft for a C-II aircraft. Locating the parallel taxiway at the required distance would have required one T-hangar unit and two hexagon hangar units to be relocated or reconstructed. In addition to the relocation/reconstruction of the hangars, other existing infrastructure elements such as the taxiway lighting system, the drainage system, a storm water detention facility, and 60,000 square ft of apron would have been impacted. Due to the economic and airport space limitations that redesigning, relocating, and/or reconstructing the existing infrastructure elements would entail, an MOS was requested. Based on AC 150/5300-13, paragraph 209 and Appendix 11, the minimum calculated runway to taxiway separation for ADG II was 239.5 ft and thus the proposed taxiway relocation at 262.5 ft exceeded the minimum requirement. With respect to the runway OFA, AC 150/5300-13, Chapter 3, Table 3-3 requires a width of 800 ft versus the 750 ft existing separation available. However, the hangar structures were outside of the taxiway OFA, the runway safety area (RSA), and the runway object free zone (OF). Besides, following the recommendations of a previous study, the hangar structures were marked with obstruction lights to prevent classifying them as hazards. JYO has only right angle taxiway exits from its runway, and there are not any plans to construct acute angle exits. The 400-ft half-width standard is based on a runway with acute angle exits.
Restrictions	Limit runway and taxiway use to Group II aircraft. Limit Group II aircraft to right-angled exits to assure required turning radii and fillets. Mark the T-hangar and hexagon hangar units with obstruction lights.
ustification	Relocation/reconstruction of one T-hangar unit, two hexagon hangars, the entire taxiway lighting system, and the existing drainage system. Loss of approximately 60,000 of usable apron. Redesign and reconstruction of a storm water detention facility.

	Economic feasibility. Capacity and space limitations. Adequate runway to taxiway clearance for Group II aircraft based on AC 150/5300-13 Appendix 11 calculations. Adequate turning radii and fillets for right-angled exits. Mitigation of penetration hazards by marking the hangars with obstruction lights.
onditions for Appro al	Unconditional approval granted with the specified operational restrictions.



Application of Met odolo y

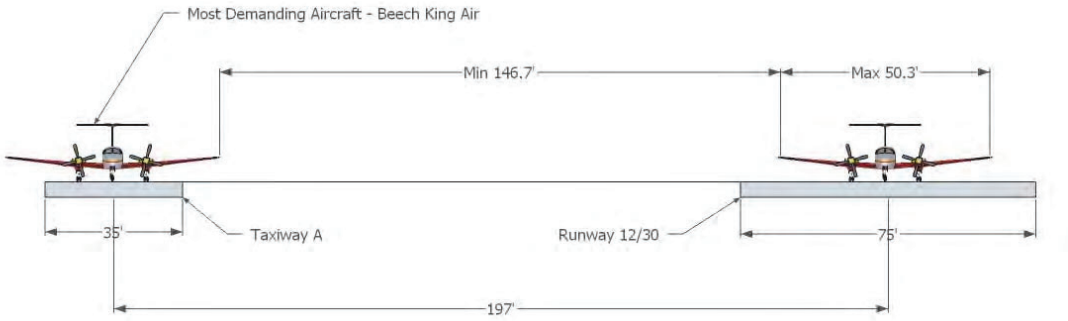
Risk Plot	TWY: AA-31 and AA-42	Centerline Sep	TWY: 262.5 ft OBJ: 375 ft
Severity	Catastrophic	Risk Level Airborne	TWY: 1.2E-10 OBJ: 3.3E-11
		Risk Level Ground	TWY: 1.2E-07 OBJ: 6.0E-08
Annual Vol. Operations	103,700	Expected Years	> 100 years
Conclusion	Medium Risk	Mitigation Recommended	

Case Study # 20 - Taunton Municipal Airport (TAN)

MO Issue	Runway/Taxiway	Appro al Date	6/26/2002 (subm.)
eparations	Runway OFA	Taxiway OFA	Centerline
Standard			240 ft
Existing			197 ft

Airport Ref ode	B-II	
ritical Aircraft	Aircraft 1	Aircraft 2
Model	Beech ing Air C90	Beech ing Air C90
ADG	II	II
Wingspan	50	50

ynopsis	The parallel taxiway to Runway 12/30 was reconstructed in 1960 and its separation from the runway spans 197 ft. In order to comply with the 240 ft separation requirement per AC 150/5300-13, Chapter 2, Table 2-1, a relocation of the taxiway was considered as the primary option. This, however, was not feasible due to the existence of a stream parallel to a portion of the taxiway, and the negative impact on aircraft parking and existing wetlands that a relocation of the parallel taxiway would cause. Therefore, an MOS was requested to keep the existing separation given the fact that the RSA and OF distances provided enough clearance for the critical aircraft operating at the airport (i.e., Beach ing Air C90).
Restrictions	Maintain Beech ing Air C90 characteristics as most demanding aircraft.
ustification	The stream running parallel to a portion of the existing taxiway posed space constraints that made the relocation of the parallel taxiway unfeasible. Negative environmental impacts on the existing wetlands caused by relocating the stream running parallel to a portion of the existing taxiway. Negative impact on aircraft parking caused by relocating the parallel taxiway. The runway safety area and obstacle free zone are satisfied by the critical aircraft, namely a Beech ing Air C90.
onditions for Appro al	Restudy of the proposed MOS if a significant change in aircraft size or volume operations occur at TAN.



Application of Met odolo y

Risk Plot	AA-31 and AA-47	Centerline Sep	197 ft
Severity	Catastrophic	Risk Level Airborne	3.0E-10
		Risk Level Ground	8.0E-08
Annual Vol. Operations	31,400	Expected Years	> 100 years
Conclusion	Medium Risk	Mitigation Recommended	

Abbreviations and acronyms used without definitions in TRB publications:

AAAE	American Association of Airport Executives
AASHO	American Association of State Highway Officials
AASHTO	American Association of State Highway and Transportation Officials
ACI–NA	Airports Council International–North America
ACRP	Airport Cooperative Research Program
ADA	Americans with Disabilities Act
APTA	American Public Transportation Association
ASCE	American Society of Civil Engineers
ASME	American Society of Mechanical Engineers
ASTM	American Society for Testing and Materials
ATA	Air Transport Association
ATA	American Trucking Associations
CTAA	Community Transportation Association of America
CTBSSP	Commercial Truck and Bus Safety Synthesis Program
DHS	Department of Homeland Security
DOE	Department of Energy
EPA	Environmental Protection Agency
FAA	Federal Aviation Administration
FHWA	Federal Highway Administration
FMCSA	Federal Motor Carrier Safety Administration
FRA	Federal Railroad Administration
FTA	Federal Transit Administration
HMCRP	Hazardous Materials Cooperative Research Program
IEEE	Institute of Electrical and Electronics Engineers
ISTEA	Intermodal Surface Transportation Efficiency Act of 1991
ITE	Institute of Transportation Engineers
NASA	National Aeronautics and Space Administration
NASAO	National Association of State Aviation Officials
NCFRP	National Cooperative Freight Research Program
NCHRP	National Cooperative Highway Research Program
NHTSA	National Highway Traffic Safety Administration
NTSB	National Transportation Safety Board
PHMSA	Pipeline and Hazardous Materials Safety Administration
RITA	Research and Innovative Technology Administration
SAE	Society of Automotive Engineers
SAFETEA-LU	Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (2005)
TCRP	Transit Cooperative Research Program
TEA-21	Transportation Equity Act for the 21st Century (1998)
TRB	Transportation Research Board
TSA	Transportation Security Administration
U.S.DOT	United States Department of Transportation

REPORT OF GEOTECHNICAL ENGINEERING SERVICES

Aurora State Airport
Septic Drain Field Improvements for HDSE Sewer System
Aurora, Oregon
Project: AronFA-2-01

For
Aron Faegre and Associates
November 8, 2021

Project: AronFA-2-01

NV5

November 8, 2021

Aron Faegre and Associates
520 SW Yamhill Street, PH1
Portland, OR 97204

Attention: Aron Faegre

Report of Geotechnical Engineering Services
Aurora State Airport
Septic Drain Field Improvements for HDSE Sewer System
Aurora, Oregon
Project: AronFA-2-01

NV5 is pleased to present this report of geotechnical engineering services for subgrade improvements atop a proposed septic drain field for the HDSE sewer system in the runway safety area at the southern end of the Aurora State Airport located in Aurora, Oregon. Our services were conducted in accordance with our proposal dated August 26, 2021.

We appreciate the opportunity to be of continued service to you. Please call if you have questions regarding this report.

Sincerely,

NV5

Brett A. Shipton, P.E., G.E.
Principal Engineer

BAS:sn
Attachments
One copy submitted (via email only)
Document ID: AronFA-2-01-110821-geor.docx
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TABLE OF CONTENTS PAGE NO.

ACRONYMS AND ABBREVIATIONS

1.0 INTRODUCTION 1
2.0 PURPOSE AND SCOPE 1
3.0 SITE CONDITIONS 2
3.1 Soil Sampling 2
3.2 DCP Testing 2
3.3 In Situ Density 3
4.0 PROPOSED DRAIN FIELD 4
5.0 SUBGRADE IMPROVEMENT 4
6.0 LIMITATIONS 5

FIGURES
Vicinity Map Figure 1
Site Plan Figure 2
Soil Classification System Figure 3

APPENDICES
Appendix A
Moisture Density Relationship A-1
Laboratory Test (Modified Proctor) Figure A-1
Laboratory Test (Standard Proctor) Figure A-2
Appendix B
DCP Testing B-1
DCP Test Results
Appendix C
Design Calculations C-1

ACRONYMS AND ABBREVIATIONS

AASHTO	American Association of State Highway and Transportation Officials
ASCE	American Society of Civil Engineers
ASTM	American Society for Testing and Materials
CBR	California bearing ratio
DCP	dynamic cone penetrometer
ESWL	equivalent single wheel load
FAA	Federal Aviation Administration
pcf	pounds per cubic foot
psi	pounds per square inch

1.0 INTRODUCTION

NV5 is pleased to submit this report of geotechnical engineering services for improving the subgrade atop a future drain field located at the southern end of the runway at the Aurora State Airport located in Aurora, Oregon. The same solution could be used for the existing drain fields if needed. Figure 1 shows the site relative to existing physical features.

The proposed drain fields are located in the runway safety area (RSA). The FAA Advisory Circular AC No. 150/5300-13A states that RSA be should be capable, "under dry conditions, of supporting snow removal equipment, aircraft rescue and fire fighting . . . equipment, and the occasional passage of aircraft without causing damage to the aircraft." It also states, "Compaction of RSAs must comply with Specification P-152, Excavation, Subgrade and Embankment, found in AC 150/5370-10."

According to the FAA Airport Construction Standards (AC150/5370-10) Item P-152, the subgrade outside of paved areas must be compacted to at least 95 percent of the maximum dry density, as determined by ASTM D698. No compaction is required in the top 4 inches of the subgrade, and any soil that has become compacted from construction or other traffic in the upper 4 inches must be scarified to a loose state.

From Item P152-2.1:
Areas outside the limits of the pavement areas where the top layer of soil has become compacted by hauling or other Contractor activities shall be scarified and disked to a depth of 4 inches (100 mm), to loosen and pulverize the soil. Stones or rock fragments larger than 4 inches (100 mm) in their greatest dimension will not be permitted in the top 6 inches (150 mm) of the subgrade.

From Item P152-2.6:
"On all areas outside of the pavement areas, no compaction will be required on the top 4 inches (100 mm), which shall be prepared for a seedbed in accordance with Item T-901, T-906."

From Item P152-2.10:
The subgrade in areas outside the limits of the pavement areas shall be compacted to a depth of 12 inches (300 mm) and to a density of not less than 95 percent of the maximum density as determined by ASTM D698.

Such stringent compaction is not permitted in the soil cover of drain fields, and this study provides recommendations for preparing a subgrade in the RSA over the drain fields that is capable, under dry conditions, of supporting snow removal equipment, aircraft rescue and fire fighting equipment, and the occasional passage of aircraft without causing damage to the aircraft.

2.0 PURPOSE AND SCOPE

The purpose of our scope was to provide recommendations for improving the soil cover over the drain fields such that it is capable, under dry conditions and without rigorous compaction, of

supporting snow removal equipment, aircraft rescue and fire fighting equipment, and the occasional passage of aircraft without causing damage to the aircraft. Specifically, we have conducted the following tasks:

- Reviewed information provided to us by Aron Faegre and Associates and other available information in our files.
- Visited the site to observe the subgrade and conduct the following:
  - Collected bulk soil samples in order to establish moisture density relationships in accordance with ASTM D698
  - Measured the in situ density at the location of the proposed drain fields in general accordance with ASTM D6938, Procedure A, using a Troxler 3430 nuclear density gauge
  - Conducted DCP testing in general accordance with ASTM D6951 at the locations shown on Figure 2
- Conducted a laboratory testing program including proctor analyses in accordance with ASTM D698.
- Provided recommendations for subgrade stabilization that do not require significant compaction of the subgrade soil.
- Provided calculations showing that the subgrade atop the proposed drain fields can support emergency vehicles and occasional aircraft.
- Documented our findings, conclusions, and recommendations in this report.

3.0 SITE RECONNAISSANCE

Our site reconnaissance included collecting bulk samples to determine the moisture density relationship of the subgrade soil, conducting DCPs in order to estimate the resilient modulus of the subgrade, and measuring the in situ density of the subgrade soil. Figure 2 shows the locations of sampling and tests.

3.1 SOIL SAMPLING

Bulk soil samples were collected from the near-surface soil in the areas of the future drain fields. A moisture density relationship was determined on a combined bulk sample collected from the surface soil in the area of the proposed drain field. Groundcover at the sampling locations consisted of short grass. The vegetation was removed before sampling, and soil below a depth of 4 inches was placed in a sample bucket and transported to NV5's geotechnical laboratory in Wilsonville, Oregon, for testing. The soil was visually classified as silt in accordance with the soil classification system presented in Figure 3. A moisture density test was performed on the bulk sample in general accordance with ASTM D698. The test results are presented in Appendix A.

3.2 DCP TESTING

We performed DCP testing in general accordance with ASTM D6951 to estimate subgrade resilient modulus (M_r) at the locations shown on Figure 2. The DCP test results are presented on Appendix B. Since it is required that the upper 4 inches of the subgrade be loose, the upper 4 inches of soil was removed before testing was performed. We plotted the depth of penetration versus blow count and used the slope of the data to estimate the resilient modulus of the

subgrade. We correlated the DCP test results to resilient modulus using the methods presented in *The Structural Design of Bituminous Roads*. The computed resilient modulus was converted to CBR using the following relationship:

$CBR = M_r/1500$

Table 1 summarizes the estimated resilient moduli and corresponding CBR for the subgrade.

Table 1. DCP Test Results and Corresponding CBR

Location	Resilient Modulus (psi)	CBR (percent)
DCP-1	24,300	16.2
DCP-2	18,700	12.5
DCP-3	21,200	14.1
DCP-4	14,000	9.3
DCP-5	12,400	8.3
DCP-6	18,000	12.0
DCP-7	10,400	6.9
DCP-8	8,800	5.9

Some of the DCP tests were performed at a depth of 12 inches in order to avoid damaging the drain pipe in the existing drain field.

3.3 IN SITU DENSITY

The in situ density was measured at the locations shown on Figure 2. The density measurements were conducted in accordance with ASTM D6938, Procedure A. Since it is required that the upper 4 inches of the subgrade be loose, the tests were performed deeper than than 4 inches below ground surface. The tests were compared to the maximum dry density determined in the laboratory. Table 2 presents a summary of the in situ density measurements.

Table 2. Measured In Situ Density

Location	Measured Dry Density (pcf)	Measured Moisture Content (percent)	Relative Density ASTM D698 (percent)
D-1	97.0	8.0	92[1]
D-2	89.1	8.3	85[1]
D-3	80.0	6.9	80[2]
D-4	83.4	8.5	84[2]
D-5	109.4	19.7	103[1]
D-6	101.1	21.3	95[1]
D-7	91.1	19.5	92[2]
D-8	87.1	22.4	88[2]

1. Based on a maximum dry density of 105.4 pcf and an optimum moisture content of 18.4 percent
2. Based on maximum dry density of 99.5 pcf and an optimum moisture content of 20.5 percent

We tested the compaction at the existing drain field at locations D-4 and D-8. The other locations were taken randomly throughout the site. The varying degrees of compaction found to exist in the RSA are summarized in Table 1.

Because the FAA's intent is that fire trucks and other vehicles may operate in the RSA, it brings up the question of whether relative compaction definitively relates to the depth of a vehicle rut in the RSA. Although the compaction does not meet the FAA requirement at some locations, the estimated resilient modulus indicates that the subgrade in these areas is capable of supporting similar wheel loads as the areas in which the compaction requirement is met.

4.0 PROPOSED DRAIN FIELD

The proposed drain field consists of a series of subsurface drainage trenches that are approximately 24 inches wide and approximately 3.5 to 4 feet on center. The base of each trench is to have a minimum depth of 18 inches below the capping fill. Twelve inches of ¾- to 2½-inch washed gravel will be placed in the trench. A perforated pipe will be placed in the washed gravel through which the effluent will be drained. A maximum of 10 inches of capping fill will be placed over the trench.

5.0 SUBGRADE IMPROVEMENT

The drain fields are located in the RSA of Aurora State Airport. The FAA Advisory Circular AC No. 150/5300-13A states that the RSA should be capable, ". . . under dry conditions, of supporting snow removal equipment, aircraft rescue and fire fighting . . . equipment, and the occasional passage of aircraft without causing damage to the aircraft." It also states, "Compaction of RSAs must comply with Specification P-152, Excavation, Subgrade and Embankment, found in AC 150/5370-10, which requires that upper 4 inches of the subgrade be uncompacted and scarified to be in a loose state." The underlying 12 inches of subgrade soil should be compacted to at least 95 percent of the maximum dry density, as determined by

ASTM D698. Because a drain field will be beneath the subgrade in the RSA, it cannot be compacted to the standard required by AC 150/5370-10. It must also be capable of growing vegetation.

We have considered the following design vehicles to model emergency equipment and aircraft that may traffic the RSA:

- Emergency Vehicle: AASHTO H20 or a 16,000-pound wheel load
- Aircraft: GulfStream G550 with a gross weight of 91,000 pounds or a 30,300-pound ESWL

To accommodate design traffic, the subgrade located over the drainage trenches should be stabilized using a product such as the Presto GeoSystems Geoweb. We have determined that the GW30V Geocells will create a subgrade that can support both the AASHTO H20 and Gulfstream 550 ESWL with an adequate margin of safety. Our supporting calculations are presented in Appendix C. Table 3 summarizes the input parameters and results of our analysis.

Table 3. Subgrade Stabilization

Design Vehicle	ESWL (pounds)	Tire Pressure (psi)	CBR Beneath Geoweb (percent)	Product Specification	Bearing Capacity Safety Factor
AASHTO H20	16,000	110	5	GW30V 6-inch depth	1.5
Gulfstream 550	30,300	200	5	GW30V 8-inch depth	1.3

A 6-inch-deep cell may be sufficient if the RSA is only subject to ESWLs of 16,000 pounds, such as those of the AASHTO H20 axle load. The geoweb cells should be filled with a blend of two-thirds crushed aggregate and one-third topsoil mix. The crushed aggregate should be 3/8 to 1 inch in nominal diameter and have a D50 of 0.5 inch and a void space of 30 percent. The geoweb should extend beyond each drainage trench by a distance of at least 18 inches. The geoweb should be overfilled by at least 1 inch with the selected fill. In addition, the geoweb should be installed in accordance with the manufacturer's recommendations. A 4-inch layer of loose, uncompacted material can be placed on the improved subgrade to meet the requirement of Item P152-2.6

6.0 LIMITATIONS

We have prepared this report for use by Aron Faegre and Associates and members of the design team for the proposed project. The data and report can be used for bidding or estimating purposes, but our report, conclusions, and interpretations should not be construed as warranty of the subsurface conditions and are not applicable to other sites.

Exploration observations indicate soil conditions only at specific locations and only to the depths penetrated. They do not necessarily reflect soil strata or water level variations that may exist

between exploration locations. If subsurface conditions differing from those described are noted during the course of excavation and construction, re-evaluation will be necessary.

The scope of our services does not include services related to construction safety precautions, and our recommendations are not intended to direct the contractor's methods, techniques, sequences, or procedures, except as specifically described in our report for consideration in design.

Within the limitations of scope, schedule, and budget, our services have been executed in accordance with generally accepted practices in this area at the time our report was prepared. No warranty, express or implied, should be understood.

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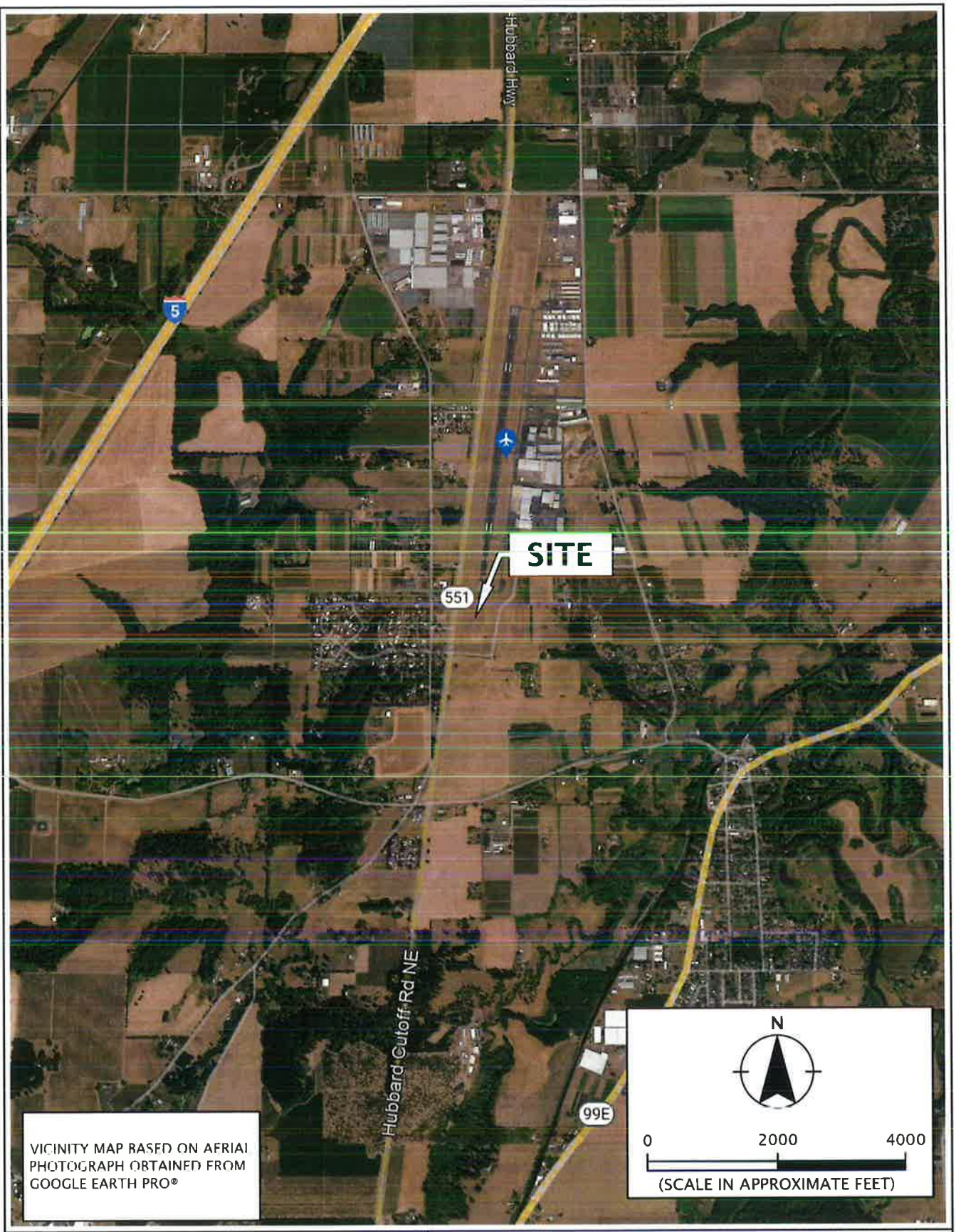
We appreciate the opportunity to be of continued service to you. Please call if you have questions concerning this report or if we can provide additional services.

Sincerely,

NV5

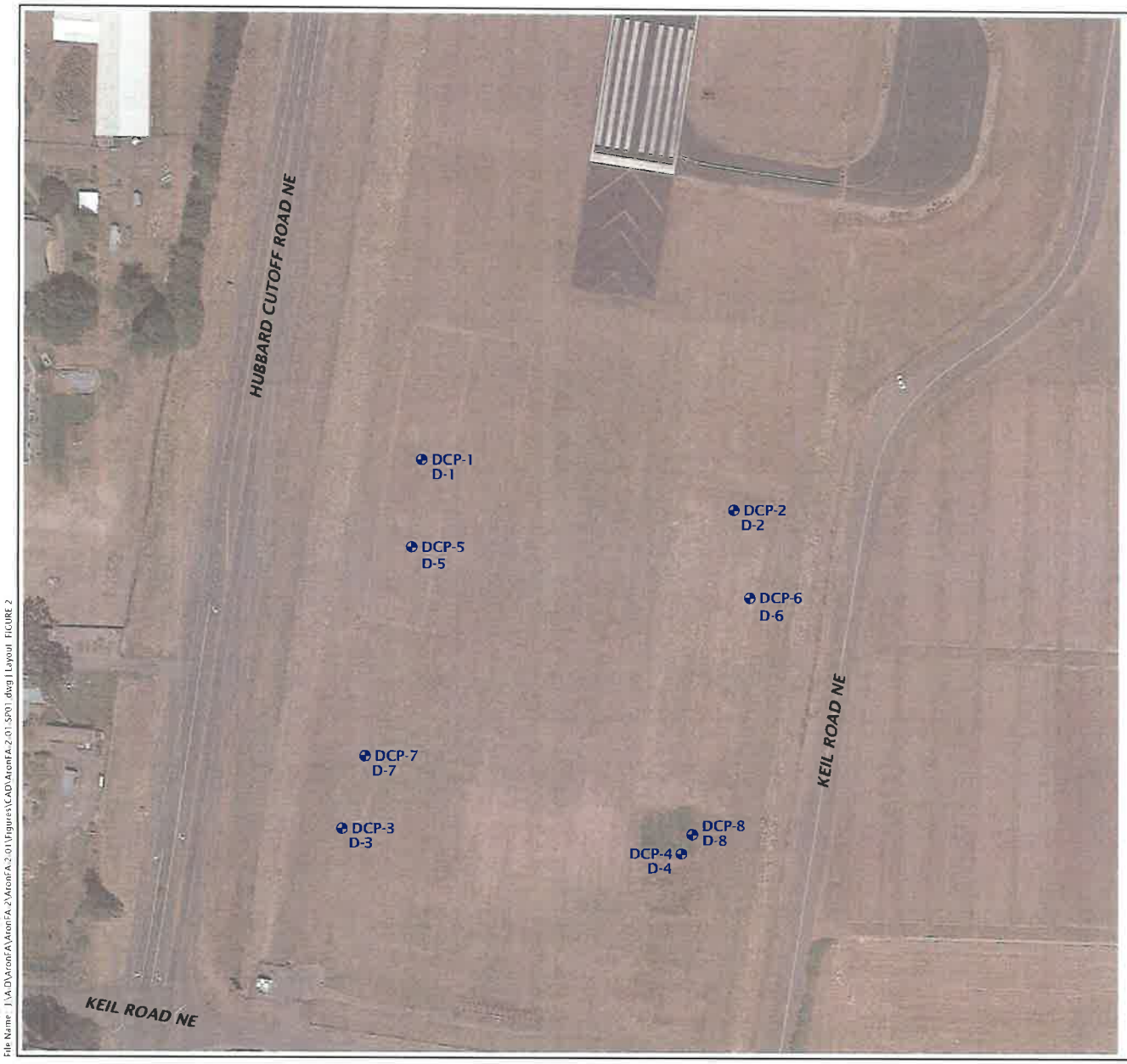
Brett A. Shipton, P.E., G.E.
Principal Engineer





NV5	ARONFA-2-01	VICINITY MAP	
	NOVEMBER 2021	SEPTIC DRAIN FIELD IMPROVEMENTS AURORA, OR	FIGURE 1

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LEGEND:

DCP-1 / D-1 — DCP TEST AND DENSITY MEASUREMENT

N

0 120 240

(SCALE IN FEET)

SITE PLAN BASED ON AERIAL PHOTOGRAPH OBTAINED FROM GOOGLE EARTH PRO© SEPTEMBER 14, 2021

SITE PLAN

SEPTIC DRAIN FIELD IMPROVEMENTS
AURORA, OR

FIGURE 2

ARONFA-2-01

NOVEMBER 2021

NV5

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RELATIVE DENSITY - COARSE-GRAINED SOIL			
Relative Density	**Standard Penetration Test (SPT) Resistance**	**Dames & Moore Sampler (140-pound hammer)**	**Dames & Moore Sampler (300-pound hammer)**
Very loose	0 - 4	0 - 11	0 - 4
Loose	4 - 10	11 - 26	4 - 10
Medium dense	10 - 30	26 - 74	10 - 30
Dense	30 - 50	74 - 120	30 - 47
Very dense	More than 50	More than 120	More than 47

CONSISTENCY - FINE-GRAINED SOIL				
Consistency	**Standard Penetration Test (SPT) Resistance**	**Dames & Moore Sampler (140-pound hammer)**	**Dames & Moore Sampler (300-pound hammer)**	**Unconfined Compressive Strength (tsf)**
Very soft	Less than 2	Less than 3	Less than 2	Less than 0.25
Soft	2 - 4	3 - 6	2 - 5	0.25 - 0.50
Medium stiff	4 - 8	6 - 12	5 - 9	0.50 - 1.0
Stiff	8 - 15	12 - 25	9 - 19	1.0 - 2.0
Very stiff	15 - 30	25 - 65	19 - 31	2.0 - 4.0
Hard	More than 30	More than 65	More than 31	More than 4.0

PRIMARY SOIL DIVISIONS			GROUP SYMBOL	GROUP NAME
COARSE-GRAINED SOIL (more than 50% retained on No. 200 sieve)	GRAVEL (more than 50% of coarse fraction retained on No. 4 sieve)	CLEAN GRAVEL (< 5% fines)	GW or GP	GRAVEL
		GRAVEL WITH FINES (≥ 5% and ≤ 12% fines)	GW-GM or GP-GM	GRAVEL with silt
			GW-GC or GP-GC	GRAVEL with clay
		GRAVEL WITH FINES (> 12% fines)	GM	silty GRAVEL
			GC	clayey GRAVEL
			GC-GM	silty, clayey GRAVEL
	SAND (50% or more of coarse fraction passing No. 4 sieve)	CLEAN SAND (<5% fines)	SW or SP	SAND
		SAND WITH FINES (≥ 5% and ≤ 12% fines)	SW-SM or SP-SM	SAND with silt
			SW-SC or SP-SC	SAND with clay
		SAND WITH FINES (> 12% fines)	SM	silty SAND
			SC	clayey SAND
			SC-SM	silty, clayey SAND
FINE-GRAINED SOIL (50% or more passing No. 200 sieve)	SILT AND CLAY	Liquid limit less than 50	ML	SILT
			CL	CLAY
			CL-ML	silty CLAY
			OL	ORGANIC SILT or ORGANIC CLAY
		Liquid limit 50 or greater	MH	SILT
			CH	CLAY
			OH	ORGANIC SILT or ORGANIC CLAY
HIGHLY ORGANIC SOIL			PT	PEAT

MOISTURE CLASSIFICATION		ADDITIONAL CONSTITUENTS					
		Secondary granular components or other materials such as organics, man-made debris, etc.					
			Silt and Clay In:			Sand and Gravel In:	
Term	**Field Test**	**Percent**	**Fine-Grained Soil**	**Coarse-Grained Soil**	**Percent**	**Fine-Grained Soil**	**Coarse-Grained Soil**
dry	very low moisture, dry to touch						
moist	damp, without visible moisture	< 5	trace	trace	< 5	trace	trace
		5 - 12	minor	with	5 - 15	minor	minor
wet	visible free water, usually saturated	> 12	some	silty/clayey	15 - 30	with	with
					> 30	sandy/gravelly	Indicate %

NV5

SOIL CLASSIFICATION SYSTEM

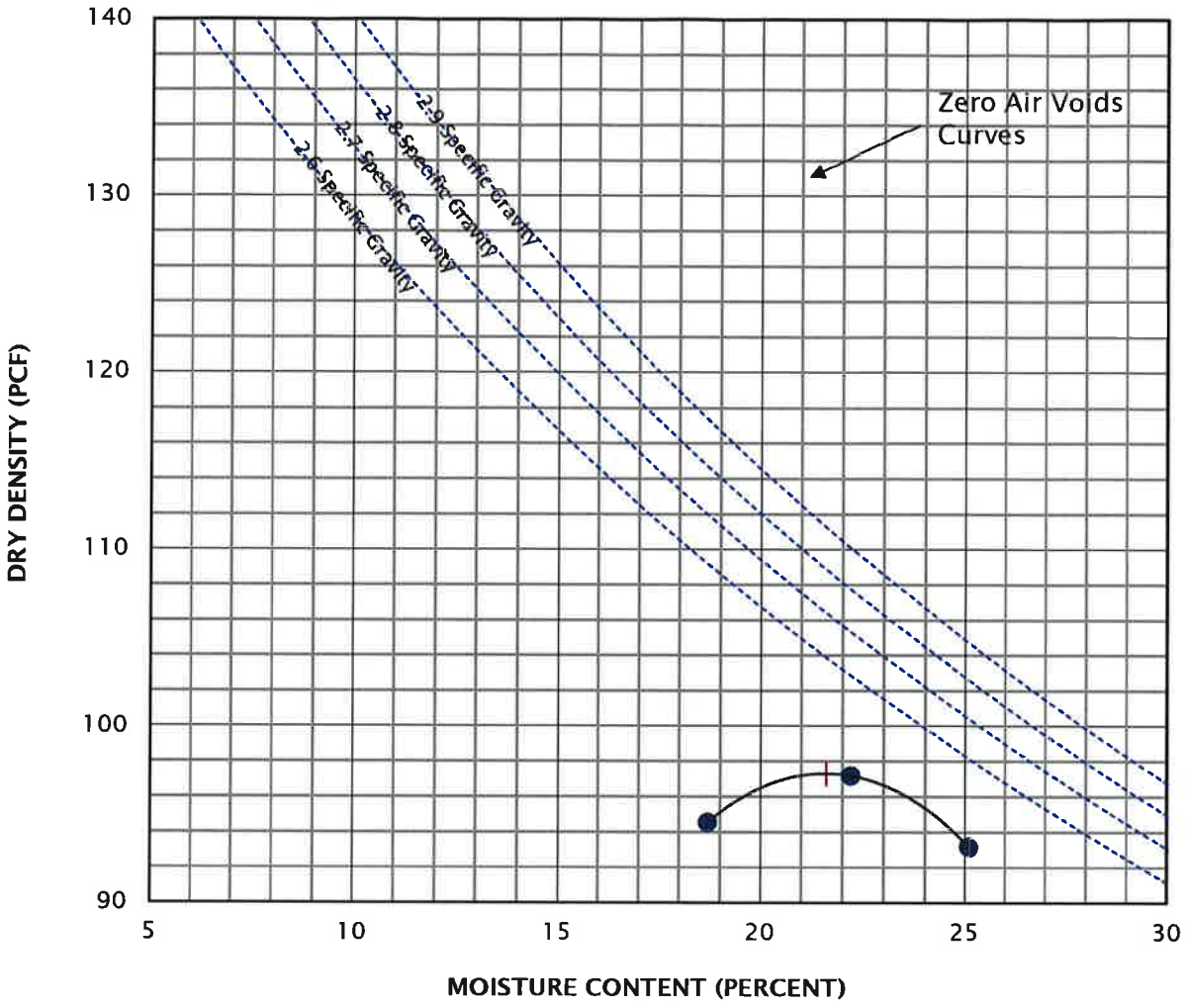
FIGURE 3

APPENDIX A

APPENDIX A

MOISTURE DENSITY RELATIONSHIP

We determined the moisture density relationship of samples collected from the near-surface soil at the location of the proposed drain field in general accordance with ASTM D698. The compaction curves for each sample are presented in this appendix.



EXPLORATION/ LOCATION	DEPTH (FEET)	SOURCE	MATERIAL DESCRIPTION
NA	NA	Onsite	Silt (ML) Existing Drain Fields

TEST RESULTS

TEST METHOD	AS RECEIVED MOISTURE CONTENT (PERCENT)	OVERSIZE (PERCENT)
Standard Proctor-ASTM D698 Method A	22.3	5.6

UNCORRECTED

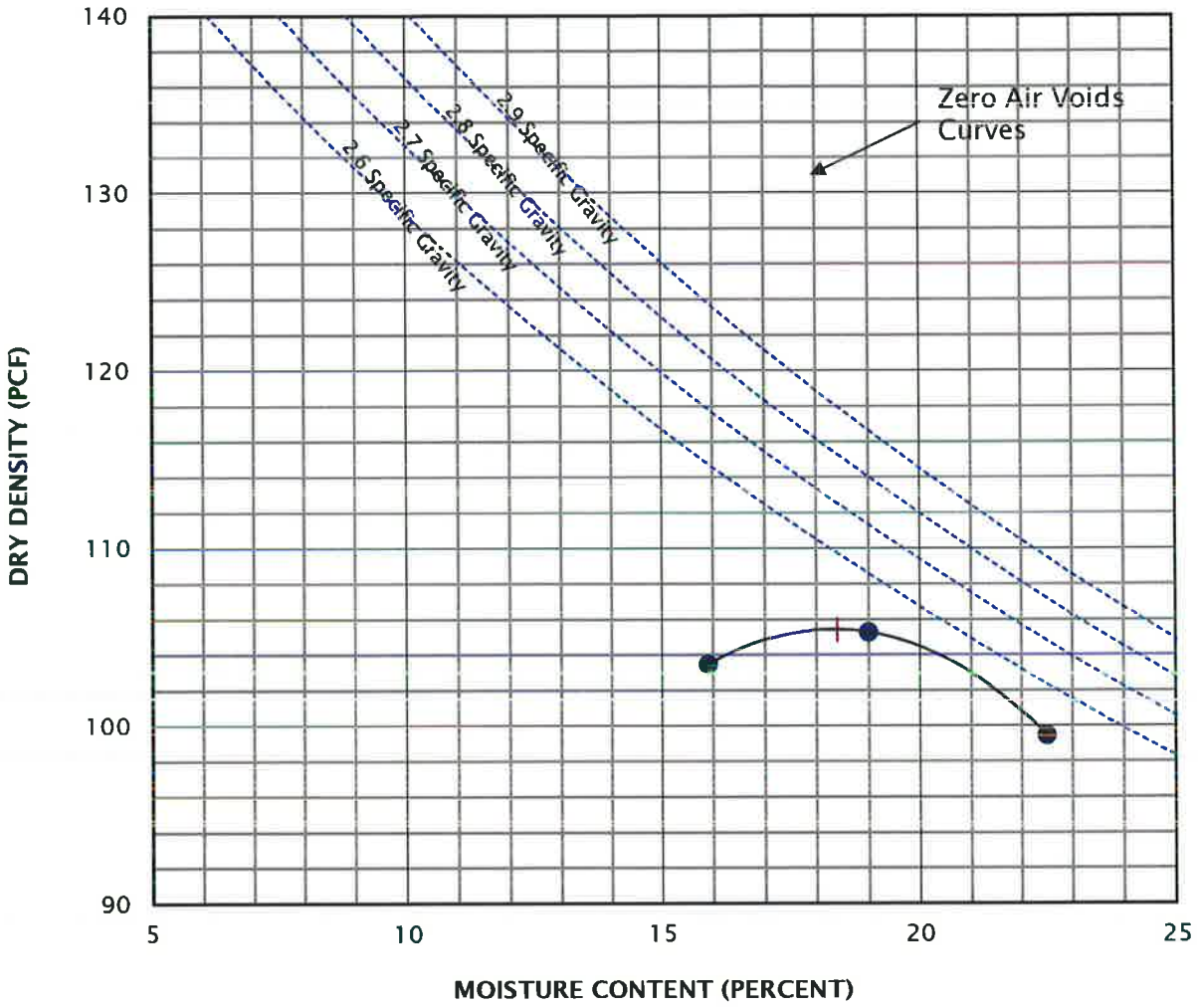
MAXIMUM DRY DENSITY, lb/ft^3	**97.3**
OPTIMUM WATER CONTENT, %	**21.6**

OVERSIZE CORRECTION

MAXIMUM DRY DENSITY, lb/ft^3	**99.5**
OPTIMUM WATER CONTENT, %	**20.5**

NV5	ARONFA-2-01	**LABORATORY TEST (MODIFIED PROCTOR)**	
	NOVEMBER 2021	SEPTIC DRAIN FIELD IMPROVEMENTS AURORA, OR	**FIGURE A-1**

AronFA-2-01-fA1_A2.docx Print Date: 11/2/21



EXPLORATION/ LOCATION	DEPTH (FEET)	SOURCE	MATERIAL DESCRIPTION
NA	NA	Onsite	Silt (ML) Proposed Drain Fields

TEST RESULTS

TEST METHOD	AS RECEIVED MOISTURE CONTENT (PERCENT)	OVERSIZE (PERCENT)
Standard Proctor-ASTM D698 Method A	19.0	0.1

UNCORRECTED

MAXIMUM DRY DENSITY, lb/ft^3	**105.4**
OPTIMUM WATER CONTENT, %	**18.4**

OVERSIZE CORRECTION

MAXIMUM DRY DENSITY, lb/ft^3	**NA**
OPTIMUM WATER CONTENT, %	**NA**

NV5	ARONFA-2-01	**LABORATORY TEST (STANDARD PROCTOR)**	
	NOVEMBER 2021	SEPTIC DRAIN FIELD IMPROVEMENTS AURORA, OR	**FIGURE A-2**

AronFA-2-01-FA1_A2.docx Print Date: 11/2/21

APPENDIX B

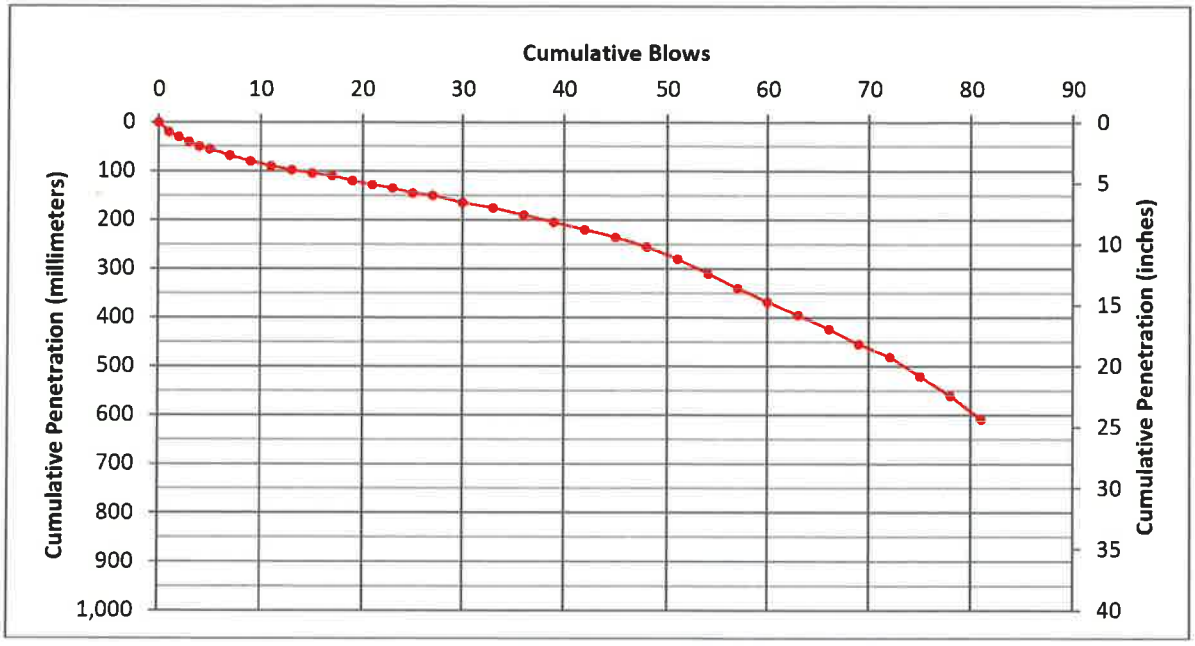
APPENDIX B

DCP TESTING

We performed DCP testing at the locations shown in Figure 2. The tests were performed in general accordance with ASTM D6951. We correlated the DCP test results to resilient modulus using the methods presented in *The Structural Design of Bituminous Roads*. The results of each test are presented in this appendix.

DYNAMIC CONE PENETROMETER RESULTS - DCP 1

Layer	Soil Type	Hammer weight =	17.6 pounds
		Slope (mm/blow)	M_R (psi)
1	Soil not CL, CBR < 10 or not CH	6.9	24,300
2	---	---	---
3	---	---	---



$M_R = 96658 \times S^{-0.7168}$; soil not CL, CBR < 10 or not CH

$M_R = 469673 \times S^{-1.28}$; CL soil, CBR < 10

$M_R = 108206 \times S^{-0.64}$; CH soil

M_R = resilient modulus (pounds per square inch)

S = slope (millimeters per blow); multiplied by two (2) if 10-pound hammer is used

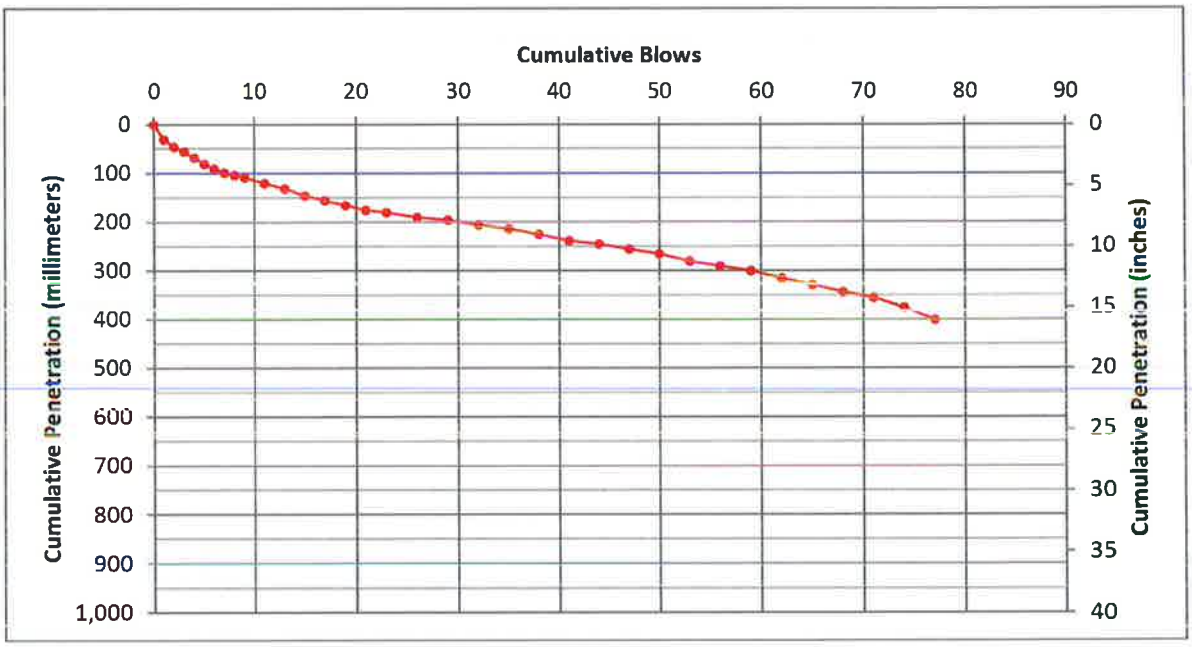
References:

ASTM D 6951, Standard Test Method for Use of the Dynamic Cone Penetrometer in Shallow Pavement Applications.

W.D. Powell, J.F. Foster, H.C. Mayhew, and M.E. Nunn, "The Structural Design of Bituminous Roads," TRRL Laboratory Report 1132, Transport and Road Research Laboratory, Department of Transport, United Kindgom, 1984.

DYNAMIC CONE PENETROMETER RESULTS - DCP 2

Layer	Soil Type	Hammer weight =	17.6 pounds
		Slope (mm/blow)	M_R (psi)
1	Soil not CL, CBR < 10 or not CH	9.9	18,700
2	---	---	---
3	---	---	---



$M_R = 96658 \times S^{-0.7168}$; soil not CL, CBR < 10 or not CH

$M_R = 469673 \times S^{-1.28}$; CL soil, CBR < 10

$M_R = 108206 \times S^{-0.64}$; CH soil

M_R = resilient modulus (pounds per square inch)

S = slope (millimeters per blow); multiplied by two (2) if 10-pound hammer is used

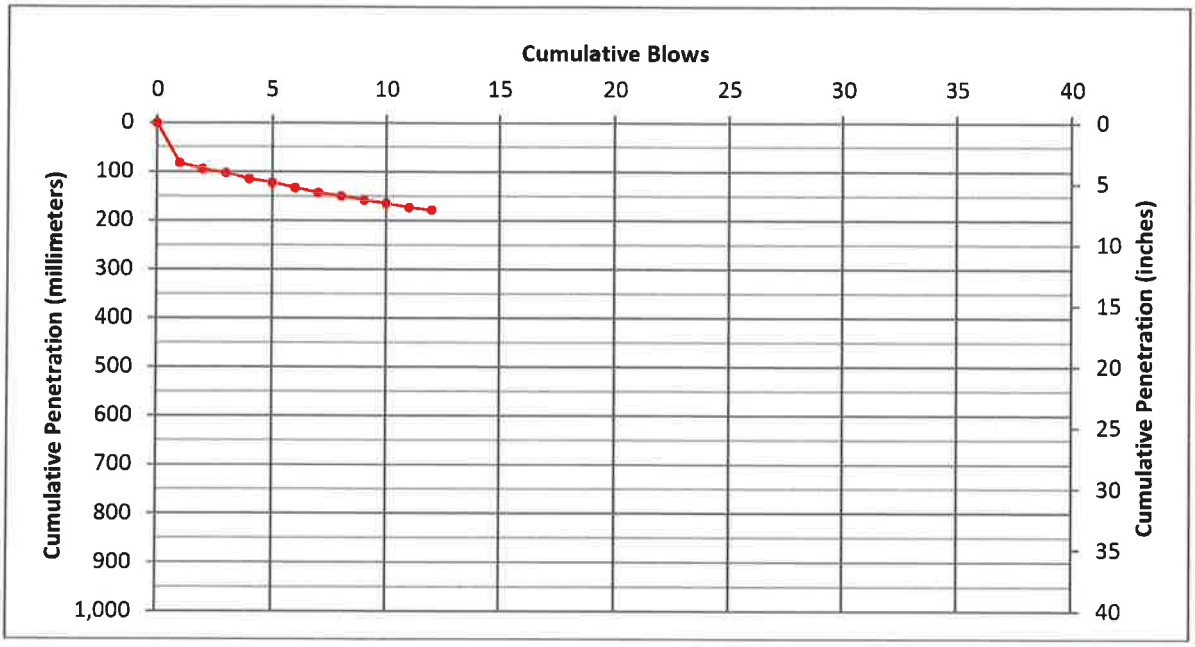
References:

ASTM D 6951, Standard Test Method for Use of the Dynamic Cone Penetrometer in Shallow Pavement Applications.

W.D. Powell, J.F. Foster, H.C. Mayhew, and M.E. Nunn, "The Structural Design of Bituminous Roads," TRRL Laboratory Report 1132, Transport and Road Research Laboratory, Department of Transport, United Kindgom, 1984.

DYNAMIC CONE PENETROMETER RESULTS - DCP 3

Layer	Soil Type	Hammer weight =	17.6 pounds
		Slope (mm/blow)	M_R (psi)
1	Soil not CL, CBR < 10 or not CH	8.3	21,200
2	---	---	---
3	---	---	---



$M_R = 96658 \times S^{-0.7168}$; soil not CL, CBR < 10 or not CH

$M_R = 469673 \times S^{-1.28}$; CL soil, CBR < 10

$M_R = 108206 \times S^{-0.64}$; CH soil

M_R = resilient modulus (pounds per square inch)

S = slope (millimeters per blow); multiplied by two (2) if 10-pound hammer is used

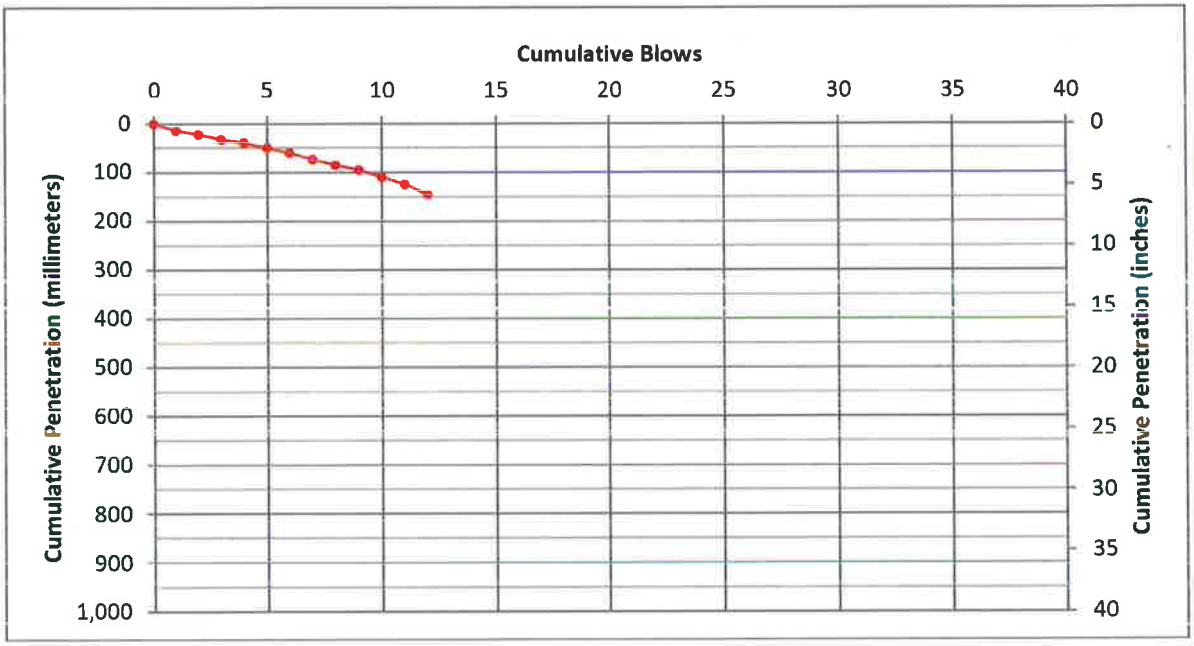
References:

ASTM D 6951, Standard Test Method for Use of the Dynamic Cone Penetrometer in Shallow Pavement Applications.

W.D. Powell, J.F. Foster, H.C. Mayhew, and M.E. Nunn, "The Structural Design of Bituminous Roads," TRRL Laboratory Report 1132, Transport and Road Research Laboratory, Department of Transport, United Kindgom, 1984.

DYNAMIC CONE PENETROMETER RESULTS - DCP 4

Layer	Soil Type	Hammer weight =	17.6 pounds
		Slope (mm/blow)	M_R (psi)
1	Soil not CL, CBR < 10 or not CH	14.8	14,000
2	---	---	---
3	---	---	---



$M_R = 96658 \times S^{-0.7168}$; soil not CL, CBR < 10 or not CH

$M_R = 469673 \times S^{-1.28}$; CL soil, CBR < 10

$M_R = 108206 \times S^{-0.64}$; CH soil

M_R = resilient modulus (pounds per square inch)

S = slope (millimeters per blow); multiplied by two (2) if 10-pound hammer is used

References:

ASTM D 6951, Standard Test Method for Use of the Dynamic Cone Penetrometer in Shallow Pavement Applications.

W.D. Powell, J.F. Foster, H.C. Mayhew, and M.E. Nunn, "The Structural Design of Bituminous Roads," TRRL Laboratory Report 1132, Transport and Road Research Laboratory, Department of Transport, United Kindgom, 1984.

DYNAMIC CONE PENETROMETER RESULTS - DCP 5

Layer	Soil Type	Hammer weight =	17.6 pounds
		Slope (mm/blow)	M_R (psi)
1	Soil not CL, CBR < 10 or not CH	17.6	12,400
2	---	---	---
3	---	---	---



$M_R = 96658 \times S^{-0.7168}$; soil not CL, CBR < 10 or not CH

$M_R = 469673 \times S^{-1.28}$; CL soil, CBR < 10

$M_R = 108206 \times S^{-0.64}$; CH soil

M_R = resilient modulus (pounds per square inch)

S = slope (millimeters per blow); multiplied by two (2) if 10-pound hammer is used

References:

ASTM D 6951, Standard Test Method for Use of the Dynamic Cone Penetrometer in Shallow Pavement Applications.

W.D. Powell, J.F. Foster, H.C. Mayhew, and M.E. Nunn, "The Structural Design of Bituminous Roads," TRRL Laboratory Report 1132, Transport and Road Research Laboratory, Department of Transport, United Kindgom, 1984.

DYNAMIC CONE PENETROMETER RESULTS - DCP 6

Layer	Soil Type	Hammer weight =	17.6 pounds
		Slope (mm/blow)	M_R (psi)
1	Soil not CL, CBR < 10 or not CH	10.4	18,000
2	---	---	---
3	---	---	---



$M_R = 96658 \times S^{-0.7168}$; soil not CL, CBR < 10 or not CH

$M_R = 469673 \times S^{-1.28}$; CL soil, CBR < 10

$M_R = 108206 \times S^{-0.64}$; CH soil

M_R = resilient modulus (pounds per square inch)

S = slope (millimeters per blow); multiplied by two (2) if 10-pound hammer is used

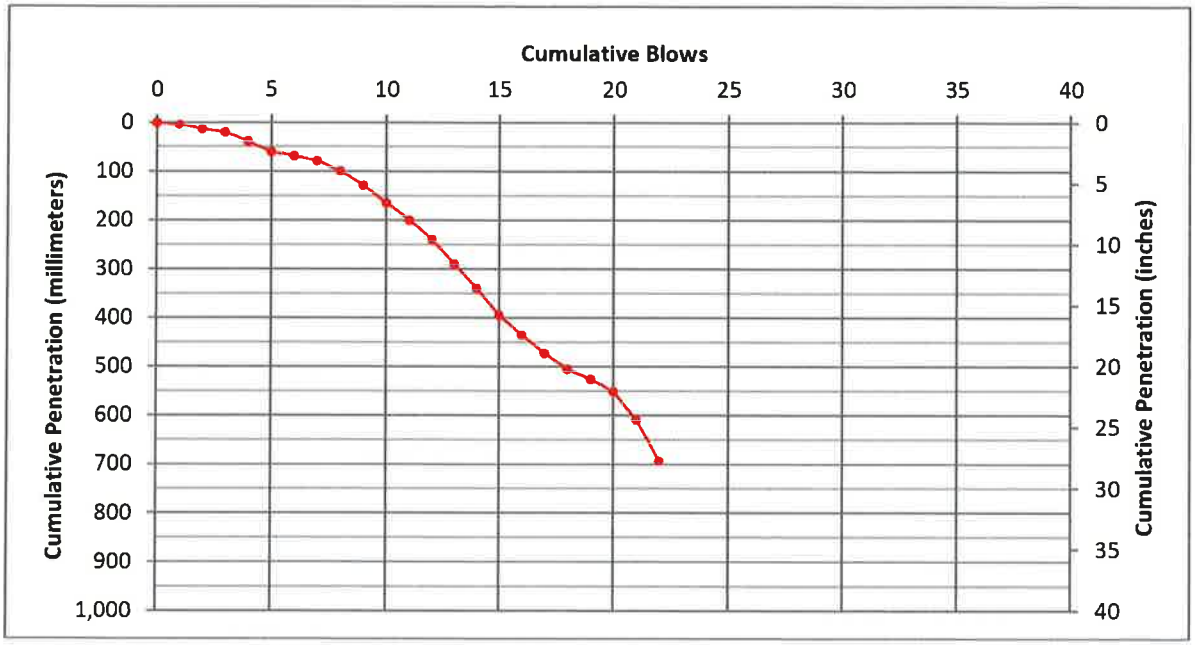
References:

ASTM D 6951, Standard Test Method for Use of the Dynamic Cone Penetrometer in Shallow Pavement Applications.

W.D. Powell, J.F. Foster, H.C. Mayhew, and M.E. Nunn, "The Structural Design of Bituminous Roads," TRRL Laboratory Report 1132, Transport and Road Research Laboratory, Department of Transport, United Kindgom, 1984.

DYNAMIC CONE PENETROMETER RESULTS - DCP 7

Layer	Soil Type	Hammer weight =	17.6 pounds
		Slope (mm/blow)	M_R (psi)
1	Soil not CL, CBR < 10 or not CH	22.5	10,400
2	---	---	---
3	---	---	---



$M_R = 96658 \times S^{-0.7168}$; soil not CL, CBR < 10 or not CH

$M_R = 469673 \times S^{-1.28}$; CL soil, CBR < 10

$M_R = 108206 \times S^{-0.64}$; CH soil

M_R = resilient modulus (pounds per square inch)

S = slope (millimeters per blow); multiplied by two (2) if 10-pound hammer is used

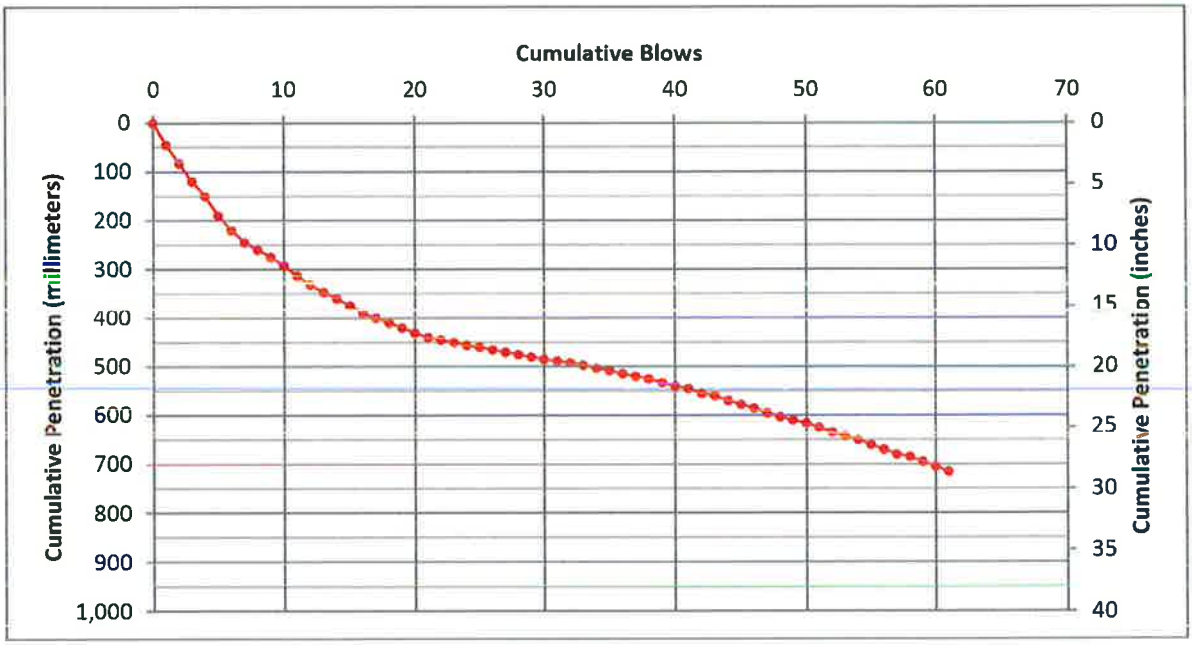
References:

ASTM D 6951, Standard Test Method for Use of the Dynamic Cone Penetrometer in Shallow Pavement Applications.

W.D. Powell, J.F. Foster, H.C. Mayhew, and M.E. Nunn, "The Structural Design of Bituminous Roads," TRRL Laboratory Report 1132, Transport and Road Research Laboratory, Department of Transport, United Kindgom, 1984.

DYNAMIC CONE PENETROMETER RESULTS - DCP 8

Layer	Soil Type	Hammer weight =	17.6 pounds
		Slope (mm/blow)	M_R (psi)
1	Soil not CL, CBR < 10 or not CH	28.1	8,800
2	---	---	---
3	---	---	---



$M_R = 96658 \times S^{-0.7168}$; soil not CL, CBR < 10 or not CH

$M_R = 469673 \times S^{-1.28}$; CL soil, CBR < 10

$M_R = 108206 \times S^{-0.64}$; CH soil

M_R – resilient modulus (pounds per square inch)

S = slope (millimeters per blow); multiplied by two (2) if 10-pound hammer is used

References:

ASTM D 6951, Standard Test Method for Use of the Dynamic Cone Penetrometer In Shallow Pavement Applications.

W.D. Powell, J.F. Foster, H.C. Mayhew, and M.E. Nunn, "The Structural Design of Bituminous Roads," TRRL Laboratory Report 1132, Transport and Road Research Laboratory, Department of Transport, United Kindgom, 1984.

APPENDIX C

APPENDIX C

DESIGN CALCULATIONS

This appendix presents our deign calculations for the use of Presto GeoSystems Geoweb for subgrade improvement.

AASHTO H20

CBR (%)	5
Cu (psi) from table 4.	21.7
Nc (low traffic, high rutting)	3.3
P (lb)	16000
p (psi)	100
r - see GW30V spec sheet	0.95
δ (deg)	26.6
Φ	28
Zt	1
Zb	7
H (in.)geoweb depth	6
D (in.)effective cell diam.	9.5

Variable Names

- c_u Subgrade shear strength
- N_c Bearing capacity coefficient - based on design traffic - see below
- P Design wheel load
- p Contact pressure
- r Geoweb cell wall/infill peak friction angle ratio
- δ Angle of shear resistance between the granular infill and Geoweb cell wall
- ϕ Angle of internal friction of the Geoweb infill material
- z_t Depth from surface to top of Geoweb cell walls
- z_b Depth from surface to bottom of Geoweb cell walls

Table 4 Correlation of Subgrade Soil Strength Parameters for Cohesive (Fine-Grained) Soils

California Bearing Ratio CBR (%)	Undrained Shear Strength c_u kPa (psi)	Standard Penetration Resistance SPT (blows/ft)	Field Identification
< 0.4	< 11.7 (1.7)	< 2	Very soft (extruded between fingers when squeezed)
0.4 - 0.8	11.7 - 24.1 (1.7) - (3.5)	2 - 4	Soft (molded by light finger pressure)
0.8 - 1.6	24.1 - 47.6 (3.5) - (6.9)	4 - 8	Medium (molded by strong finger pressure)
1.6 - 3.2	47.6 - 95.8 (6.9) - (13.9)	8 - 15	Stiff (readily indented by thumb but penetrated with great effort)
3.2 - 6.4	95.8 - 191 (13.9) - (27.7)	15 - 30	Very stiff (readily indented by thumbnail)
> 6.4	> 191 (27.7)	> 30	Hard (indented with difficulty by thumbnail)

N_c = 2.8 (High Traffic, Low Rutting - from U.S. Forest Service guidelines)
N_c = 3.3 Low Traffic, High Rutting - from U.S. Forest Service guidelines)

max allowable stress	qa (psi)	71.61	$q_a = N_c c_u$
radius of loaded area	R	7.1	where R = Radius of loaded area (i.e. effective radius of single or dual tires) $R = \sqrt{\frac{P}{p\pi}}$
vertical stress top of geoweb	σvt	99.7	$\sigma_{vt} = p\left[1-\left(\frac{1}{1+\left(\frac{R}{z_t}\right)^2}\right)^{3/2}\right]$
vertical stress bottom of geoweb	σvb	65.7	$\sigma_{vb} = p\left[1-\left(\frac{1}{1+\left(\frac{R}{z_b}\right)^2}\right)^{3/2}\right]$
Active earth pressure coefficient	Ka	0.4	
horizontal stress top of geoweb	σht	36.0	$\sigma_{ht} = K_a \sigma_{vt}$
horizontal stress bottom of geoweb	σhb	23.7	$\sigma_{hb} = K_a \sigma_{vb}$
average horizontal stress	σave	29.9	$\sigma_{avge} = \frac{(\sigma_{ht} + \sigma_{hb})}{2}$
stress reduction beneath loaded area	σr	18.9	$\sigma_r = 2\left(\frac{H}{D}\right)\sigma_{avge} \tan\delta$
Allowable Stress on Subgrade		71.61	
Stress on Subgrade		46.8	
Factor of Safety		1.5 acceptable	

Gulfstream 550

CBR (%)	5
Cu (psi) from table 4.	21.7
Nc (low traffic, high rutting)	3.3
P (lb)	30333
p (psi)	200
r - see GW30V spec sheet	0.95
δ (deg)	26.6
Φ	28
Zt	1
Zh	9
H (in.)geoweb depth	8
D (in.)effective cell diam.	9.5

Variable Names

c_u	Subgrade shear strength
N_c	Bearing capacity coefficient - based on design traffic - see below
$\bar{P}$	Design wheel load
p	Contact pressure
r	Geoweb cell wall/infill peak friction angle ratio
δ	Angle of shear resistance between the granular infill and Geoweb cell wall
ϕ	Angle of internal friction of the Geoweb infill material
z_t	Depth from surface to top of Geoweb cell walls
z_b	Depth from surface to bottom of Geoweb cell walls

Table 4 Correlation of Subgrade Soil Strength Parameters for Cohesive (Fine-Grained) Soils

California Bearing Ratio CBR (%)	Undrained Shear Strength c_u, kPa (psi)	Standard Penetration Resistance SPT (blows/ft)	Field Identification
< 0.4	< 11.7 (1.7)	< 2	Very soft (extruded between fingers when squeezed)
0.4 - 0.8	11.7 - 24.1 (1.7) - (3.5)	2 - 4	Soft (molded by light finger pressure)
0.8 - 1.6	24.1 - 47.8 (3.5) - (6.9)	4 - 8	Medium (molded by strong finger pressure)
1.6 - 3.2	47.8 - 95.8 (6.9) - (13.9)	8 - 15	Stiff (readily indented by thumb but penetrated with great effort)
3.2 - 6.4	95.8 - 191 (13.9) - (27.7)	15 - 30	Very stiff (readily indented by thumbnail)
> 6.4	> 191 (27.7)	> 30	Hard (indented with difficulty by thumbnail)

N_c = 2.8 (High Traffic, Low Rutting - from U.S. Forest Service guidelines)
N_c = 3.3 Low Traffic, High Rutting - from U.S. Forest Service guidelines)

max allowable stress	qa (psi)	71.61
radius of loaded area	R	6.9
vertical stress top of geoweb	σvt	199.4
vertical stress bottom of geoweb	σvb	100.8
Active earth pressure coefficient	Ka	0.4
horizontal stress top of geoweb	σht	72.0
horizontal stress bottom of geoweb	σhb	36.4
average horizontal stress	σave	54.2
stress reduction beneath loaded area	σr	45.7
Allowable Stress on Subgrade		71.61
Stress on Subgrade		55.1
Factor of Safety		1.30 acceptable

$q_a = N_c c_u$

where R = Radius of loaded area (i.e. effective radius of single or dual tires) $R = \sqrt{\frac{P}{\pi p}}$

$$\sigma_{vt} = p\left[1 - \left(\frac{1}{1+\left(\frac{R}{z_t}\right)^2}\right)^{3/2}\right] \qquad \sigma_{vb} = p\left[1 - \left(\frac{1}{1+\left(\frac{R}{z_b}\right)^2}\right)^{3/2}\right]$$

$\sigma_{ht} = K_a \sigma_{vt}$
$\sigma_{hb} = K_a \sigma_{vb}$
$\sigma_{avge} = \frac{(\sigma_{ht} + \sigma_{hb})}{2}$

$\sigma_r = 2\left(\frac{H}{D}\right)\sigma_{avge} \tan\delta$

Equivalent Single Wheel Loading (ESWL) GV-GER-1212

1. Introduction:

One consideration in operating Gulfstream aircraft is the strength of runway and taxiway pavements in relation to aircraft operating weight. This can limit operational weights in some airports. One common method of evaluating an aircraft for a given runway is the Equivalent Single Wheel Loading (ESWL). ESWL accounts for the extra tire flotation for multi-wheel landing gear struts such as the dual wheel struts used on the Gulfstream aircraft. This section provides information on how to compute ESWL for the G550 and G500 airplanes.

2. G550 and G500 Main Landing Gear Parameters:

Max Ramp Weight (pounds)	MLG Tire Size (inches)	Tire Spacing (inches)	Max Tire Pressure (psi)	Reduction Factor -	Maximum ESWL (pounds)
91,400	35 X 11.0	18.5	198	1.25	32,904

The reduction factor in the table above assumes a rigid pavement with a radius of equivalent stiffness of 40 inches, roughly equivalent to a 13.5 inch thick concrete slab. Thinner pavements would give higher reduction factors, so the factors presented are conservative.

3. ESWL Computation for Lower Operating Weights:

ESWL can be computed for lower operating weights as follows:
ESWL = (Gross Weight) x (0.9) x (0.5) / (Reduction Factor)

Aircraft	Gulfstream G550	
Gross Weight (lb)	91000	
Reduction Factor	1.35	assume 1.35, since rutting is allowed
ESWL (lb)	30333.33	
tire presure (psi)	200	

PRESTO | GEOSYSTEMS
STRENGTH FROM THE GROUND UP
Since 1979

Product Specification - GEOWEB® GW30V Geocells

GENERAL

GEOWEB® product is manufactured from textured, perforated strips of high density polyethylene that are bonded together to create a network of interconnected cells. The GEOWEB® cells can be filled with soil, aggregate, concrete, pulverized debris, recycled asphalt pavement, or other infill material for geotechnical applications such as: 1) load support for unpaved and paved roads, railways, ports, heavy-duty pavements, container yard, and basal embankments stabilization; 2) retaining structures, free-standing structures, and fascia walls; and, 3) slope, channel, and geomembrane protection.

DIMENSIONS

Parameter	Units	Value
Cell Depth (Available in 5 Depths)[1]	inches (mm)	3 (75), 4 (100), 6 (150), 8 (200), 12 (300)
Cell Size (Length x Width +/- 10%)	inches (mm)	11.3 x 12.6 (287 x 320)
Expanded Section Width	No. Cells	8
	Feet (m)	Varies: 7.7 to 9.2 (2.3 to 2.8)
Expanded Section Length	No. Cells	18, 21, 25, 29, or 34
	Feet (m)	Varies: 15.4 to 35.1 (4.7 to 10.7)

STRUCTURAL INTEGRITY AND SYSTEM PERFORMANCE

Parameter	Units	Value
Minimum Short Term Seam Peel Strength	lbf/in (N/cm)	≥80 (142)
Long-Term Seam Peel Strength (standard 4-inch sample width)[2]	lb (N)	160 (710)
Internal Junction Efficiency[3]	%	≥100
Mechanical Junction Efficiency (Connection Type: ATRA Key)[3]	%	≥100
Peak Friction Angle Ratio (δ/Φ)[4]	Unitless	0.95

MATERIAL PROPERTIES

Parameter	Test Method	Units	Value
Polymer Density	ASTM D1505 or D792	g/cm³	0.935 - 0.965
Carbon Black Content[5]	ASTM D1603	%	1.5 - 2.0
Sheet Thickness Prior to Texture	ASTM D5199	mm (mil)	1.27 (50), -5% +10%
Sheet Thickness After Texture	ASTM D5199	mm (mil)	1.52 (60), -5% +10%
Texture Type/Shape	—	—	Rhomboidal
Texture Density	—	indentations/cm²	22 - 31

DURABILITY

Parameter	Test Method	Units	Value
Environmental Stress Crack Resistance	ASTM D1693	hrs	>5,000
Resistance to Oxidation[6]	EN ISO 13438	yrs	≥50
Resistance to Weathering[7]	EN 12224	%	100

Notes:

1) 12-inch cell depth available in 21-cell panel length only.

2) A 100 mm (4.0 in.) wide seam sample shall support a 72.5 kg (160 lb) load for a period of 7 days minimum in a temperature-controlled environment undergoing a temperature change on a 10 hour cycle from ambient room to 54° C (130° F). Ambient room temperature is per ASTM E 41.

3) Junction efficiency determined as a percentage of junction performance (EN ISO 13426-1) to reinforced strip performance (EN ISO 10319).

4) Typical design value for clean granular infill material (i.e. - coarse sand or crushed aggregate). Consult with manufacturer to confirm value for other types of infill materials.

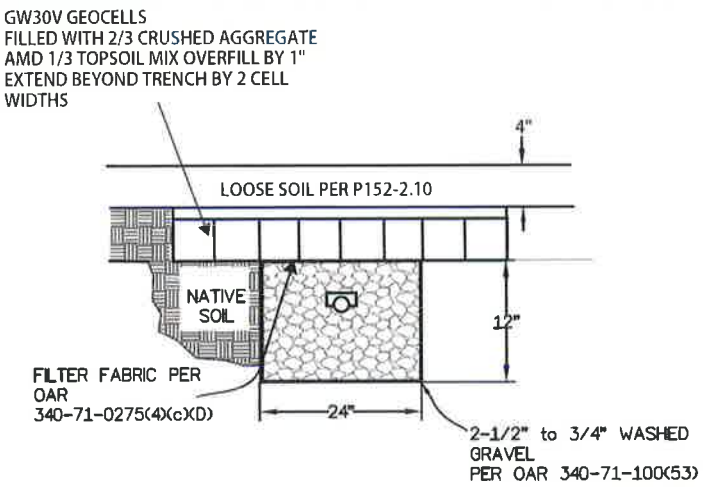
5) Standard black HDPE strips. For tan/green GEOWEB, hindered amine light stabilizer (HALS) content will be 2.0% by weight of carrier.

6) Predicted to be durable for a minimum of 50 years in natural soils with a pH between 4 and 9 and at a soil temperature ≤ 25°C.

7) 100% of original tensile strength retained following exposure to intense UV radiation and accelerated weathering in accordance with EN 12224.

ISO 9001:2015 Certified

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TYPICAL DETAIL (NOT TO SCALE)

NV5

Delivering Solutions
Improving Lives

BEFORE THE BOARD OF COMMISSIONERS
FOR MARION COUNTY, OREGON

In the Matter of the	)	Case No. CP 03-4
	)	
Application of:	)	Clerk's File No. 4968
	)	
RICHARD VAN GRUNSVEN	)	COMPREHENSIVE
OF HD AVIATION, TED MILLAR	)	PLAN AMENDMENT
OF SOUTH END AVIATION,	)	
AND JACK HOGAN	)	AN ADMINISTRATIVE ORDINANCE

ORDINANCE NO. 1205

THE MARION COUNTY BOARD OF COMMISSIONERS HEREBY ORDAINS AS FOLLOWS:

SECTION I. **Purpose**

This Ordinance is enacted pursuant to the authority granted to general law counties in the State of Oregon by ORS Chapters 197, 203, and 215 to implement the Marion County Comprehensive Land Use Plan. This ordinance amends the Marion County Comprehensive Plan by taking exceptions to Statewide Land Use Planning Goals 11—Public Facilities and Services and 14—Urbanization for certain properties to share a septic system at the Aurora State Airport. (T4S; R1W; Section 11A; Tax lots 200, 201, 203, and 400) and (T4S; R1W; Section 02D; Tax lots 1100 and 1600).

SECTION II. **Procedural History**

The Marion County Board of Commissioners held a public hearing on September 22, 2004, for which proper public notice and advertisement was given. The purpose of the hearing was to consider proposed amendments to the Marion County Comprehensive Plan to take exceptions to Statewide Land Use Planning Goals 11—Public Facilities and Services and 14—Urbanization for certain properties to share a septic system at the Aurora State Airport. All persons present during the public hearing were given the opportunity to speak or present written statements.

SECTION III. **Adoption of Findings and Conclusion**

The Board has reviewed the evidence and testimony in the record. The amendments to the Marion County Comprehensive Plan made hereunder are based on consideration and analysis of existing Marion County Comprehensive plan goals and policies and zoning regulations and the provision of ORS Chapters 197 and 215, Oregon Administrative Rules 660 Divisions 4, 11, 14, 8, and 33, and the State Land Use Planning Goals.

After careful consideration of all facts and evidence in the record, the Board adopts as its own the Facts and Findings contained in Exhibit A, attached hereto, and by this reference incorporated herein. The properties which are granted goal exceptions are shown on the map attached as Exhibit B, attached hereto, and by this reference incorporated herein.

SECTION IV. Action

The exceptions to Goals 11 and 14 to permit six parcels at the Aurora Airport to share an existing septic disposal system are **GRANTED**.

SECTION VI. Severability

Should any section, subsection, paragraph, sentence, clause, or phrase of this Ordinance or any policy, provision, findings, statement, conclusion, or designation to a particular land use or area of land, or any other portion, segment or element of this Ordinance or of any amendments thereto and adopted hereunder, be declared invalid for any reason, such declaration shall not affect the validity and continued application of any other portion or element of this Ordinance or amendments to the Comprehensive Plan; and if this Ordinance or any portion thereof should be held to be invalid on one ground, but valid on another, it shall be construed that the valid ground is the one upon which this Ordinance of any portion thereof was enacted.

SECTION VII. Effective Date

Pursuant to Ordinance 669, this is an administrative Ordinance and shall take effect 21 days after the adoption and signatures of the Marion County Board of Commissioners.

SIGNED and FINALIZED this 13 day of October, 2004 at Salem, Oregon.

MARION COUNTY BOARD OF COMMISSIONERS

Janet Carlson
Chair

Jan Eastwood
Recording Secretary

JUDICIAL NOTICE

Oregon Revised Statutes (ORS) Chapter 197.830 provides that land use decisions may be reviewed by the Land Use Board of Appeals (LUBA) by filing a notice of intent to appeal within 21 days from the date this ordinance becomes final.

Exhibit A

Facts and Findings:
Exceptions to Goals 11 and 14

BACKGROUND:

In 1999, the applicants received approval from the Oregon Department of Environmental Quality (DEQ) to construct a recirculating gravel filter septic disposal system which was intended to serve six parcels at the southern end of the Aurora. After constructing the system, the applicants were informed by DEQ that Goal 11 forbids the extension of septic lines across property lines and an exception to Goal 11 would have to be taken in order to connect and operate the system.

In June 2003, the applicants applied for a comprehensive plan change to take an exception to Goal 11 to permit shared septic facilities. Staff from the Department of Land Conservation and Development commented that the Goal 11 exception would have to be accompanied with either an exception to Goal 14, because the Public zone at that time did not comply with Goal 14 requirements, or amendments to the Public zone that would bring it into compliance with Goal 14 requirements for rural uses outside of rural communities.

The county was involved in a periodic review task to amend the rural zoning ordinance to comply with Goal 14 and the applicants agreed to place their application on hold until the Goal 14 issues were resolved regarding the Public zone. On July 28, 2004, the Marion County Board of Commissioners adopted amendments to the Marion County Rural Zoning Ordinance which brought the code into compliance with Goal 14 requirements. Subsequently, this application was taken off hold and the applicants requested that the Board call-up the request and hold the first evidentiary hearing. Notice of public hearing was mailed on September 1, 2004 to property owners within 500 feet of the subject parcels. Notice was also published in the Statesman-Journal.

On September 22, 2004, the Board held a public hearing to consider amendments to the Marion County Comprehensive Plan taking exceptions to Goals 11 and 14 for an existing shared septic system for six parcels at the southern end of the Aurora Airport. The Board closed the hearing and directed staff to prepare an ordinance taking those exceptions.

FACTS:

1. The subject properties are designated Public in the Marion County Comprehensive Plan and are correspondingly zoned P (PUBLIC) under the Marion County Rural Zoning Ordinance (MCRZO). The purpose of the Public designation and zone is to provide regulations governing the development of land appropriate for specific public and semi-public uses.

2. The properties are located on the north side of Keil Road NE, approximately 1,700 feet west of the intersection of Airport Road NE and Keil Road. The parcels contain aircraft related facilities and are proposed for additional development in the future.

3. Adjacent properties to the southwest, west, east, and north are zoned P and contain the Aurora Airport and airport related uses and businesses. Properties to the south are zoned EFU (EXCLUSIVE FARM USE) and are devoted to farm use.

4. The airport facility was constructed at this site in 1943 to provide an emergency alternate field for carrier aircraft. It has been in operation as an airport, and zoned public, since that time. Since before 1968, additional land east of the runway and north of Keil Road has also been zoned public and closely associated with the airport. Between 1968 and 1981, properties to the south of Arndt Road and east of the runway were rezoned to public and developed with airport uses. In 1981, the airport facility, and surrounding airport related uses in the public zone, were acknowledged as exceptions in the Marion County Comprehensive Plan.

5. The 1976 Airport Master Plan was adopted by Marion County as part of its comprehensive plan. The adoption included a committed exception area to Statewide Planning Goal 3 of approximately 250 acres at the Aurora State Airport. In 1994, an exception for an additional 1.86 acres was taken and acknowledged to add land to the southwest of the airport. The County's Airport Overlay Zone, Marion County Rural Zoning Ordinance (MCRZO) Chapter 177 has been applied to both the 1981 exception area and the area added in 1994.

6. In Legislative Amendment 03-3, which amended the Marion County Rural Zoning Ordinance to comply with Goal 14 requirements for rural exception areas, an exception to Goal 14 for size of use was approved for airport related uses at the Aurora State Airport due to its being developed with a use that is urban in nature and requiring urban styled development to support the existing uses.

COMMENTS:

7. Marion County Building Inspection commented that based on the information submitted in the attached site plan, Building Inspection cannot make a determination on the permit requirements.

8. The FAA commented, "on-airport development requires submittal to FAA of FAA Form 7460-1, off-airport development requires submittal of separate form 7860-1, concurrence of Oregon Dept. of Aviation required for on-airport development, recommended for off-airport development."

9. All other contacted agencies stated that they had no objections or had not commented at the time the staff report was prepared. All comprehensive plan changes are subject to review by the State Department of Land Conservation and Development (DLCD).

DLCD's comments are contained in the file and explained in the background section of this report.

ANALYSIS:

10. Goal 11—Public Facilities and Services states: "Local Governments shall not allow the establishment or extension of sewer systems outside urban growth boundaries or unincorporated community boundaries...." The Goal defines "extension of a sewer or water system" as "the extension of a pipe, conduit, pipeline, main, or other physical component from or to an existing sewer or water system in order to provide service to a use that was not served by the system on the applicable date of this rule...."

    Goal 14—Urbanization prohibits the establishment of urban services on rural lands and the shared septic facility constitutes a urban level of service as defined by Goal 11. Because of this, an exception to Goal 14 will have to be taken along with an exception to Goal 11.

11. The exception requirements for land physically developed to uses other than those allowed by the applicable goal is set forth in OAR 660-004-0025:

    (1) A local government may adopt an exception to a goal when the land subject to the exception is physically developed to the extent that it is no longer available for uses allowed by the applicable goal.

    (2) Whether land has been physically developed with uses not allowed by an applicable Goal will depend on the situation at the site of the exception. The exact nature and extent of the areas found to be physically developed shall be clearly set forth in the justification for the exception. The specific area(s) must be shown on a map or otherwise described and keyed to the appropriate findings of fact. The findings of fact shall identify the extent and location of the existing physical development on the land and can include information on structures, roads, sewer and water facilities, and utility facilities. Uses allowed by the applicable goal(s) to which an exception is being taken shall not be used to justify a physically developed exception.

12. It was determined previously in Legislative Amendment Case No. 03-3 that the existing airport-related development at the airport exceeds the size limitations for commercial and industrial uses allowed by Goal 14 and the Unincorporated Communities Rule and an exception was talen to permit continued development to occur at a level consistent with existing development at the airport. The Land Use Board of Appeals (LUBA) recognized that the level of development at the airport would likely require exceptions to Goals 11 and 14, referring to the Aurora State Airport as an "urban public facility" and commenting that the text of an exception "probably could be very similar to that required for the proposed exception to Goal 3," an exception which was subsequently acknowledged by LCDC. Murray et al. v. Marion County, 23 Or LUBA 268 (1992).

13. OAR 660-014-0040 sets forth the criteria for taking an exception to Goal 11—Public Facilities and Goal 14—Urbanization:

(1) As used in this rule, "undeveloped rural land" includes all land outside of acknowledged urban growth boundaries except for rural areas committed to urban development. This definition includes all resource and nonresource lands outside of urban growth boundaries. It also includes those lands subject to built and committed exceptions to Goals 3 or 4, but *not* developed at urban density or committed to urban level development.

(2) A county can justify an exception to Goal 14 to allow incorporation of a new city or establishment of new urban development on undeveloped rural land. Reasons which can justify why the policies in Goals 3, 4, 11, and 14 should not apply can include but are not limited to findings that an urban population and urban levels of facilities and services are necessary to support an economic activity which is dependent upon an adjacent or nearby natural resource.

(3) To approve an exception under this rule, a county must also show:

(a) That Goal 2, Part II(c)(1) and (c)(2) are met by showing the proposed urban development cannot be reasonably accommodated in or through expansion of existing urban growth boundaries or by intensification of development at existing rural centers;

(b) That Goal 2, Part II(c)(3) is met by showing the long-term environmental, economic, social and energy consequences resulting from urban development at the proposed site with measures designed to reduce adverse impacts are not significantly more adverse than would typically result from the same proposal being located on other undeveloped rural lands, considering:

(A) Whether the amount of land included within the boundaries of the proposed urban development is appropriate, and

(B) Whether urban development is limited by the air, water, energy and land resources at or available to the proposed site, and whether urban development at the proposed site will adversely affect the air, water, energy and land resources of the surrounding area.

(c) That Goal 2, Part II(c)(4) is met by showing the proposed urban uses are compatible with adjacent uses or will be so rendered through measures designed to reduce adverse impacts considering:

(A) Whether urban development at the proposed site detracts from the ability of existing cities and service districts to provide services; and

(B) Whether the potential for continued resource management of land at present levels surrounding and nearby the site proposed for urban development is assured.

(d) That an appropriate level of public facilities and services are likely to be provided in a timely and efficient manner;

(e) That incorporation of a new city or establishment or new urban development of undeveloped rural land is coordinated with comprehensive plans of affected jurisdictions and consistent with plans that control the area proposed for incorporation.

14. The Aurora Airport has been in place since 1943 and airport related uses have been associated with the airport since before 1968. The airport consists of properties in multiple ownerships providing a wide range of aviation-related and support services such as aircraft instruction, rental, maintenance, charter, sales, avionics sale and repair, aircraft construction, storage, fueling, helicopter maintenance and fueling, aerial photography, and others. This airport provides necessary air transportation services to businesses and individuals in Marion, Clackamas, Washington and Multnomah counties, enhancing the economy of the region and the state. The airport facility depends on its location, and the commercial, industrial and population centers and growth in the area, for its viability and necessity. This state airport facility is uniquely able to provide services to the surrounding rural area and nearby communities, as well as a connection to other urban airports because of it's proximity to the Interstate 5 corridor and Highway 99E, the county roadway system, Clackamas County and the south Metro area. In addition, the need for airport transportation facilities is recognized in the Marion County Comprehensive Plan (MCCP).

The Aurora State Airport is needed to serve the economic and air transportation needs of the surrounding community which is dependent upon the existing location of the airport. The criteria in 13(1) and 13(2) are met.

15. The nearest UGB is that of the City of Aurora, approximately 1500 feet to the southeast of the airport. The land between the existing UGB and the airport boundary is resource land. The City of Aurora originally proposed that the airport be included in the UGB when it was going through acknowledgement; however, this was not approved by LCDC and the UGB was reduced to the present area. It continues to be unreasonable to extend the UGB this distance due to the amount of intervening resource land at this time. There are also no rural centers which could encompass the proposed exception area. The closest rural center, Fargo Interchange, is over 9,000 feet west of the airport. The criterion in 13(3)(a) is met.

16. The criteria in 13(3)(b) require that the long-term environmental, economic, social and energy consequences resulting from urban development at the proposed site not be significantly more adverse than would result from the same proposal being located on

other undeveloped rural lands. Because the Aurora Airport is already developed with airport and airport-related uses, and because of its demonstrated need to be located where it currently is, as explained in #14, there are no alternative locations being considered requiring the use of undeveloped land.

Additionally, information provided by the applicant demonstrates that developing the properties with septic or holding tanks would be much more expensive than using a shared septic system.

Also there are environmental concerns developing with septic systems on the subject properties. The soils on the subject properties are not optimum soils for septic systems and can be difficult to locate a system on an individual property. A shared septic also provides the opportunity to process the effluent in a more complete manner that can be certified to meet Leadership in Energy and Environmental Design (LEED) standards.

Considering the lack of alternatives locations for the airport, as well as the benefits economically and environmentally and the potential for positive affects on the air, water, energy and land resources of properties and surrounding area, the criteria in 13(3)(a) and (b) are met.

17. Public facilities are not provided by any of the surrounding cities or service districts. The airport has existed surrounded by resource land and uses since 1943. During that time there has been no evidence that the airport has reduced the potential for continued resource management of land surrounding the airport. Aside from a runway extension, no expansion of airport facilities has occurred historically and no expansion of facilities is proposed in the airport master plan. There is no evidence that a shared septic system for the subject properties will adversely impact surrounding property uses. The criterion in 13(3)(c) is met.

18. The airport has established an Aurora Airport Water Control District to provide a fire suppression water system. Development on the subject properties would still be limited to the capacity of systems in place, including holding tanks, which would serve the uses. Although the City of Aurora sewer system became operational in 2001, there are no plans to extend the system to the airport, at this time, nor has any determination been made of the capacity of the city system to serve the airport. The criterion in 13(3)(d) is met.

19. No incorporation of a new city or establishment is proposed. Any new urban development of undeveloped rural land will be coordinated with the comprehensive plans of affected jurisdictions and applicable zoning. The criterion in 13(3)(e) is met.

20. OAR 660-004-0018 states that for "physically developed" and "irrevocably committed" exceptions to goals, plan, and zone designations shall authorize a single numeric minimum lot size and shall limit uses, density, and public facilities and services to those:

    (a) Which are the same as the existing land uses on the exception site; or

(b) Which meet the following requirements:

(A) The rural uses, density, and public facilities and services will maintain the land as "Rural Land" as defined by the goals and are consistent with all other applicable Goal requirements; and

(B) The rural uses, density, and public facilities and services will not commit adjacent or nearby resource land to nonresource use as defined in OAR 660-004-0028; and

(c) The rural uses, density, and public facilities and services are compatible with adjacent or nearby resource uses.

21. The proposal does not change the allowable commercial or industrial uses at the airport. The purpose of the exception is to allow a shared septic system to serve six parcels at the airport, consistent with the existing urban level of development already existing at the airport. There is no evidence that an exception to permit a shared septic will not commit adjacent or nearby resource land to nonresource use as defined in OAR 660-004-0028. The proposal satisfies the criterion in 20(a) and (b).

22. The airport has a history of being compatible with adjacent and nearby resources uses since its inception over sixty years ago. There is no evidence that allowing the subject properties to share a septic system will be incompatible with surrounding resource uses. The shared septic will be located on the properties where the septic is shared and will not commit surrounding land to nonresource uses. The surrounding resource uses have also been compatible with airport uses. The master planning process, which the Oregon Department of Aviation recently completed for the airport in 2000, requires consideration of National Environmental Protection Act (NEPA) requirements as well as compatibility with surrounding uses. The proposal satisfies the criterion in 20(c).

23. In addition to providing procedures, the MCCP provides guidelines and policies to ensure compatibility with the adopted comprehensive plan and consistency in the planning process. The first guideline is that the proposal should comply with the Statewide Planning Goals that apply in a particular situation. This proposal must be consistent with all applicable Statewide Planning Goals except Goals 3, 11 and 14 for which exceptions have been taken.

24. The proposal is consistent with Statewide Planning Goal 1—Citizen Involvement, which provides for citizen involvement in the planning process. Notice was sent of the request for goal exceptions. A public hearing will were be held before the Board of Commissioners where concerned citizens will have the opportunity to provide comment and make suggestions.

The application is consistent with Goal 2—Land Use Planning since the proposal is consistent with the County's acknowledged comprehensive plan. Moreover, appropriate analysis of the exception provisions have been provided with regard to Goals 11 and 14.

Goals 3—Agricultural Lands, 4—Forest Lands and 5—Open Spaces, Scenic and Historic Areas, and Natural Resources are not applicable to this proposal.

Because the airport and related uses already exist, and the proposal seeks to maintain development at the existing level of uses and sizes, there is no evidence that the proposal will impact air, water or land resource quality over any impacts of the existing airport. Development within the public zone is subject to standards that address and seek to minimize adverse impacts to surrounding uses and resources. The proposal is consistent with Goal 6—Air, Water and Land Resources Quality.

The airport is not in an area subject to natural disasters; the proposal is consistent with Goal 7—Areas Subject to Natural Disasters and Hazards.

Goal 8—Recreational Needs is not applicable to this proposal.

The proposal is consistent with Goal 9—Economic Development. The subject properties are needed to serve commercial, industrial, and public uses in the surrounding community. Allowing development to continue at sizes commensurate with existing development will sustain the economic viability of the airport. The airport and associated uses provide employment to the area and in the state. Employment at the airport should also increase as use of the airport continues to increase as described in the Aurora State Airport Master Plan.

Goal 10—Housing is not applicable to this proposal.

The proposal is consistent with Goal 12—Transportation because the airport is necessary to serve the aviation needs of users at the airport and the surrounding communities. The location of this airport has also been demonstrated to be necessary because neighboring cities and communities do not provide public airport facilities. In addition, the airport is either bordered by or in close proximity to major road facilities, the Interstate 5 corridor, Hubbard Cutoff Road, Highway 99E, Arndt Road, Keil Road, and Airport Road, which provide the traveling public access to and from the airport for both persons and freight.

Goals 13—Energy Conservation, 15—Willamette River Greenway, 16—Estuarine Resources, 17—Coastal Shorelands, 18—Beaches and Dunes and 19—Ocean Resources do not apply to this proposal.

Overall, the proposal is in compliance with the Statewide Planning Goals or an appropriate exception has been taken.

25. The proposal must also conform to the relevant policies in the comprehensive plan. In discussing this requirement, only relevant comprehensive plan policies will be mentioned.

Rural Services Policy #1: The impact on existing services and the potential for additional facilities should be evaluated when rural development is proposed.

Rural Services Policy #2: It is the intent of Marion County to maintain the rural character of areas outside of urban growth boundaries by allowing those uses that do not increase the potential for urban services.

Rural Services Policy #3: Only facilities and services that are necessary to accommodate planned rural land uses should be provided unless it can be shown that the proposed service will not encourage development inconsistent with maintaining the rural density and character of the area.

Rural Services Policy #4: The sizing of public or private service facilities shall be based on maintaining the rural character of the area. Systems that cannot be cost effective without exceeding the rural densities specified in this Plan shall not be approved. The County shall coordinate with private utilities to ensure that rural development can be serviced efficiently.

Any new development on the subject properties will be airport-related and similar to, and no more intensive than, existing development. There is no evidence that the existence of the airport since 1943 has increased the need for urban services or that the development at the airport has impacted the density or character of the rural area. The shared septic facility reflects the urban nature of uses at the airport while not committing the parcels to a fully urban level of development. The parcels would still be able to be developed with urban facilities once those became available. The proposal complies with the rural development policies.

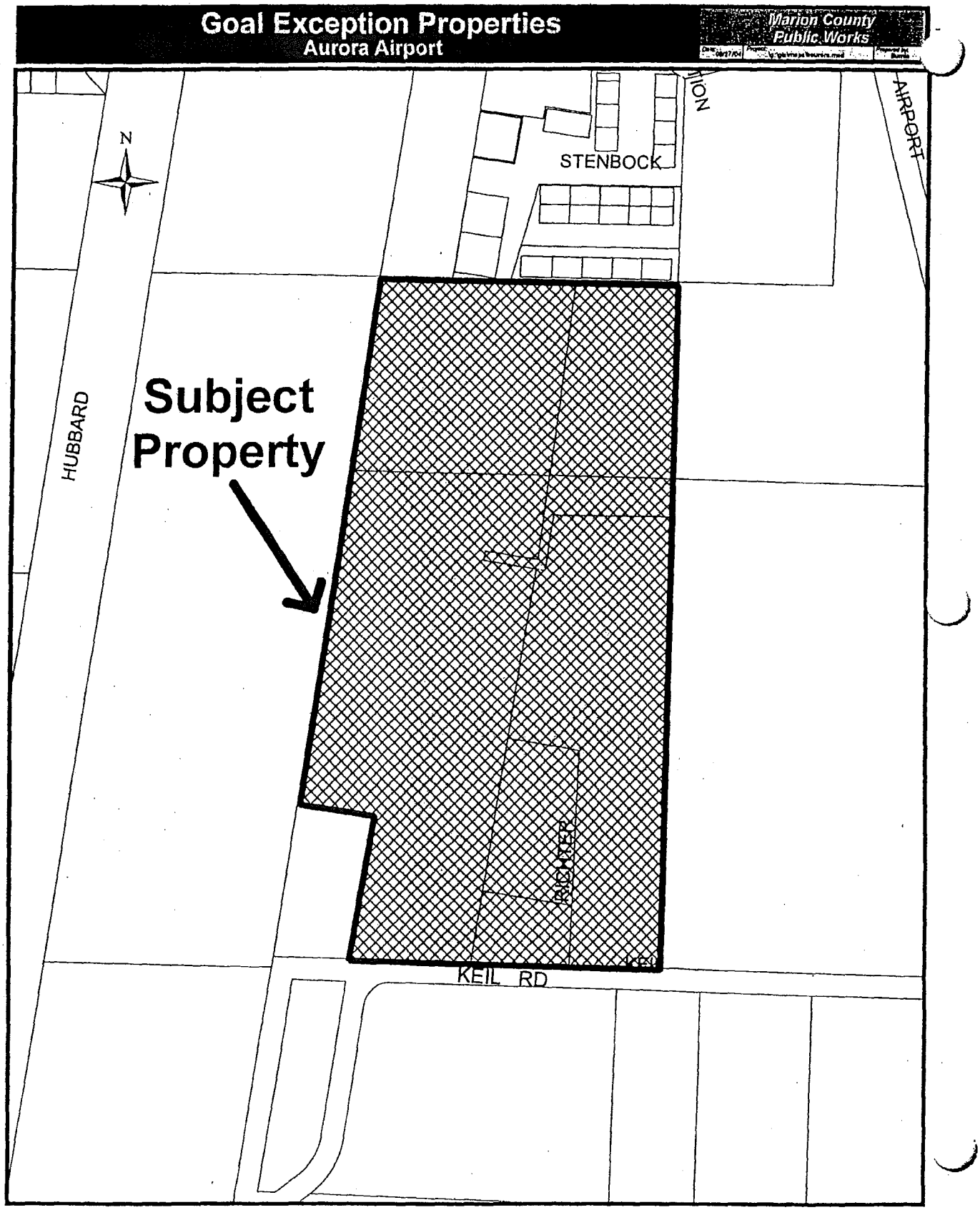
Transportation Policy #8: Airports and airstrips shall be located in areas that are safe for air operations and compatible with surrounding uses.

The existing location of the airport has demonstrated it is in a safe location for air operations. There have been concerns from neighboring residential areas regarding noise at the airport. Efforts have been made over the years to reduce the level of noise associated with airport operations. This proposal will not have an impact on airport operations and, so, will not affect the level of noise produced at the airport. The fact that many of the surrounding lands are in resource zones helps to mitigate the impact of noise from the airport on those lands and surrounding urbanized uses. The proposal complies with applicable transportation policies.

CONCLUSION:

The Board finds that the proposed exceptions meet the applicable criteria in the Oregon Administrative Rules, Oregon Revised Statutes, Statewide Planning Goals, and the Marion County Comprehensive Plan that physically developed and reasons exceptions to Goals 11 and 14 are justified for the subject properties to be able to share a septic system at the Aurora State Airport.

Exhibit B


Goal Exception Properties
Aurora Airport
Marion County
Public Works
N
STENBOCK
AIRPORT
HUBBARD
Subject
Property
KEIL RD

KNOW Before You Go

KNOW BEFORE YOU GO

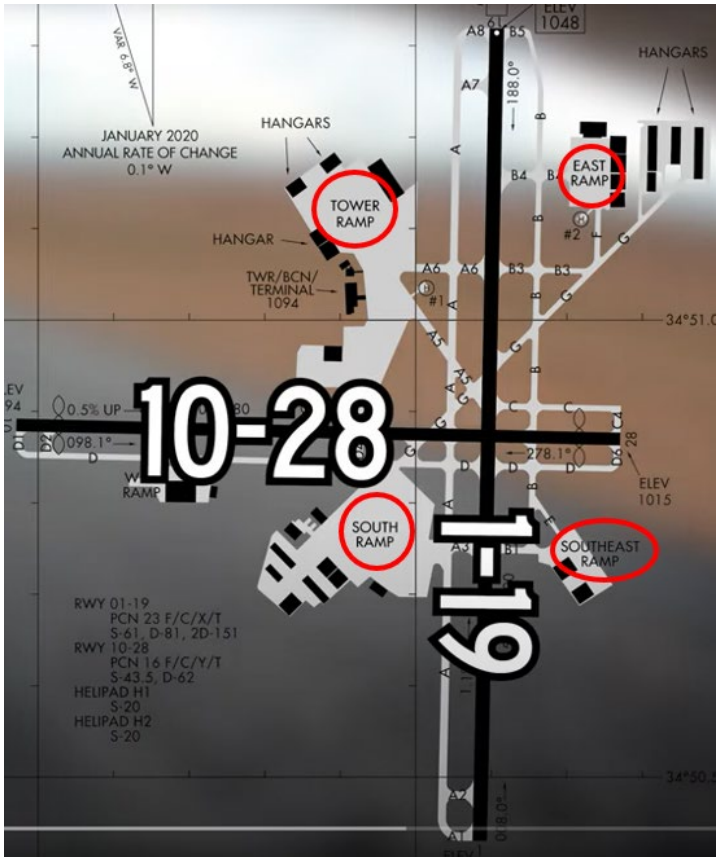
This information is subject to change. Not for navigation or legal pre-flight action.

View the FAA's From the Flight Deck video to see actual KGMU airport runway approach and taxiway footage combined with diagrams and visual graphics to clearly identify hot spots and other safety-sensitive items.

Greenville Downtown Airport (KGMU) is a medium-sized general aviation airport located on the eastern edge of the city of Greenville, South Carolina. It primarily serves the general and business aviation community, air taxi traffic and a local Medivac network. This, combined with seven flight schools located on the airport, makes for a wide range of pilot experience and aircraft performance.

The airport is six miles southwest of the larger Greenville Spartanburg International Airport (KGSP) and five miles north of the Donaldson Field Airport (KGYH). Pilots have confused these airports primarily when operations are in a north configuration.

The airport configuration consists of two intersecting runways designated RWY 1/19 and RWY 10/28.
A complex taxiway system provides access to all businesses on the field, including the FBO and ramp areas which are in all four quadrants of the airport. There is a high number of vehicular traffic, including slower aircraft under tow and golf carts.



KGMU Tower
Hours of Operation – 0700L-2200L
Administrative Office
Open 0700L to 1500L - M through F
Business Phone 864-271-2033

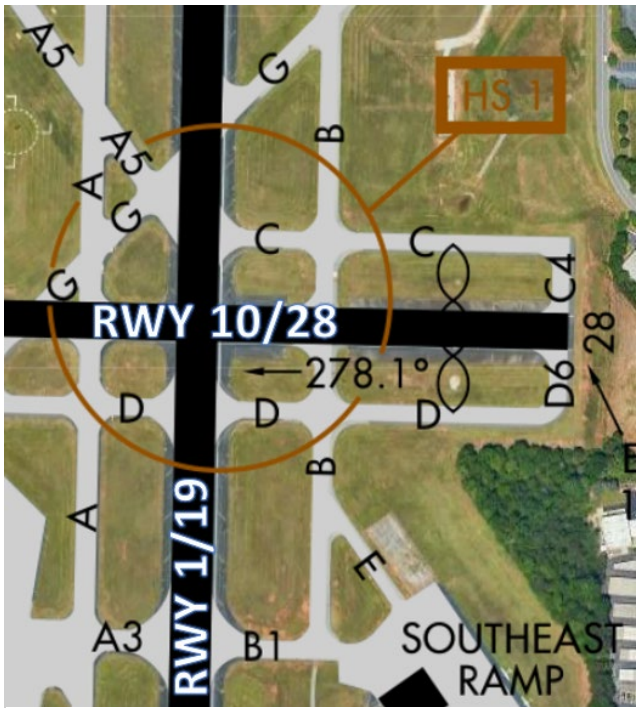
The **airspace** at KGMU is **Class D** and underlies Greer Class C airspace. (Refer to Sectional Chart.)

Cautions

Hot Spots

HS 1 Maintain vigilance complex RWY and TWY Intersection.

- ✓ Multiple TWYs converge at this Hot Spot and a RWY intersection adds to the complexity.
- ✓ It is necessary that the pilot follows controller instructions.
- ✓ Maintain outside vigilance and utilize the TWY and RWY signs and markings to adhere to your clearance.
- ✓ There have been several RWY incursions at this intersection.
- ✓ Always ask the controller if you are in doubt.



Hot Spot 1

Wrong Surface TWY Landing

- ✓ The risk of landing on a TWY exists at airports with TWYs that parallel the adjoining RWY.



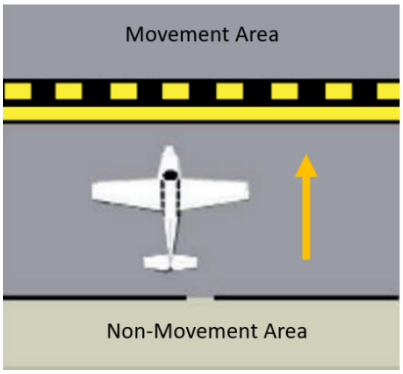
Landing

- ✓ RWY 10/28 thresholds are displaced.
- ✓ When exiting the RWY, do not **stop short** or **not completely** across the Hold Short Line. You are not clear of the RWY until every part of your aircraft is across the Hold Short Line. Not clearing the RWY may cause following aircraft to go-around.

Surface Risk – Movement Area Cautions

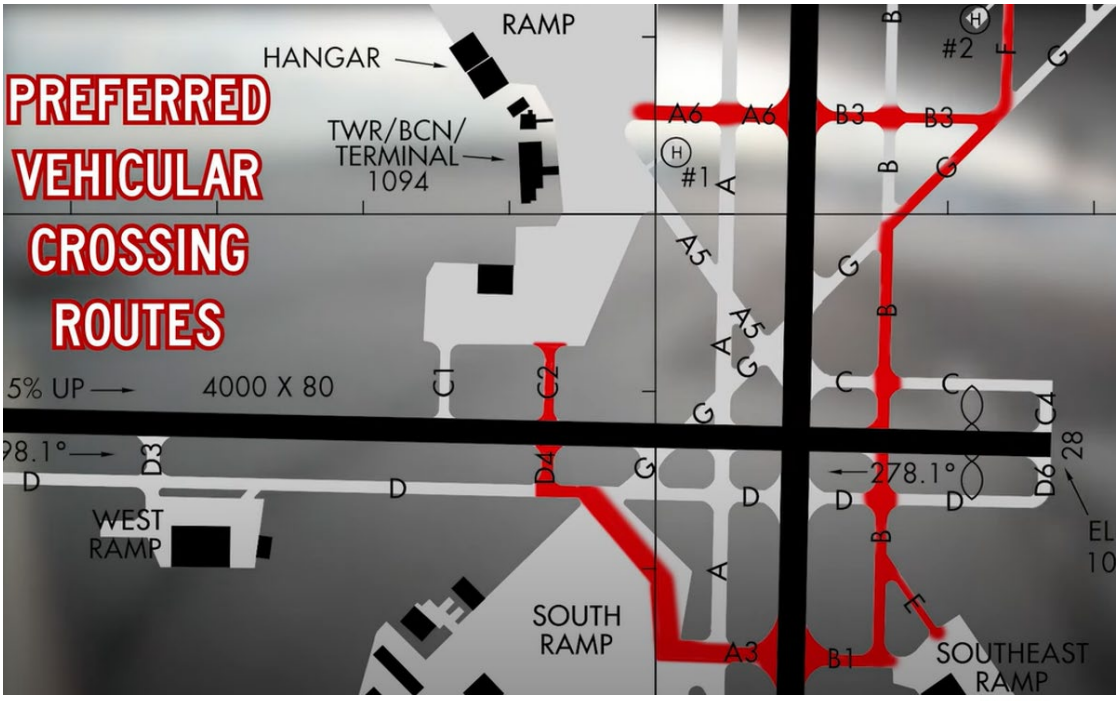
- ✓ You may receive instructions to **cross multiple runways** in a **single clearance** from TWR or Ground Control. This will only occur when the crossings are close to each other and should be obvious on the airport diagram. This procedure is designed to reduce verbiage and frequency congestion. <u>Always remember to ask the TWR if you are unsure of your clearance.</u>

- ✓ KGMU has numerous non-movement areas.
- ✓ Movement areas are **controlled.**
- ✓ All pedestrians, vehicles, or aircraft **must** obtain clearance from TWR or Ground Control to enter all movement areas.



Do Not Cross the Solid Yellow Line without Clearance from TWR or Ground Control

- ✓ KGMU has a very high-volume of vehicle operations. 5 ramp areas located in all quadrants of the airport have led to the establishment of preferred vehicular crossing routes. These are designed to provide the common and most direct routes for vehicular traffic accessing different locations on the airport. Aircraft have priority over vehicle traffic but knowing where you will likely encounter such traffic is helpful.



Additional Cautions

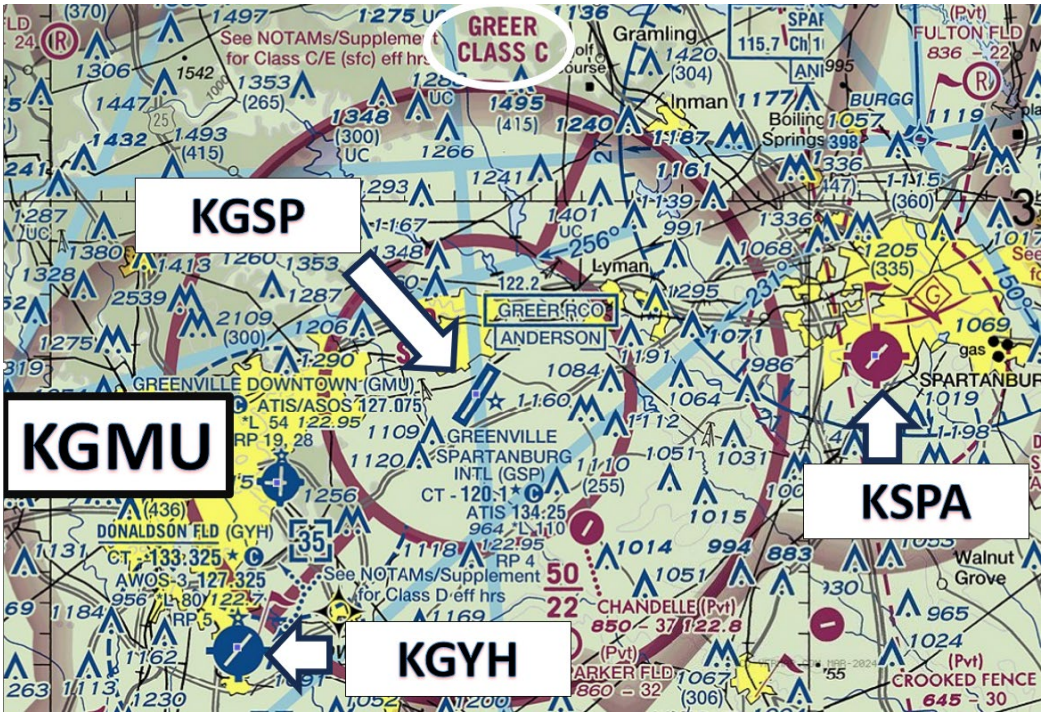
- ✓ Aircraft operating south thru east of the airport should be alert for jet and conventional traffic descending on the KGSP localizer course.
- ✓ Aircraft inbound from the SSW or on ILS RWY 1 approach, be alert for traffic 4.5 miles south operating in the Donaldson Field Airport (KGYH) traffic pattern at 1800´ or below.
- ✓ No aircraft are permitted on TWY C or TWY D when an aircraft greater than 12,500 lbs. is operating on RWY 10/28.
- ✓ RWY 10/28 restricted to small aircraft less than 12,500 lbs., when an aircraft is operating on TWY C or TWY D.
- ✓ Noise abatement procedures in effect, contact airport manager 864–242–4777.
- ✓ Engineered Material Arresting System (EMAS) is installed at the departure end of RWY 1. This system is designed to slow down or stop an aircraft in the event of a RWY over-run. Plans call for installation at the departure end of RWY 19 in the future. Use caution when operating near the RWY end to avoid entering the EMAS surface in non-emergency situations. This can cause damage to its surface.

FROM THE KGMU TOWER CONTROLLERS

The following is local airport specific information that your TWR Controllers want to pass along.

General

- ✓ Near KGMU, there are three public-use airports (KGSP, KGYH and KSPA). These airports have overlapping airspace.
- ✓ Pilots flying into this area for the first time are encouraged to familiarize themselves prior to visiting.

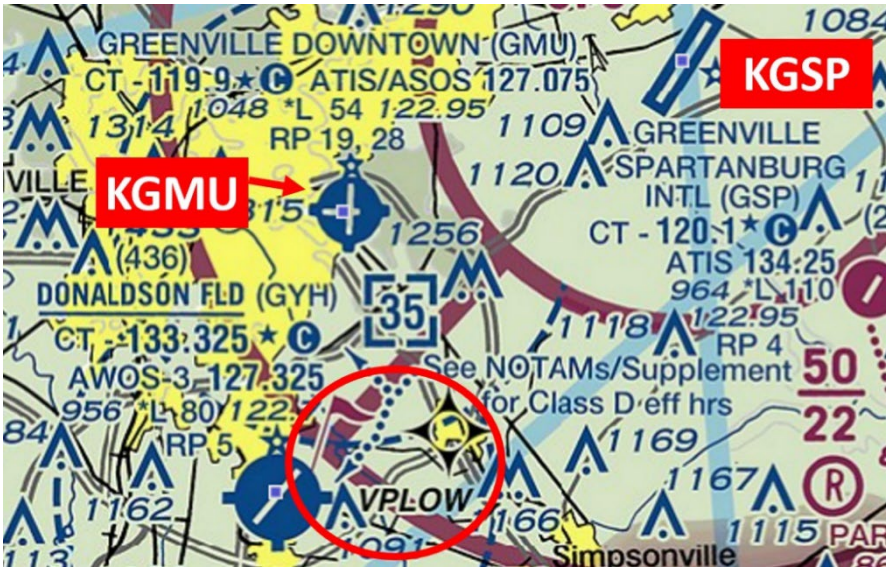


Traffic Patterns

- ✓ Pattern altitude 1800’ MSL/800’ AGL.
- ✓ Large aircraft pattern altitude 2000’ MSL/1000’ AGL

Takeoff/Departure

- ✓ VFR departures must remain clear of GSP Approach Control Airspace.
- ✓ When KGSP is on a north operation, (using RWY 4), all VFR departures wishing for an on course heading of 010° to 190° are required to depart via **VFR waypoint VPLOW** (GMU 165/4.5). See illustration below or accept VFR Flight Following with a VFR squawk.



Arrival/Landing

- ✓ Arrivals must be alert for VFR pattern aircraft at the KGYH airport approximately 5 miles south of KGMU.
- ✓ KGMU arrivals should not descend below 2300 MSL while over-flying KGYH Class D airspace.



This information is subject to change. Not for navigation or legal pre-flight action. Refer to official pre-flight materials such as, but not limited to, NOTAMs, Airport Diagrams, Chart Supplement and VFR charts for the current airport-specific details.

KNOW Before You Go

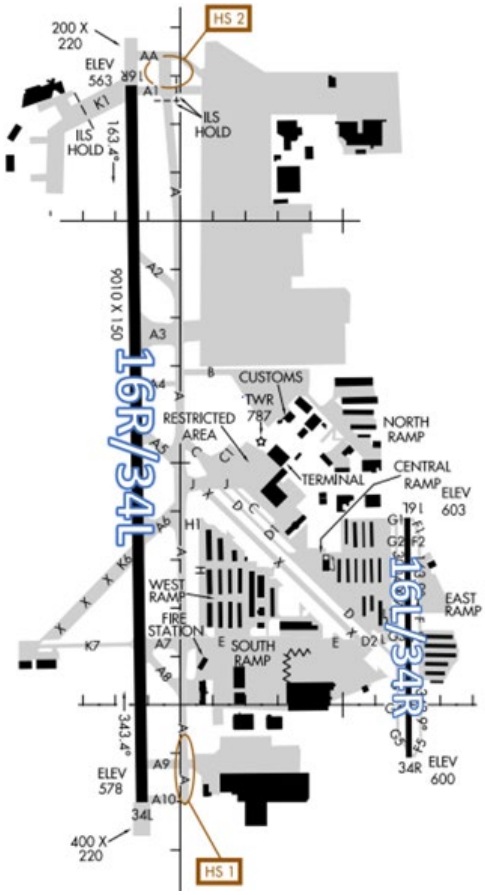
KNOW BEFORE YOU GO

This information is subject to change. Not for navigation or legal pre-flight action.

View the FAA's From the Flight Deck Video to see actual KPAE airport runway approach and taxiway footage combined with diagrams and visual graphics to clearly identify hot spots and other safety-sensitive items.

Seattle Paine Field International Airport (KPAE) is a medium sized multi-use airport, located approximately 25 miles north of Seattle's Sea-Tac International Airport (KSEA), and just east of the Puget Sound in Everett, WA. While it is primarily a general aviation airport, there is a large Boeing Aircraft manufacturing facility on the field. Test flights and taxi tests with large and heavy jet traffic are common. KPAE has daily air carrier operations as well as several flight schools located on the airport.

- ✓ The airport configuration consists of two parallel RWYs with staggered thresholds designated RWY 16L/34R and RWY 16R/34L.
- ✓ There is a full-length parallel TWY associated with both RWYs.
- ✓ TWY system provides access to all services, terminals, and businesses, primarily located between the RWYs.



The **airspace** at KPAE is **Class D** and partially underlies Seattle Class B airspace. (Refer to Sectional Chart.)

KPAE TWR
Hours of Operation – 0700L-2100L
Administrative Office
Open 0700L to 1500L - M through F (may vary)
Business Phone 425-923-1400

Cautions

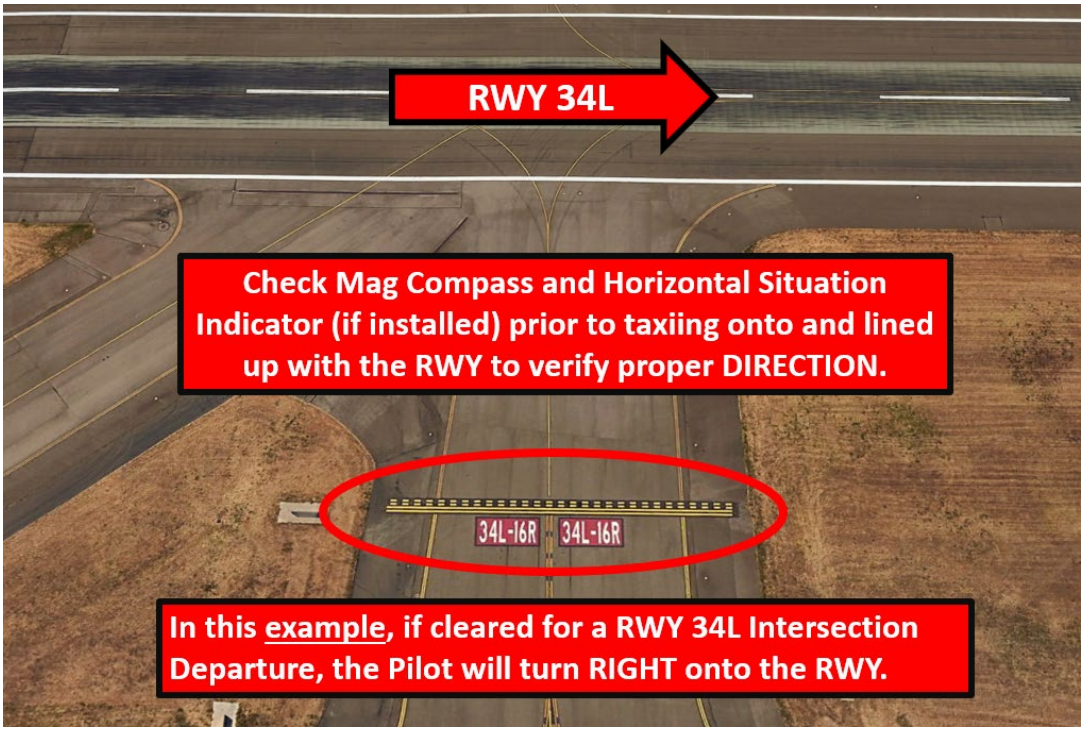
Hot Spots

HS 1 TWY A between TWY A9 and TWY A10 not visible from ATCT.
HS 2 Enter RWY 16 full length via TWY A1 unless TWY AA specified by ATC.

Wrong Surface Intersection Takeoff

- ✓ Pilots lining up or turning in the wrong direction when cleared for an intersection

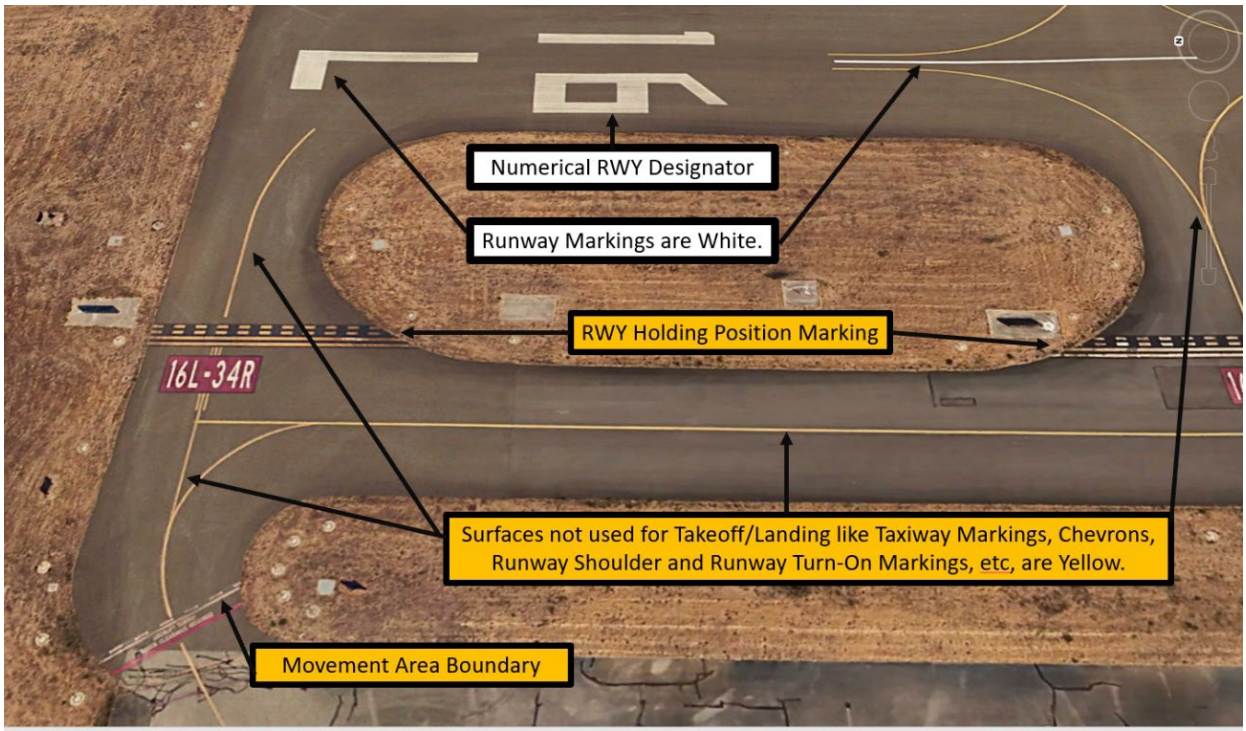
takeoff is a **recurring issue** at KPAE.



- ✓ **Apply the above example to your situation**. If taxiing from the opposite direction the RWY markings will have the numbers reversed.

Wrong Surface Taxiway Takeoff

- ✓ When TWYS parallel RWYs, the potential exists for **taking off on a TWY**.



Wrong Surface Landing

- ✓ At airports with parallel RWYs, the potential exists for landing on the wrong RWY.
- ✓ RWY 16L/34R is half the size of the larger RWY 16R/34L.



- ✓ Staggered RWY thresholds at KPAE increase the risk of mis-identifying and landing on the wrong RWY. See Arrival Alert Notices for more graphics and information.

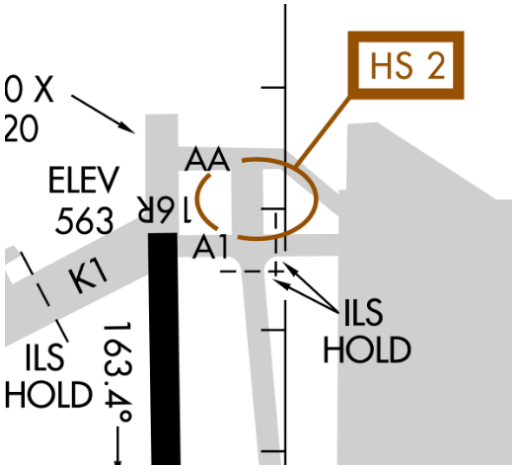
Surface Risk – Movement Area Cautions

- ✓ Hot Spot 1 is located at the south end of TWY A between TWYs A9 and A10. This area is not visible from the TWR. Pilots are urged to provide precise position reports in this area when taxiing to RWY 34L .



Hot Spot 1

- ✓ Hot Spot 2 is located at the approach end of RWY 16R. TWY A1 is the normal route for aircraft taking off on RWY 16R.
- ✓ Pilots requiring TWY AA for the full length of RWY 16R must have TWR approval prior to taxiing north of TWY A1.



Hot Spot 2

FROM THE KPAE TOWER CONTROLLERS

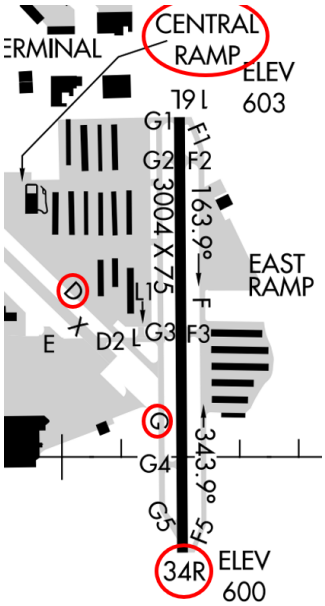
The following is local airport specific information that your TWR Controllers want to pass along.

Traffic Patterns

- ✓ Given the nature of mixed type aircraft operating at KPAE, pattern entries to aircraft may be amended by ATC to better accommodate all users. This includes, but is not limited to, amending pattern entries, holding aircraft outside of Class Delta airspace, or changing runway assignment.
- ✓ RWY 16L/35R is closed when TWR is closed. Use CTAF 132.95.

Ground Control

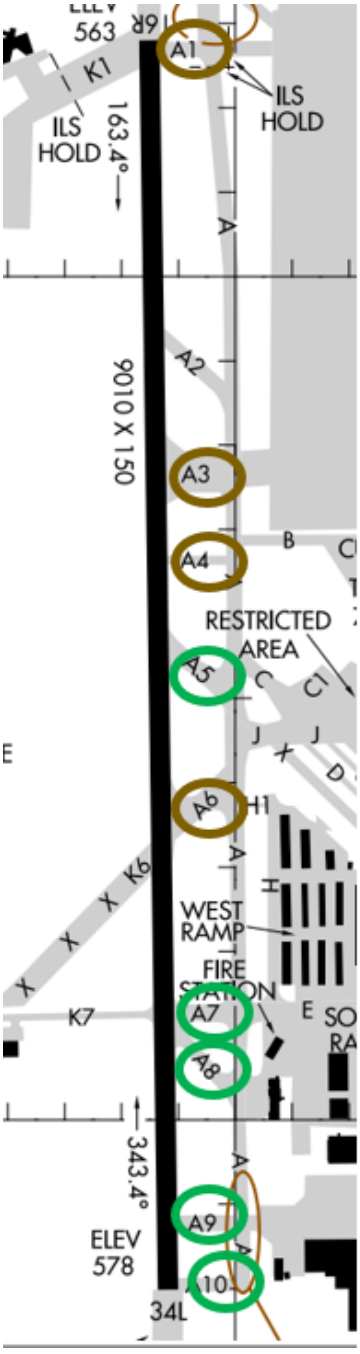
- ✓ Aircraft waiting to leave the central ramp to taxi to RWY 16L/34R may need to specify if they are closer to TWY G or TWY D on initial call up.
- ✓ Sometimes taxi instructions to RWY 34R are issued utilizing TWY D to TWY G and some aircraft will utilize TWY G only.
- ✓ Providing this detail can help alleviate issues with potential taxi conflicts and minimize frequency congestion during busy traffic periods.



- ✓ Aircraft requesting the full length on RWY16R/34L may need to give way to taxiing jets which may include moving aircraft to the TWY A9 intersection for RWY34L, requesting they conduct a run up closer to the Boeing North Ramp or by the TWY AA intersection for RWY16R, if requested by ATC.

Takeoff/Departure

- ✓ KPAE has experienced **Wrong Surface Intersection Departures**, especially when departing RWY16R/34L because of the angle of the TWYs.
- ✓ In these events, the aircraft involved read back the appropriate information to the controller but either started take-off roll or lined up in the **wrong direction**.



- ✓ To mitigate this, **RWY16R intersection departures will be assigned TWYs A1, A3, A4 and A6 intersections.**
- ✓ **RWY 34L intersection departures will be assigned TWYs A10, A9, A8, A7 and A5 intersections.**
- ✓ Pilots should always verify that their heading indicator aligns with the assigned RWY.
- ✓ When departing RWY16L/34R, advise TWR that you are ready for take-off only when you are number one at the hold short line for your respective intersection. This alleviates unnecessary frequency congestion since aircraft are unable to taxi past one another here.

Arrival/Landing

- ✓ Remain vigilant to your **assigned** RWY. KPAE has experienced wrong surface landings.
- ✓ Ask ATC for clarification immediately if you are not sure of your assigned RWY.



- ✓ Airport Road, which is a four-lane highway that runs north-south from the Boeing Fwy and the Boeing plant, may be confused as RWY16L before it makes a slight turn to the southeast. Pilots who are not familiar with the airport or the area, when making a “straight-in” approach from the north or turn a one/two-mile left base for the runway should be aware of this. This confusion is increased during sunset when visibility is impacted by the sun.
- ✓ The intersection of RWY16L/34R and TWYs G and TWY G3 is a place of frequent congestion.
- ✓ Arriving aircraft exiting the RWY at TWY G3 may receive complex taxi instructions to allow following aircraft to exit at TWY G3.
- ✓ Certain aircraft, like the Embraer 135 and the Boeing 737, are equipped with a Traffic Alert and Collision Avoidance System (TCAS), that may trigger an avoidance maneuver if that system senses a potential collision. This may involve a change of direction and altitude. To avoid this from happening in the traffic pattern, TWR may direct aircraft to make some adjustments like extending or widening pattern legs or even executing a 360-degree turn.

Special Traffic (Military / Commercial / Helicopter, etc.)

- ✓ Boeing test aircraft may have requests that are not routine.
- ✓ Accommodating regular commercial service may cause brief delays for other users to RWY 16R/34L.
- ✓ Aircraft may be asked to make a full stop taxi back or change to RWY 16L/34R if reasonable to accommodate these requests.

Additional Information

- ✓ Limiting cockpit distractions may reduce hear-back/read-back errors and help to reduce ATC workload and increase overall safety.
- ✓ Noise sensitive airport; for noise abatement procedure and traffic procedure call airport operations 425-388-5125. It is required that pilots adhere to noise abatement procedures unless otherwise instructed by ATC.
- ✓ First 1000'of RWY 16R is concrete.
- ✓ Avoid low level overflight of Boeing ramp and NE corner of airport due to jet blast.

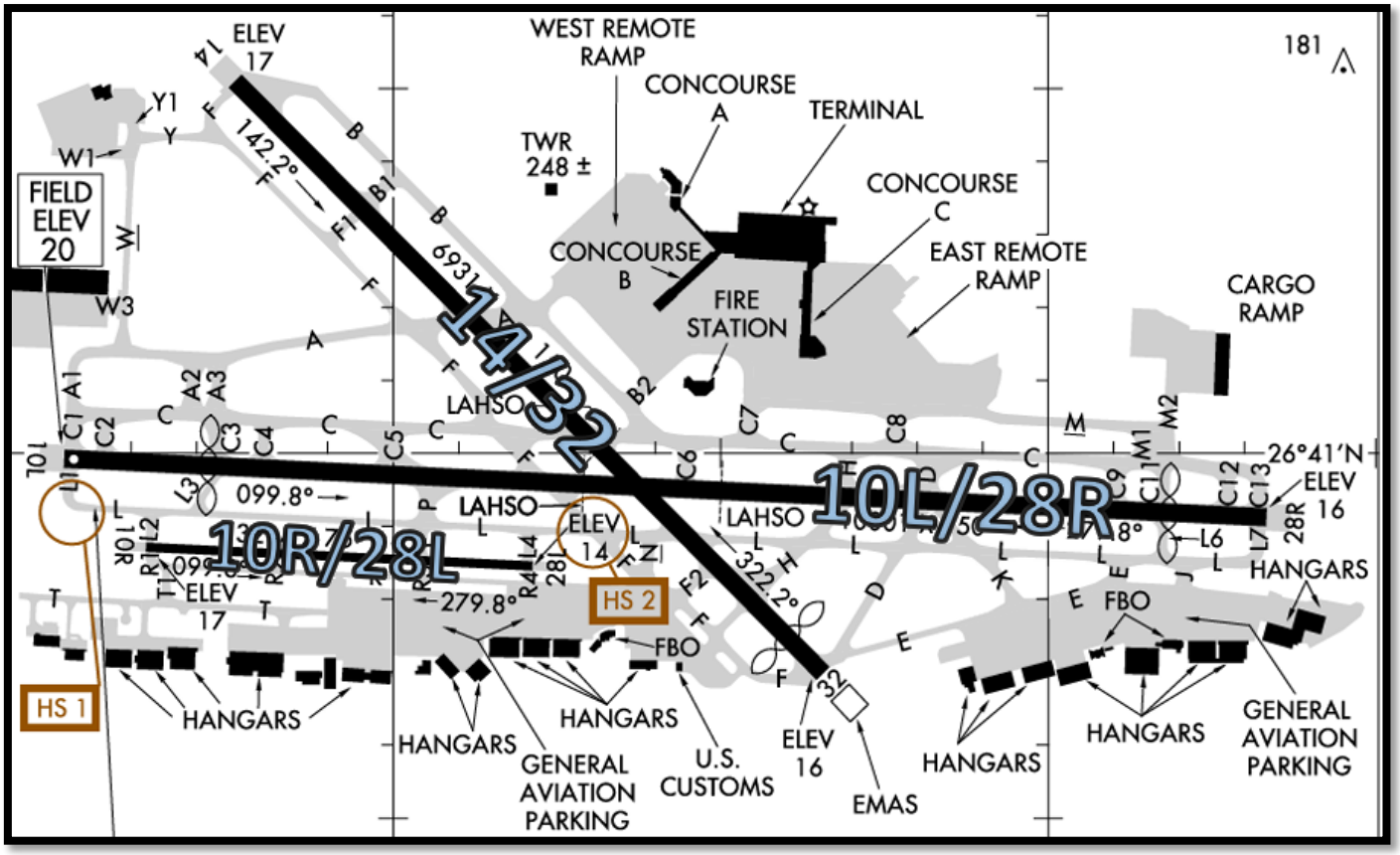
This information is subject to change. Not for navigation or legal pre-flight action. Refer to official pre-flight materials such as, but not limited to, NOTAMs, Airport Diagrams, Chart Supplement and VFR charts for the current airport-specific details.

KNOW BEFORE YOU GO

This information is subject to change. Not for navigation or legal pre-flight action.

View the FAA's From the Flight Deck Video to see actual KPBI airport runway approach and taxiway footage combined with diagrams and visual graphics to clearly identify hot spots and other safety-sensitive items.

Palm Beach International Airport (KPBI) is a medium-sized, mixed-use airport located on the east coast of Florida, between the cities of West Palm Beach and Lake Worth. Pilots who are not familiar with the area should be aware that North Palm Beach County General Aviation Airport (F45) is located approximately 10 miles northwest with a very similar RWY configuration. The traffic mix at KPBI consists of air carrier, corporate, and general aviation. Several flight schools use KPBI to expose student pilots to towered airport operations.



- ✓ KPBI has two parallel RWYs designated RWY 10L/28R and RWY 10R/28L.
- ✓ Note that RWY 10L/28R is much longer and wider than parallel RWY 10R/28L.
- ✓ RWY 10R/28L has staggered thresholds at both ends.
- ✓ A third RWY designated RWY 14/32 intersects RWY 10L/28R.

There is a complex TWY system that provides access to all facilities. General aviation and corporate facilities are located on the north and south sides of the airport.

The **airspace** at KPBI is **Class C**. (Refer to Sectional Chart)

KPBI TWR
Hours of Operation – 24 hours
Administrative Office
Open 0730L to 1600L - daily
Business Phone 561-275-1401

CAUTIONS

Hot Spots

HS 1 RWY 10L hold short line on TWY L is located prior to the bend in the TWY.

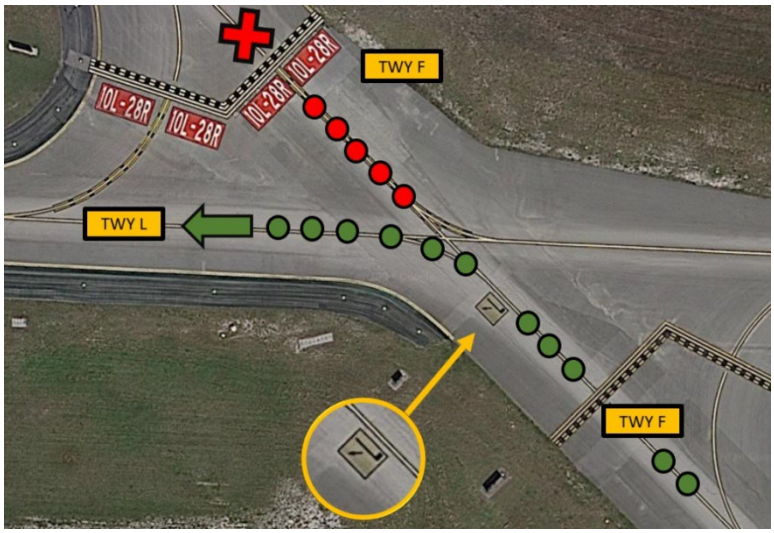
- ✓ Pilots have failed to recognize that the hold short line is located on TWY L and have made the turn onto TWY L1 and entered the Runway Safety Area for RWY 10L.



Hot Spot 1

HS 2 Aircraft NW-bound on TWY F missing left turn onto TWY L.

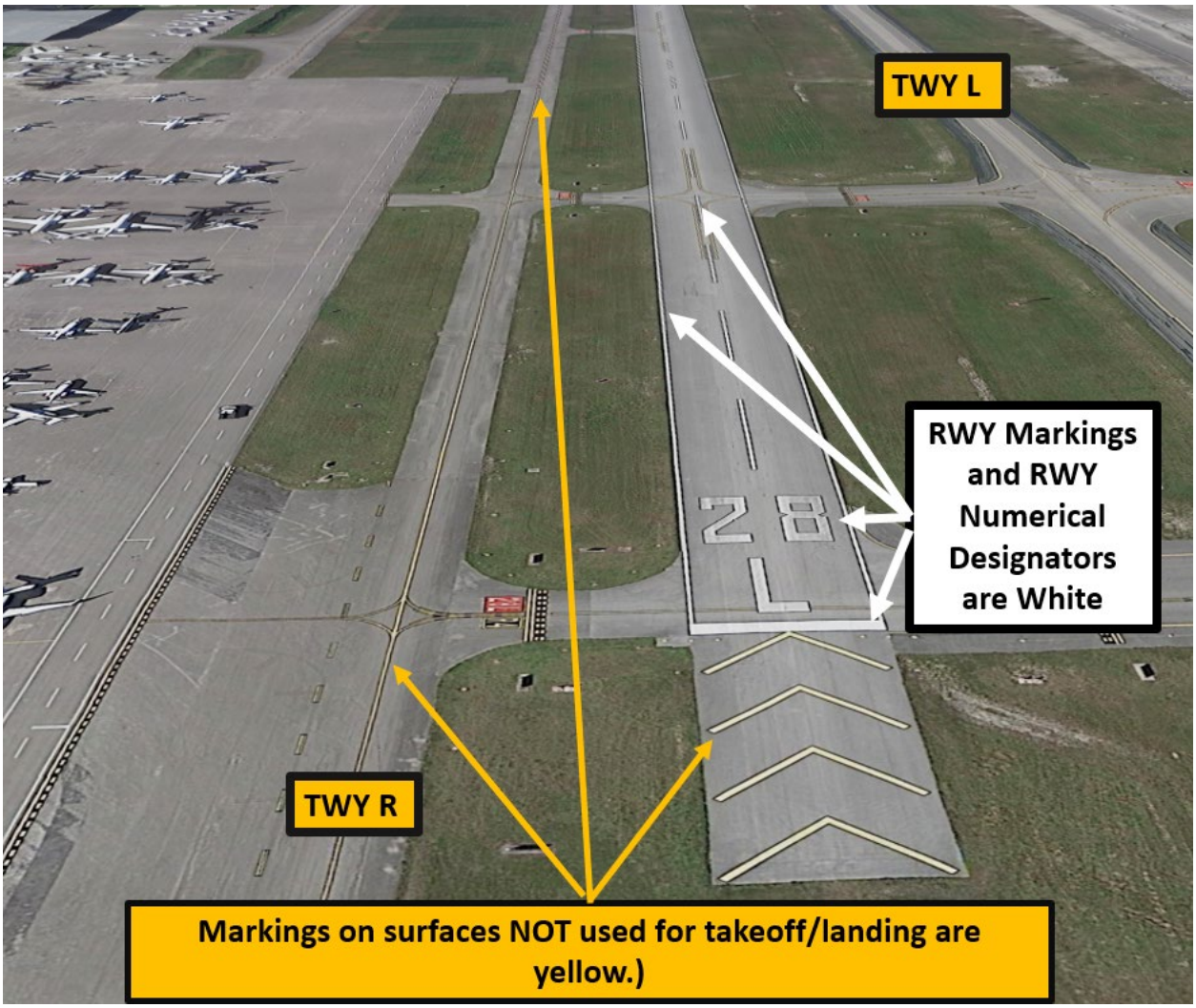
- ✓ Pilots taxiing from the south side of the airport and cleared to RWY 10L via TWY F to join TWY L have missed the turn and entered RWY 10L/28R.



Hot Spot 2

Wrong Surface TWY Takeoff

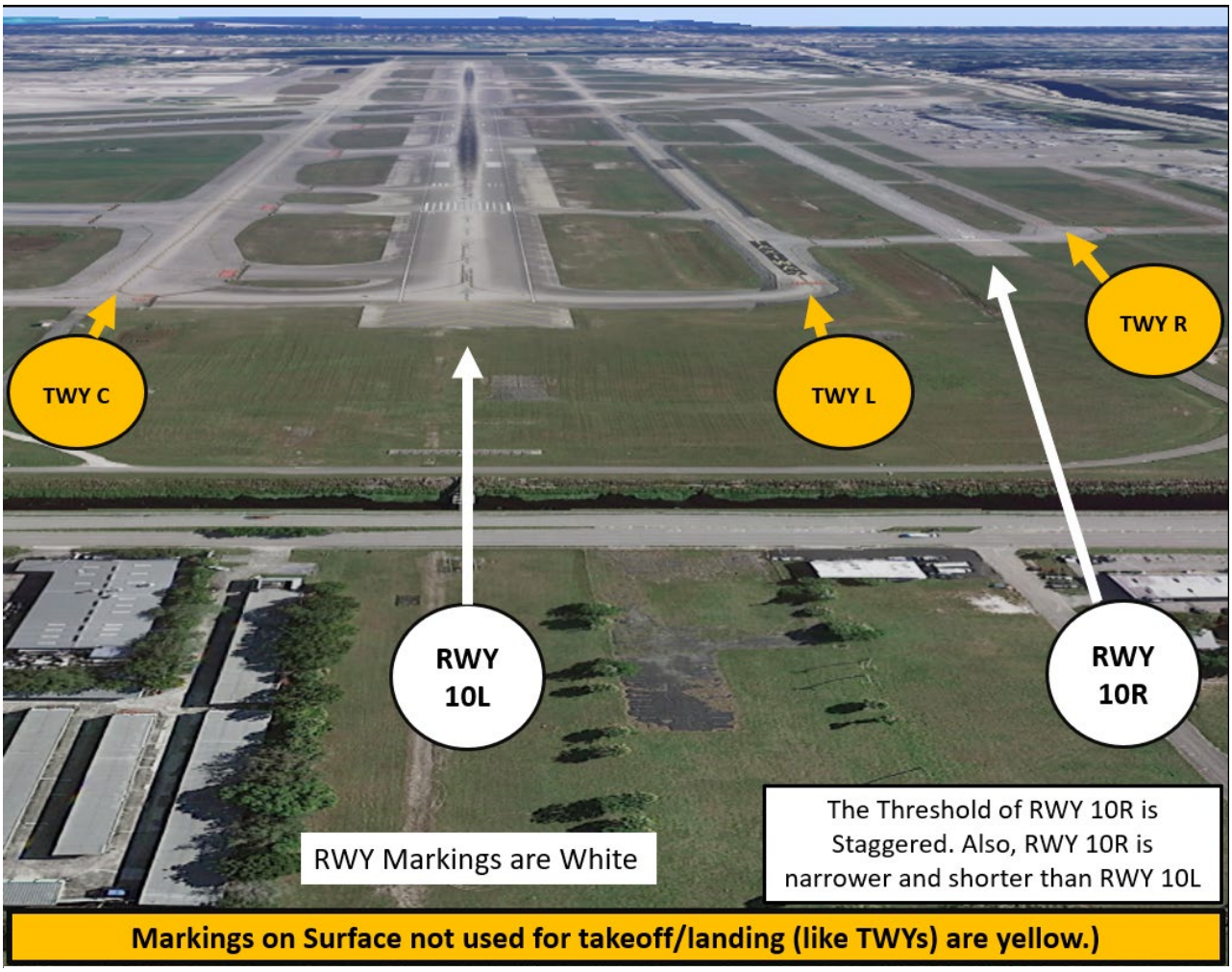
- ✓ Numerous TWYs parallel all RWYs at KPBI.
- ✓ Some of these run full length and can be mistaken for a RWY.
- ✓ The potential exists for a pilot to take off on a TWY.
- ✓ The illustration below is an example that illustrates TWY R and its position relative to RWY 28L.
- ✓ Note that this example applies to any airport.



Parallel TWY R and RWY 28L

Wrong Surface RWY Landing (See Arrival Alert Notices.)

- ✓ Parallel RWYs with staggered thresholds increase the risk for a Wrong Surface RWY Landing. The pilot may be drawn to the first RWY that comes into view when the thresholds are staggered.
- ✓ The pilot may land on the larger or more dominant RWY.
- ✓ If available, programming the instrument approach procedure to the RWY may help to identify the correct RWY.



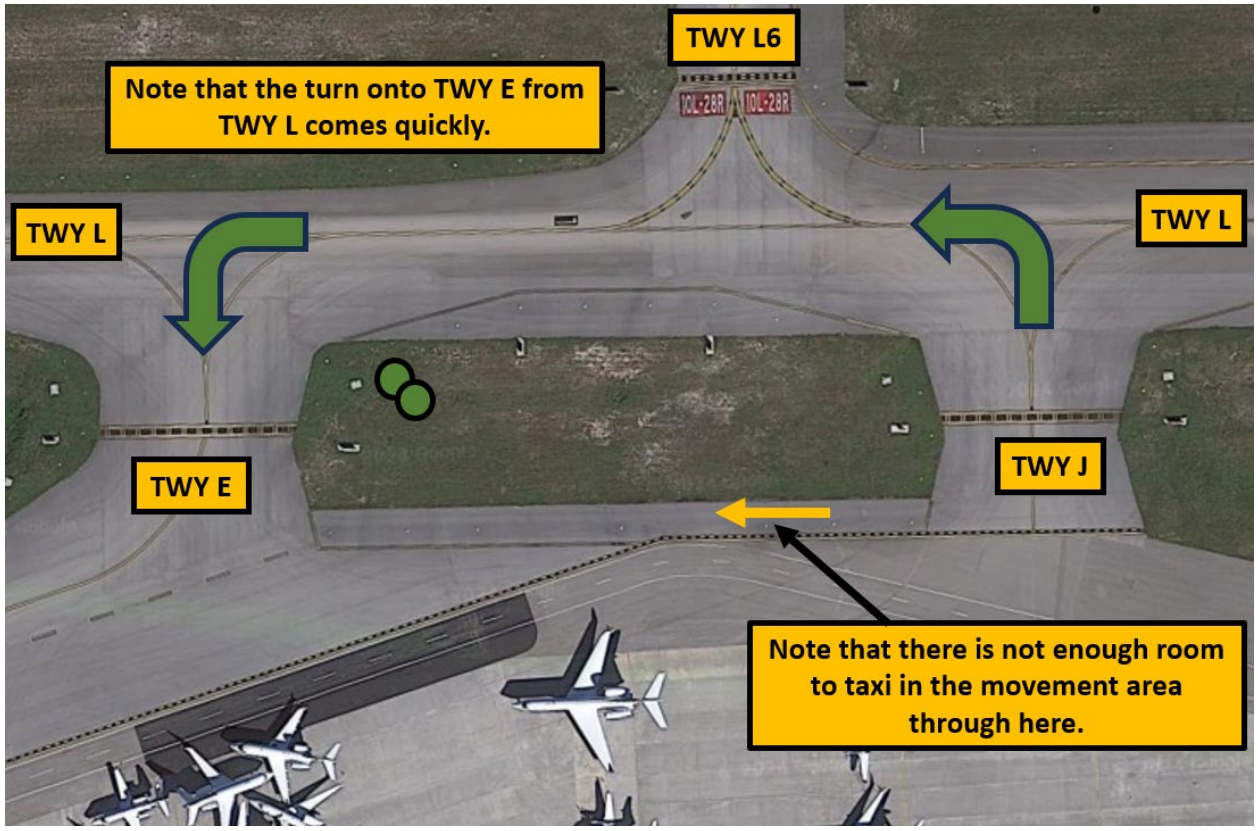
Parallel RWYs with Staggered Thresholds and Parallel TWYS

Wrong Surface TWY Landing

- ✓ Like taking off on a TWY, (see "Wrong Surface TWY Takeoff" above), the risk of **landing** on a TWY increases whenever a TWY runs parallel to a RWY.
- ✓ Programming an instrument approach procedure may prevent the pilot from lining up and landing on a TWY.

Surface Risk – Movement Area Cautions

- ✓ Aircraft coming out of Jet Aviation, during east traffic operations, and instructed to taxi via TWY J, TWY L, TWY E should note that **TWY E comes up very quickly** once you have turned onto TWY L. (See illustration below.)



- ✓ There is a **vehicle service road** near the customs ramp. This is not a TWY. (See illustration below).



Do not confuse this Vehicle Service Road with TWY F.

Additional Cautions

- ✓ Land and Hold Short Operations (LAHSO) may be conducted on:

Landing RWY	Hold Short Point
RWY 10L	14/32
RWY 14	10L/28R
RWY 28R	14/32

- ✓ Noise abatement procedures are in effect.
- ✓ RWY 14 has Engineered Material Arresting System installed at Departure End.

FROM THE KPBI TOWER CONTROLLERS

The following is local airport specific information that your TWR Controllers want to pass along.

Ground Control

- ✓ During periods of busy departure demand (i.e., Sundays from December – April), PBI will normally open Gate Hold for air carrier and business traffic.
  - Generally, once an aircraft receives their clearance, they will be instructed to contact Gate Hold for an engine start time once they are ready to depart.
  - Gate hold will then instruct the aircraft to monitor Ground Control at the appropriate time.
  - Generally, Gate Hold tries to meter aircraft in 15-minute increments with an attempt to keep 7-10 aircraft at the end of the runway, ready for departure.
- ✓ Frequency congestion on Ground Control becomes an issue when ground stops or re-routes are initiated, because aircraft then start requesting re-routes or new times.
  - It is recommended that you contact clearance delivery if you want to inquire about a new route or time.
  - Do not contact ground control, as they are focused on aircraft movement on the airfield.
- ✓ As a best practice, it is best to be patient and wait for the controller to reach out to you, versus tying up the frequency while other aircraft are attempting to get their initial clearances.
- ✓ Another best practice is to monitor ground control (versus checking in) when instructed by gate hold. By monitoring ground control, the ground controller can ensure he/she talks to the right aircraft at the right time to set up the sequence for local control based on miles in trail, EDCTs, etc.
- ✓ Aircraft that taxi from Jet East ramp can expect taxi instructions via Juliette, Lima, Echo for runway 10L, 14, or 10R.
  - Use caution for a quick left turn from Lima onto Echo.

Runway Crossings

- ✓ The controllers at PBI will be specific with runway crossing instructions.
- ✓ Ensure you readback all runway crossing instructions [with call sign].

Departure/Takeoff

- ✓ Aircraft should expect to fly the RNAV SIDS unless otherwise instructed or equipment limitations prevent this.
    - During periods of heavy departure demand, you may be issued an initial departure heading and altitude. In these cases, expect to resume the assigned SID.

Arrival/Landing

- ✓ Runway 10R/28L is hard to see and the threshold for 10R/28L does not align with runway 10L/28R [staggered – see illustration below].
- ✓ Many aircraft mistake taxiway Lima for runway 10R/28L.
- ✓ Ensure you have runway 10R/28L clearly in sight prior to short final.
  [TWY L is located between RWYs 10L/28R and RWY 10R/28L – see illustration below.]
  [TWY L is wider and longer than RWY 10R/28L.]
  [Do not confuse TWY L for the RWY - See illustration below.]



RWY 10R/28L parallels TWY L to the north and TWY R to the south.

Weather

- ✓ KPBI airspace is exposed to thunderstorms predominantly from June through October.
- ✓ LLWAS equipment is available at KPBI to help detect windshear around the field.
- ✓ PIREPs are always appreciated, including PIREPs for no significant weather when thunderstorms are forecast for the area.

Special Traffic

- ✓ KPBI has a variety of helicopters on the field, including law enforcement, local news, agriculture, and medevac.
- ✓ Use caution for low flying helicopters as you approach the field from the east and west.
- ✓ KPBI uses a “shoreline” transition procedure to allow VFR aircraft to transition from north to south (or vice versa) at low altitudes. Generally, these aircraft will be at 500’ over the shoreline or 1,000’ 1NM offshore.
- ✓ Use caution when departing runway 10L for these low flying aircraft.

Additional Information

- ✓ Due to the location of KPBI, expect frequent TFRs for VIP movement and special events.
  - Always check NOTAMs prior to flying in/around KPBI airspace to ensure these TFRs are not in effect.
  - TFR restrictions will be listed in the NOTAM.
  - These TFRs are subject to frequent change.
- ✓ During periods of high volume at KPBI, expect excessive delays for practice approach requests.
- ✓ KPBI will initiate programs to manage traffic inbound to KPBI during periods of high arrival traffic. During these times, pilots changing their destination from a different airport to KPBI may have their request denied.

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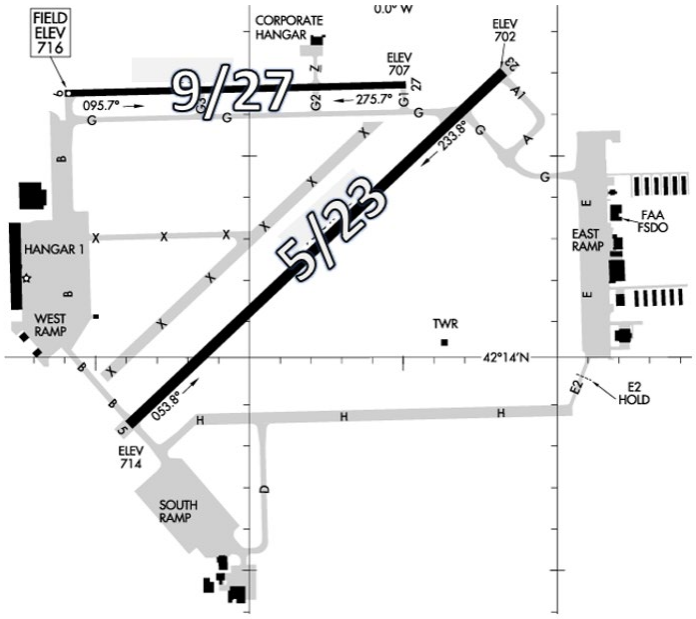
KNOW BEFORE YOU GO

This information is subject to change. Not for navigation or legal pre-flight action.

The FAA will release a From the Flight Deck Video which will highlight actual KYIP airport runway approach and taxiway footage combined with diagrams and visual graphics to clearly identify hot spots and other safety-sensitive items.

Willow Run Airport (KYIP) is a general aviation airport located on the eastern edge of the city of Ypsilanti, Michigan, and approximately eight miles west of the Detroit Metro Wayne County Airport (KDTW). It serves local and transient general aviation, business, air taxi and military operations. Combined with several flight schools located on the airport, the traffic mix makes for a wide range of pilot experience and aircraft performance.

The airport configuration consists of two runways (RWYs) designated RWY 5/23 and RWY 9/27. These RWYs converge at the northeast end of the field but do not intersect.



A complex taxiway (TWY) system provides access to all businesses on the field, including the FBO and ramp areas which are in all four quadrants of the airport.

KYIP Tower
Hours of Operation – 24 hours
Administrative Office
Open 0730L to 1700L - M through F
Business Phone 734-961-6845

The **airspace** at KYIP is **Class D** and underlies Detroit Class B airspace. (Refer to Sectional Chart.)



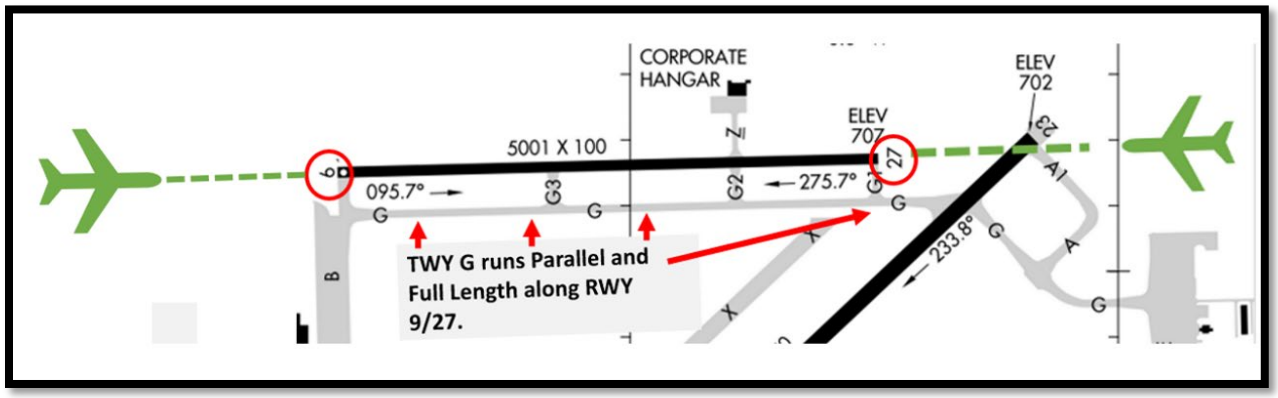
Cautions

Hot Spots

There are no Hot Spots at KYIP.

Wrong Surface TWY Takeoff and Landing

- ✓ Be alert to TWYs that parallel RWYs. They have been mistaken for the adjoining RWY for both takeoff and landing.
- ✓ **At KYIP, TWY G runs full-length and lies just south of RWY 9/27 (see illustration below).**
- ✓ Always use the Airport Markings and Signage along with the published Airport Diagram to verify your position.
- ✓ Surface "Markings" for RWYs are always WHITE. Markings on surfaces that are not used for takeoff or landing are painted YELLOW.
- ✓ Additionally, RWYs are identified by a WHITE number painted at the approach end.



TWY G in relation to RWY 9/27

- ✓ **Another potential for a Wrong Surface Landing exists on a closed surface marked with X's.**
- ✓ This surface parallels and lies just north of RWY 5/23.





FROM THE KYIP TOWER CONTROLLERS

The following is local airport specific information that your TWR Controllers want to pass along.

General

- ✓ KYIP is home to two flights schools, MANG Aero Flying Club, ATP Flight School, and Crosswinds Aviation.

Traffic Patterns

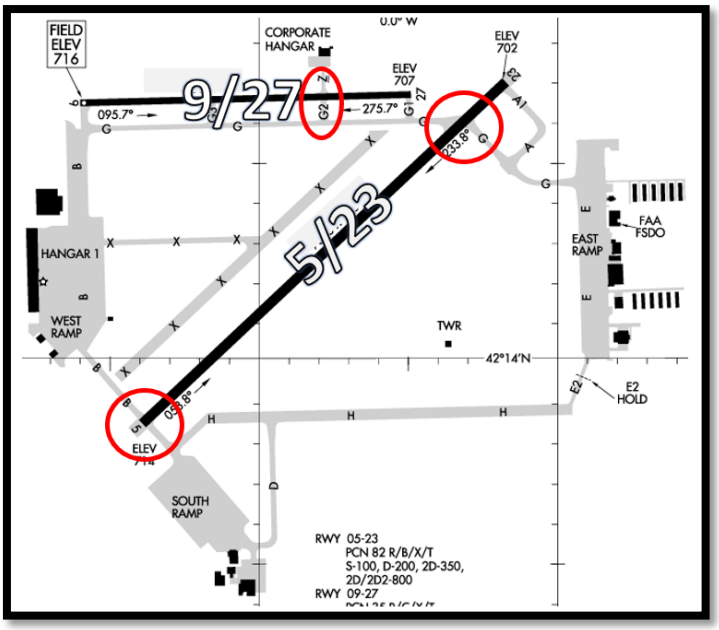
- ✓ TWR will assess the current hourly winds and based upon them they will conduct either left or right traffic on RWYs 5/23 and/or RWYs 9/27.
- ✓ Please fly a standard traffic pattern in accordance with the AIM and the FAA Airplane Flying Handbook unless otherwise approved or directed by the controller.
- ✓ Request early turns and non-standard traffic patterns from the controller.

Ground Control

- ✓ You can contact KYIP Ground Control on 119.975. They also monitor Clearance Delivery on 118.175.
- ✓ KYIP east, west, and south ramps are uncontrolled. All aircraft must contact Ground Control for instructions onto active TWYs.
- ✓ Readback of all hold short instructions are mandatory.

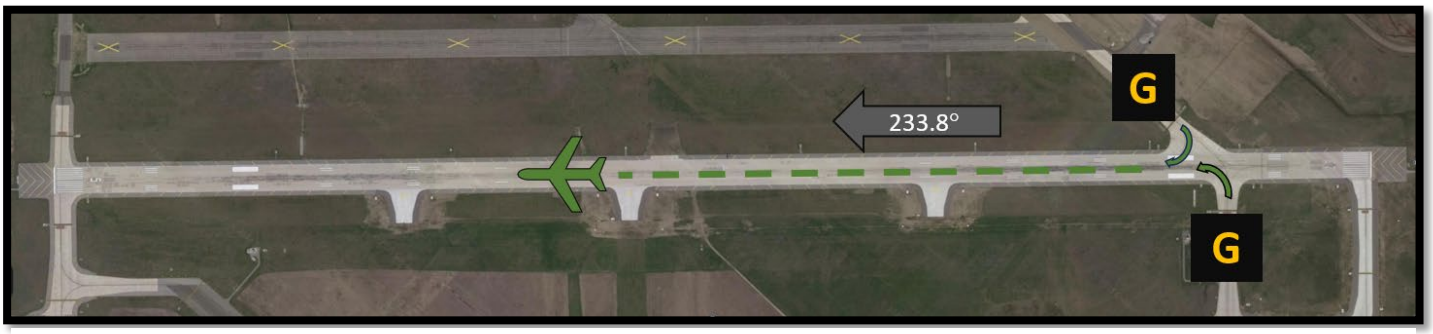
RWY Crossings

- ✓ RWY crossings take place at three locations.
  - TWY Z and G2 (RWY 9/27).
  - TWY G (RWY 23 approach end),
  - TWY B (RWY 5 approach end).



Takeoff/Departure

- ✓ TWR frequency is 125.275 (VHF) and 256.9 (UHF).
- ✓ When KYIP is departing RWY 23, intersection takeoffs at TWY G are available upon request.
- ✓ When pattern work is being conducted on RWY 9/27, departing RWY 23 from TWY G will be the most expeditious (upon request).



TWY G Intersection Takeoff RWY 23

- ✓ Distance remaining on RWY 23 at TWY G intersection is 6,700 ft.
- ✓ At an intersection, the white numerical RWY Designators may not be visible.
- ✓ Use the red RWY Holding Position markings/signs to identify the RWY.
- ✓ Before entering the RWY and when lined up on the RWY, **check** the Magnetic Compass and the Horizontal Situation Indicator (HSI), if installed, to **verify** that the aircraft is pointed in the **correct direction**.

Arrival/Landing

- ✓ Detroit Approach will normally sequence all IFR aircraft to RWY 5/23. YIP ATCT may change this RWY assignment and/or sequence due to VFR traffic in the KYIP Class D airspace, normally upon initial contact.
- ✓ VFR Practice Instrument Approaches are covered in Letter to Airmen: LTA-D21-32 which can be found in NOTAMS.
- ✓ **When inbound to RWY 9/27, ensure that you are lined up with the numbered RWY surface and not the parallel TWY.** (See Wrong Surface TWY Takeoff and Landing section above.)

Special Traffic (Military / Commercial / Helicopter, etc.)

- ✓ Helicopter operations are not permitted or conducted on the south ramp.

This information is subject to change. Not for navigation or legal pre-flight action. Refer to official pre-flight materials such as, but not limited to, NOTAMs, Airport Diagrams, Chart Supplement and VFR charts for the current airport-specific details.

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION

National Policy

ORDER NUMBER 5300.1G
Effective Date: 9/29/17

SUBJ: Modifications to Agency Airport Design, Construction, and Equipment Standards

1. Purpose of this Order. This order establishes the process for the initiation, revision, coordination, and management of Modifications of Standards (MOS) applicable to airport design, construction material, and equipment projects. This order is the foundation of a web-based automated application of MOS. The automated application for submitting MOS is a step-by-step process facilitated within Airports Geographic Information System (AGIS).

2. Applicability. This order is applicable to all projects funded under the Airport Improvement Program (AIP) and Passenger Facility Charge (PFC) programs at all obligated airports, or as required to support any public approach procedure. Eligibility determinations under AIP or PFC are independent of any approval action for an MOS. New MOS requests initiated after March 31, 2018, must use the automated MOS process. Manual MOS processing must follow applicable sections of this order as it applies to current regional procedures until the automated tool is accessible.

3. Cancellation. This order cancels Federal Aviation Administration (FAA) Order 5300.1F, *Modifications to Agency Airport Design, Construction, and Equipment Standards*, dated June 30, 2000.

4. Audience. This order applies to all Office of Airports (ARP) personnel.

5. Definitions.

a. Design Standards. Standards applying to the dimensional criteria of runways, taxiways, and location of associated infrastructure found in Advisory Circular (AC) 150/5300-13, *Airport Design*; and current 150/AC series.

b. Construction Standards. Standards applying to installation methods and tolerances found in AC 150/5370-10, *Standards for Specifying Construction of Airports*.

c. Equipment Standards. Standards applying to snow removal, Aircraft Rescue and Fire Fighting (ARFF) and other equipment ACs among the 150/series.

d. Materials Standards. Standards applying to the approval of type, properties, or characteristics of materials found in AC 150/5370-10.

e. Modification of Standards (MOS). Any deviation from, or addition to standards, applicable to airport design, material, and construction standards, or equipment projects resulting in an acceptable level of safety, useful life, lower costs, greater efficiency, or the need to accommodate an unusual local condition on a specific project through approval on a case-by-case basis.

6. Exemptions. This order does not cover exemptions from Title 14 Code of Federal Regulations (CFR) Part 139, *Certification of Airports,* or from Part 77, *Safe, Efficient Use, and Preservation of the Navigable Airspace.*

7. Background. Laws, regulations and Airport Sponsor Grant Assurances require compliance with current FAA standards. The following provisions require an airport to meet FAA standards:

a. Airport and Airway Improvement Act. The Airport and Airway Improvement Act of 1982 ("the Act"), Public Law 97-248, codified in subchapter I of Chapter 471, Title 49 of the United States Code, as amended, requires an airport requesting an AIP grant to comply with FAA standards. The statute states in part, "An application for a project grant under this subchapter may propose airport development only if the development complies with standards the Secretary prescribes or approves, including standards for site location, airport layout, site preparation, paving, lighting, and safety of approaches."

b. Airport Improvement Program (AIP) Grant Funded Projects. Grant Assurance No. 34, *Policies, Standards, and Specifications*, requires a federally obligated airport to "carry out the project in accordance with policies, standards, and specifications approved by the Secretary, including but not limited to, the advisory circulars listed in the current Advisory Circulars for AIP Projects, ... and in accordance with applicable state policies, standards, and specifications approved by the Secretary."

c. Obligated Airport. Title 49 U.S.C. § 47107(a)(16) and Grant Assurance No. 29, *Airport Layout Plan*, require the airport to maintain an up-to-date Airport Layout Plan (ALP) depicting existing and future airport facilities as referenced in paragraph 12.b. AC 150/5070-6, *Airport Master Plans*, establishes standards for ALPs, which includes the requirement to identify unusual design features and/or modifications to FAA Airports design standards. FAA approval of an ALP indicates the existing or proposed development depicted on the ALP conforms to FAA airport design standards or that an approved modification to standards has been issued.

d. Passenger Facility Charges (PFC). Title 14 CFR Part 158, *Passenger Facility Charges, Appendix A — Assurances 9, Standards and Specifications*, states, "The public agency hereby assures and certifies, with respect to this project that: ...It will carry out the project in accordance with FAA airport design, construction, and equipment standards and specifications contained in advisory circulars current on the date of project approval."

e. Runway Safety Areas (RSAs).

(1) A MOS is not issued for RSA dimensions. Instead, the Regional Airports Division Manager will evaluate RSAs and issue a RSA determination in accordance with FAA Order 5200.8, *Runway Safety Area Program*, and FAA Order 5200.9, *Financial Feasibility and Equivalency of Runway Safety Area Improvements and Engineered Material Arresting Systems*, for each affected runway at federally obligated airports and airports certificated under 14 CFR Part 139 within their geographic purview. For further information on RSA design standards, see AC 150/5300-13.

(2) To capture operational mitigations and establish an acceptable level of safety where parallel taxiways are within the RSA, use a runway to parallel taxiway separation MOS.

(3) A MOS may be considered for RSA grading where existing conditions may not allow for a feasible cost beneficial solution.

f. Procurement Requirements for Federally Assisted Projects. The procurement requirements for Federally assisted projects are typically conveyed to prospective bidders in two locations in a sponsor's procurement document: 1) General Provisions, AC 150/5370-10 sections 10–90, and 2) the sponsor's front end procurement documents (e.g. instructions-to-bidders, bid form, supplementary conditions, etc.). Proposed changes to the General Provisions of AC 150/5370-10 require conformance to this order. Proposed changes to AIP procurement standards (2 CFR §§200.318-200.326), applicable regulatory provisions such as Disadvantaged Business Enterprise requirements (49 CFR Part 26) or AIP statutory requirements such as Buy American Preference (49 U.S.C § 50101) require the airport to directly coordinate with the FAA Airports District Office for allowability and course of action for FAA review.

8. Policy. A national policy for MOS ensures uniformity in the application of standards.

a. An airport must submit a request for a modification of design standards for:

(1) Any proposed deviations from standards during the review of airport design and siting standards.

(2) Any proposed design elements on an airport project not meeting standards.

(3) Any proposed (new scheduled) operations of a higher category of aircraft, regardless of the number of operations, or an increase in service level (for example from CAT I to CAT II) proposed to operate on existing infrastructure that does not meet the standards.

(4) MOS may also be necessary as part of a proposed waiver, Air Traffic Control (ATC) Standard Operating Procedure (SOP), or a Letter of Agreement (LOA).

b. Subject to the limits of paragraph 10, an airport must submit a modification of materials specifications request if available materials cannot meet the requirements of the specification or are at a significantly higher cost.

c. An airport must submit a request for a modification of construction installation method and tolerances (best practices) when it result in cost savings or greater efficiency without sacrificing safety or useful life, and is subject to the limits of paragraph 10.

d. An airport must submit a modification of equipment standards request only when justified by unusual local conditions.

e. An airport may submit a request for a modification from the general provisions of AC 150/5370-10 if the proposed changes are required to conform to local laws and regulations. An airport may bundle all of the revisions in the general provisions sections 10 – 110 into one request.

f. Duration of an MOS Approval:

(1) MOS that are applicable to material and/or construction standards are approved for the life of the project.

(2) All MOS associated with design standards expire no later than 5 years from the approved date. The airport must re-submit the MOS for review and approval if an extension is requested.

(3) All MOS associated with design standards must be reviewed whenever there is an opportunity to meet standards, when situations change, or if a MOS is no longer required.

g. An approved MOS cannot be modified. The airport must submit a new MOS if changes are needed.

h. Approval or Disapproval of a MOS Requests at any level:

(1) The FAA documents the reason for disapproval and determination by including it in the comment box in Airports GIS. For disapproval, it must include any recommendations or suggestions to improve the request.

i. An MOS is not applicable for:

(1) Non-standard RSA dimensions.

(2) Non-standard Obstacle Free Zone (OFZ) surfaces.

(3) Non-standard approach / departure surfaces.

(4) To match existing equipment owned by the airport.

(5) Impermissible land use within Runway Protection Zone (RPZ) limits. See AC 150/5300-13 for details.

j. State standards must be prepared in accordance with AC 150/5100-13, *Development of State Standards for Nonprimary Airports*. Once the FAA has approved the use of a State Standard, the standard approved under AC 150/5100-13 may be used for nonprimary airport development without a MOS in the state where the standard was approved. Use of the state standard in states other than where the standard was approved is prohibited.

9. Approval Letters. MOS approval letters must contain the following for each modification:

- A reference to the standard being modified
- Conditions associated with the MOS approval, when necessary
- The effective period of the modification
- A statement that the modification is subject to review at any time if conditions originally justifying the modification changes, or if the FAA deems re-evaluation as being in the public's best interest.

10. Determining the Appropriate FAA Review Authority.

a. Headquarters Office. The Director of Airport Safety and Standards, AAS-1 (or designee), must approve a MOS for the following areas listed below, and as specified in Appendix A.

(1) All MOS for runway to parallel taxiway separations.

(2) Standards for siting navigational or lighting aids.

(3) Standards for marking, lighting, and signs on airport runways, taxiways, taxilanes, and aprons.

(4) Equipment specifications in AC 150/5345-53, *Airport Lighting Equipment Certification Program.*

(5) New, updated, or modified construction methods and material specifications where there is no previous MOS approval.

(6) Quality control or acceptance criteria of materials and finished products.

(a) Quality control criteria, including all performance tests to determine if adjustments are necessary to stay within specification limits. This includes aggregate gradation within tolerance for subbase, base, and surface courses; asphalt content for bituminous mixes; and slump and air content for concrete mixes.

(b) Acceptance testing, including all criteria and performance tests to determine acceptability of the material or finished product, includes: density and thickness for subgrade, sub-base, base courses, and bituminous pavement; flexural strength and thickness for concrete pavement; and surface tolerances for subbase, base, and surface courses.

b. Regional Office. The Regional Airports Division Manager may approve modifications described below and as listed per Appendix A. The Division Manager may choose to delegate the following MOS types to the Airports District Office (ADO) manager:

(1) Modifications of equipment standards (except signs or lighting equipment) on a case-by-case basis when the modification provides an acceptable level of safety and an economically feasible alternative, based on unique local conditions (Note that meeting existing equipment does not constitute a unique local condition.)

(2) Modifications of construction standards having previous AAS-1 approval for use within a region on a case-by-case basis without further review by AAS-1.

(3) Modifications of material standards having previous AAS-1 approval for use within a region on a case-by-case basis without further review by AAS-1.

(4) Modifications based on current Engineering Briefs (EBs).

(5) General Provisions under AC 150/5370-10.

11. **The MOS Process.** For process flow information and diagrams about initiating, viewing, delegating authority, and approving a MOS using Airports GIS, see the Airports GIS online help located at https://airports-gis.faa.gov.

a. Airports District Office Review.

(1) The ADO is responsible for validating and accepting the airport's initiation of the MOS. The ADO is also responsible for reviewing the MOS for accuracy, completeness, and providing their recommendation for approving, disapproving, and coordinating with the region and other lines of business.

(2) An airport's request must include a certification that:

(a) Modifications to materials, construction or equipment standards will provide a product that will meet FAA standards for acceptance and that the finished product will perform for its intended design life, based on historical data.

(b) Modifications to standards will provide an acceptable level of safety.

(c) The modification is necessary to conform to local laws and regulations (if applicable).

(d) Unique local conditions require the MOS.

b. Airports District Office (or Block Grant State) Review. Once the airport has created a MOS, reviewed and electronically signed the MOS, Airports GIS forwards it to the ADO or State Block Grant (SBG) for the appropriate action.

c. Airports Regional Office (RO) Review. The RO (or ADO or SBG if delegated) is responsible for coordinating with regional lines of business. The RO will review the MOS. If required per Appendix A, the RO must forward the MOS electronically along with the Regional recommendation to Headquarters for Headquarters review.

(1) Airspace Review.

(a) Construction or alterations affecting navigable airspace may require an Obstruction Evaluation/Airport Airspace Analysis (OE/AAA) review to fulfill the requirements outlined in 14 CFR Part 77. This may also be coordinated by the ADO.

(b) RO must coordinate modifications that may impact existing or future aircraft operations, instrument flight procedures, navigational aids, or facilities associated with instrument procedures as necessary with Flight Standards, the Air Traffic Organization (ATO) Technical Operations/Engineering Service, the ATO Mission Support Services Aeronautical Navigation Products and appropriate Air Traffic Control Tower (ATCT) where applicable and the Service Center Operations Support Group and Flight Procedures Team.

(c) An aeronautical study in OE/AAA is conducted by the appropriate FAA lines of business before the approval of a MOS. In order to document an airspace or OE/AAA review, the RO/ADO must attach the review and findings to the airport's MOS request in Airports GIS, in a non-editable format such as Portable Document Format (PDF). Include the Nonrule Making Airport (NRA) case number for tracking purposes.

(2) Safety Management System (SMS) / Safety Risk Management (SRM) Review.

(a) The RO must perform an appropriate level of SRM on the MOS request.

(b) A positive SRM result does not automatically mean that a MOS should be approved. Attach SRM documentation to the MOS package in Airports-GIS.

d. Headquarters Office Review. Once the RO reviews the MOS, if necessary per paragraph 10.a, it is then forwarded electronically via Airports GIS to the Headquarters (AAS100) Manager's general delivery mailbox for appropriate action.

12. Documentation.

a. All records pertaining to the MOS, including documents, pictures, and/or approval letters, will be maintained within the Airports GIS MOS Tool.

b. The airport must update the ALP to reflect approved modifications of airport design standards. The airport must include in the ALP a table listing the approved MOS. The table must include the approval letter dates and identify associated airspace review case numbers.

13. The Airports GIS MOS Tool. For process flow information and diagrams about initiating, viewing, delegating authority, and approving a MOS using Airports GIS, see the Airports GIS online help located at https://airports-gis.faa.gov.



John R. Dermody
Director of Airport Safety and Standards

Appendix A

U.S. Department of Transportation
Federal Aviation Administration

MODIFICATIONS OF AIRPORT DESIGN, CONSTRUCTION, AND EQUIPMENT STANDARDS

This table lists MOS categories and subcategories. An "X" in each row indicates whether ARP regions or headquarters can approve each type of MOS or whether a MOS is applicable. This Appendix is not all inclusive, and is subject to the discretion of the Director of Airport Safety and Standards based on specific details in a MOS submittal.

Category	Sub Category	ARP Region	ARP HQ	MOS Not Applicable
Airport Equipment Standards	Painting Marking and Lighting of Vehicles on the AOA		X	
Airport Equipment Standards	Design Specifications for Snow Removal, Aircraft Rescue & Fire Fighting and other equipment.		X	
Airport Equipment Standards	Installation and Acceptance Standards for Snow Temperature Sensors, Foreign Object Detection and other equipment		X	
Airport Equipment Standards	Operational/Performance Standards for Snow Removal and Aircraft Rescue & Fire Fighting equipment		X	
Airport Equipment Standards	Other		X	
ATC Facility	Automated Weather Systems - Automated Weather Observing System (AWOS)/ Automated Surface Observing System(ASOS)		X	
ATC Facility	Runway Visual Range		X	
Design	Blast Pad Dimensions	X		
Design	Clearway			X
Design	Declared Distances			X
Design	End Around Taxiway (EAT)		X	
Design	Full Length Parallel Taxiway	X		
Design	Horizontal Geometry - Taxiway Curves and Intersections, including 180 degree turns	X		

Category	Sub Category	ARP Region	ARP HQ	MOS Not Applicable
Design	New Instrument Approaches – Waivers to TERPS		X	
Design	Obstacle Free Zone (OFZ) - TERPS Waivers Related		X	
Design	Runway End Siting Requirements			X
Design	Runway Hold Positions - Marking		X	
Design	Runway Hold Positions - Offset Distance		X	
Design	Runway Object Free Area (ROFA)	X		
Design	Runway or Taxiway Width	X		
Design	Runway Protection Zone (RPZ)			X
Design	Runway to Heliport Separation		X	
Design	Airplane Design Group VI Standards		X	
Design	Runway to Taxilane Separation		X	
Design	Runway to Taxiway Separation		X	
Design	Runway Visibility Zone	X		
Design	Surface Gradient and Line of Sight	X		
Design	Taxilane to Parallel Taxilane	X		
Design	Taxiway Edge Safety Margin	X		
Design	Taxiway Object Free Area (TOFA)	X		
Design	Taxiway Safety Area (TSA)	X		
Design	Taxiway to Object Separation	X		
Design	Taxiway to Taxiway/Taxilane Separation	X		
Design	Taxiway/Taxilane Wingtip Clearance	X		
Design	Treatment of Jet Blast	X		
Design	Other		X	
Lighting	Configuration - Aiming/Beam Spread		X	
Lighting	Configuration - Color		X	
Lighting	Location		X	
Lighting	Configuration - Flash Rate		X	

Category	Sub Category	ARP Region	ARP HQ	MOS Not Applicable
Lighting	Configuration - Intensity		X	
Lighting	Control and Monitoring		X	
Lighting	Fixture Hardware		X	
Lighting	Installation		X	
Lighting	Interconnecting Hardware		X	
Lighting	Power Source		X	
Lighting	Other		X	
Markings	Configuration - Color		X	
Markings	Location		X	
Markings	Materials		X	
Markings	Other		X	
NAVAIDS	Approach Light Systems		X	
NAVAIDS	Non-NAS Change Proposal's (NCP's) NAVAID Does Not Meet Runway (VFR/IFR) OFZ Standards		X	
NAVAIDS	Non-NCP's NAVAID Requires Exception on a CAT II or III Runway		X	
NAVAIDS	Non-NCP's NAVAID that Requires TERPS Waiver		X	
NAVAIDS	Siting Criteria		X	
NAVAIDS	Other		X	
Methods & Materials	General Provisions	X		
Methods & Materials	Earthwork, P-100s	X		
Methods & Materials	Flexible Base Course, P-200s		X	
Methods & Materials	Rigid Base Course, P-300s		X	
Methods & Materials	Flexible Surface Course, P-400s		X	
Methods & Materials	Rigid Pavement, P-501		X	
Methods & Materials	Miscellaneous, P-600s		X	

Category	Sub Category	ARP Region	ARP HQ	MOS Not Applicable
Methods & Materials	Fencing, F-100s	X		
Methods & Material	Drainage, D-700s	X		
Methods & Materials	Turf, T-900s	X		
Methods & Materials	Lighting, L-100s		X	
Methods & Materials	Other		X	
Signage	Control and Monitoring		X	
Signage	Dimension		X	
Signage	Fixture Hardware		X	
Signage	Interconnecting Hardware		X	
Signage	Legend - Color		X	
Signage	Legend - Wording		X	
Signage	Location		X	
Signage	Power Source		X	
Signage	Other		X	
Visual Aids	Centerline/Edge		X	
Visual Aids	Land and Hold Short Lighting		X	
Visual Aids	Radio Control		X	
Visual Aids	Runway/Taxiway		X	
Visual Aids	SMGCS		X	
Visual Aids	Visual Guidance Slope Indicator (VGSI) for IFR and VFR Runways		X	
Visual Aids	Airport Beacon		X	
Visual Aids	Wind Cones		X	
Visual Aids	Runway Status Lights		X	
Visual Aids	Obstruction Lights		X	
Visual Aids	Other		X	

Aurora Airport Resiliency Plan

Prepared by:

Aurora Airport Improvement Association
14497 Keil Road
Aurora, Oregon 97002

June 18, 2021 updated 8/30/2024

- *"Resiliency to disasters means a locale can withstand an extreme natural event with a tolerable level of losses."* Dennis S. Mileti, *Disasters by Design*, American Academy of Sciences Report, 1999.

Resiliency Plan Introduction

This Aurora Airport Resiliency Plan provides detailed description and background concerning the enormous assets that the Aurora Airport and immediate surrounding properties can or will be providing to Marion County, the State of Oregon, and the NW region following any major environmental disaster. This is especially true for "the big one" – the Cascadia Event earthquake.

When other primary transportation modes – roads and rail lines – are disrupted by landslides, broken pavement, and unusable bridges, it will be air transportation that is essential in the delivery of supplies, and medical help. During those times air transportation will also provide the transportation for workers equipment to repair bridges, major power lines, gas pipe lines, and other basic infrastructure. Thus, as will be explained in this plan, the Aurora Airport will play a major role in the recovery of the north Marion County area, as well as parts of southwestern Clackamas and Multnomah Counties. Aurora Airport may turn out to be the closest operational airport even to large parts of the City of Portland. It will become one of the primary logistical hubs to support response and recovery periods that follow an event.

Much attention is given to the possibility of an 8.0-9.0 magnitude Cascadia Subduction Zone (CSZ) earthquake occurring in the Pacific Northwest, along the CSZ fault line, which stretches from southern British Columbia to northern California. History has shown, and scientists confirm, this quake occurs, on average, once every 200 to 500 years. The last major CSZ earthquake and tsunami occurred in 1700. Geologists say that most of the intervals between these events have been less than the 310 years since the last one. So it is not a matter of if, but of when.

The danger of these large CSZ earthquakes has been known for some time, but it is only recently that citizens are taking it seriously. Probably the most important document that changed

people's thinking on this was the 2015 New Yorker article titled The Really Big One[1] by Kathryn Schulz. In that article, the director of FEMA's Region X (the division responsible for Oregon), is quoted as saying:

"Our operating assumption is that everything west of Interstate 5 will be toast."

That shocking statement got the Oregon public's attention in a big way. The public interest generated support for the Governors and Legislatures in Oregon, Washington, British Columbia, and California to begin major disaster planning for this CSZ event in earnest.

Aurora Airport is just a little east of Interstate 5, so by FEMA's view, does that mean it won't be "toast?" Of course not; but there are a whole bunch of reasons why Aurora Airport is expected to not only survive the event, but will likely actually remain operational.

Equally important to the Willamette Valley region, Aurora Aiport will be a particularly important airport to provide disaster services for the region, following "the really big one," due to the major aviation and infrastructure services it provides on a day-to-day basis. These will be essential services after the seismic event. This paper describes the detail of those essential services, and establishes next steps for making the Aurora Airport even more resilient as a lifesaving tour de force for the Willamette Valley region, following the seismic event.

[1] https://www.newyorker.com/magazine/2015/07/20/the-really-big-one

1.0 Existing Airport Infrastructure and Its Basic Resilience

- *"Sustainability means that a locality can tolerate – and overcome – damage, diminished productivity, and reduced quality of life from an extreme event without significant outside assistance,"* Dennis S. Mileti, *Disasters by Design*, American Academy of Sciences Report, 1999.

1.01 War Effort Federally Funded Original Heavy-duty Infrastructure

Aurora Airport was constructed in 1943, during World War II by the United States Army Air Forces. At that point in the war the outcome was still in serious question. Just a year prior, a Japanese submarine along the south Oregon coast had launched a floatplane that had dropped incendiary bombs inland, trying to start major forest fires. Another Japanese submarine had fired shells at Fort Stevens near Astoria. It was recognized by the Federal government that there was an essential need to be able to patrol and defend the West Coast with military aircraft from numerous locations in western Oregon. Aurora Airport was constructed and during its initial period was used for patrolling the coast, looking for enemy ships and aircraft, and for pilot training.

Aurora Airport from its beginning, represents a major investment of public tax dollars, to create essential public infrastructure. As a military airport, Aurora Airport was designed, and construction specified, using the standard military criteria of that era. It was established as a 150 foot wide by 4,104 foot long runway. The asphalt pavement was built upon a very thick, heavy gravel base, designed to accommodate the loads of military aircraft. This included the ability to handle medium and heavy bombers such as B-25, B-26, B-17, B-24 and cargo aircraft such as C-45, C46, and C-54.

1.02 Federal Aviation Trust Fund Continued with Solid Infrastructure Improvements

Following the war, Aurora Airport was managed by the United States Bureau of Public Roads. In 1953 the State of Oregon Highways Division then became the operator of the Airport. In 1973 ownership was transferred to the Aeronautics Division. From this point forward most funding has come from the Federal Aviation Administration (FAA) through their Aviation Trust Fund that is created from taxes on aviation fuel. The first FAA Airport Master Plan was prepared in 1976, followed by major improvements in 1977-78, which included construction of a parallel taxiway, installation of a rotating beacon, runway reconstruction and a narrowing of it from 150 feet to 100 feet, runway lighting, and tiedown apron construction.

The1976 Plan identified the need for an air traffic control tower and a runway extension to a full 6,000 feet. In 1995, the runway was lengthened from 4,104 feet to 5,004 feet, and the FAA installed (and to this day maintains) a non-precision Localizer Landing System instrument for Runway 17. In 2001 the Aurora Airport Water Control District was formed to create a fire protection water system for the airport. The water district put in water storage tanks, a pump

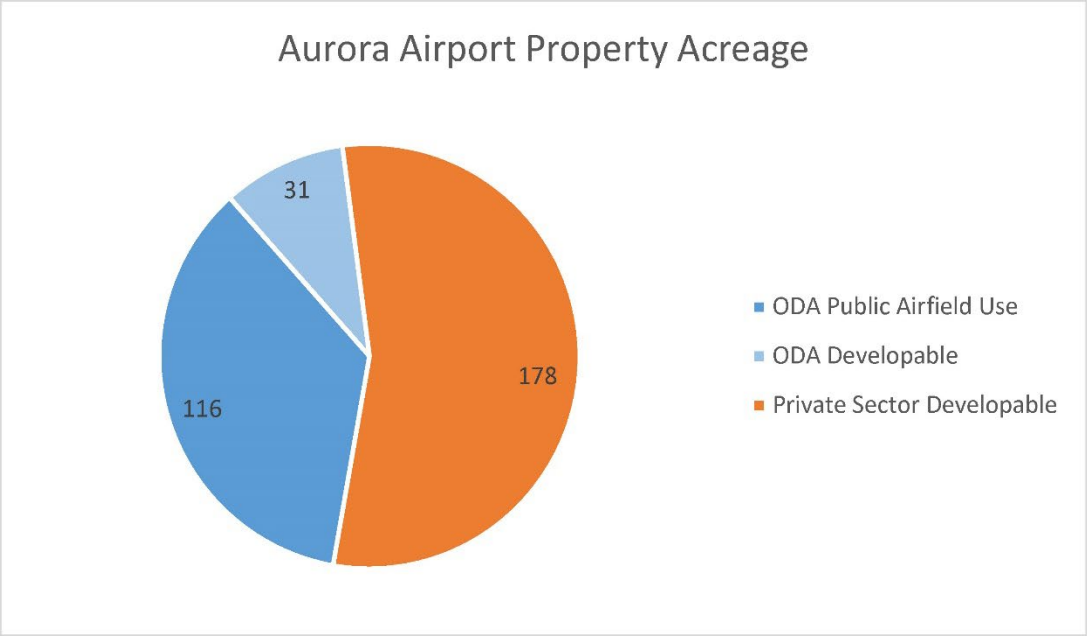
house, and a fire hydrant system that serves the developable lands of the airport. The same system provides water for fire sprinklers in the hangars, as required by the state fire marshal.

In 2004, the runway was reconstructed and in 2009, the parallel taxiway was relocated to meet FAA's design standard for runway-taxiway centerline separation. The 2012 Airport Master Plan Update confirmed the need for construction of a control tower and extension of the runway to the planned 6,000 feet as had previous updates called for. In 2015 a control tower was constructed and became operational. The runway extension is scheduled to have its environmental assessment study performed in 2022 and construction to occur in the following two years.

Virtually all of these airport improvements continue to be funded mostly with federal funds that come from a tax on aviation fuel. Thus, the airport improvements costs do not take any funds from schools, social programs, or other general fund tax sources. They are entirely funded by funds created by the aviation industry itself – thus a tax on itself.

1.03 Resiliency from a Unique Public-Private Partnership

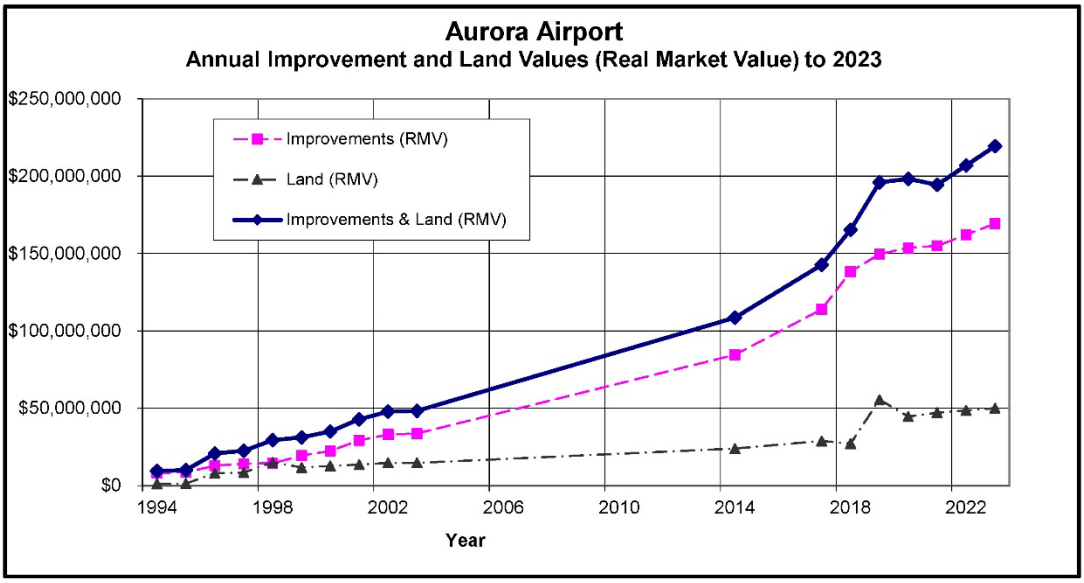
Aurora Airport has a unique resiliency, in that more than half of its land is privately owned and thus functions as a unique public-private partnership. Of the overall approximately 325 acres of airport-use property, the State of Oregon owns 45% (147 acres) and private sector owns 55% (178 acres). Of the state's 147 acres approximately 116 acres are for aircraft operations areas of runway, taxiway, and clear zones, while 31 acres are developable for aircraft tiedowns and hangars. The pie chart below shows this graphically.



The total area available for development of aircraft tie-downs, hangars, internal taxilanes, internal vehicular roads, parking, and other uses is approximately 154 acres, of which 20% (31 acres) is on public land and 80% (123 acres[2]) is on private land.

The availability of private land with access to a public airport creates a great benefit for the creation of aviation-related jobs for a community. This is because the business community can invest in buildings and equipment on private land though normal financing methods that are not available on leased land. In 2005, the Oregon Legislature recognized the unique ability of airports to create jobs in a community, and named Aurora Airport as one of three airports in Senate Bill 680, which encouraged this type of community partnership between the public and private sectors.

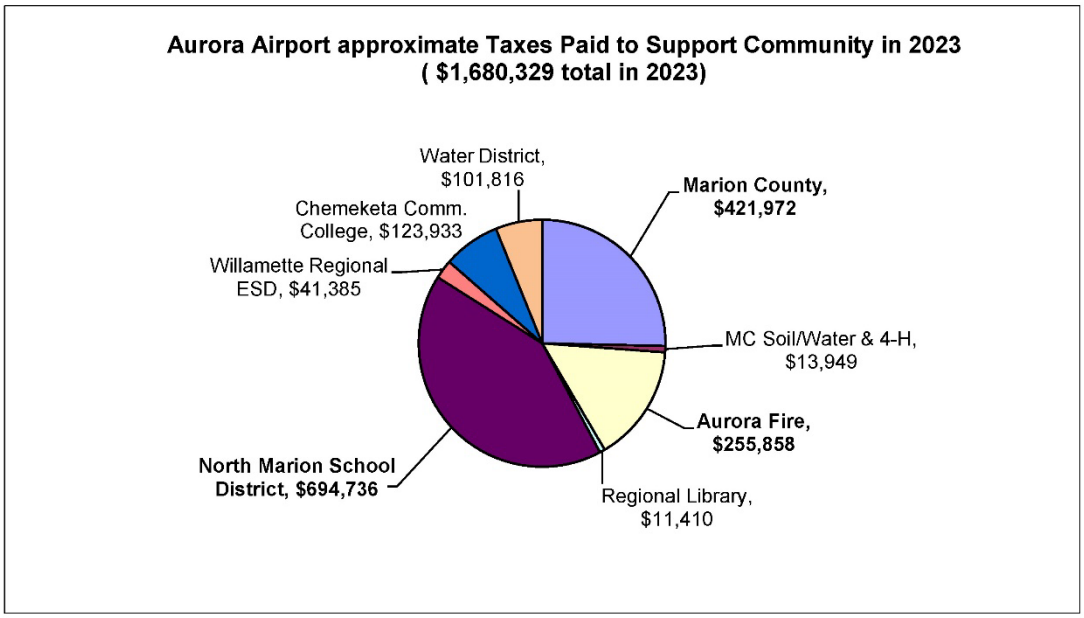
Aurora Airport is the model airport for this kind of economic development effort that is possible. Marion County tax records show that businesses at Aurora Airport now have an investment of approximately $216 million in facilities.[3]



These facilities not only provide airport services essential for the aviation industry. They also provide a return to the community in the form of jobs and taxes. Tax records show that the airport development property tax base provides an annual payment of over $1.68 million in per year to local schools, police, fire, and county government agencies. Next year this will undoubtedly rise even further.

[2] Note that a portion of the "developable" public and private properties facing the runway or runway approaches has some restrictions to development due to required airspace clearances and/or are usable only for aircraft tiedown and cannot have buildings.

[3] Note this value does not include the development costs of the runway and taxiway, or of internal public roads which if constructed from scratch likely have a construction value of at least $100,000,000.



Equally import, the approximately 1,000+ highly skilled mechanics, pilots, medics, aircraft designers, and aviation-related innovators who are employed by the aviation businesses at the airport, provide an income tax base that further supports all state and local government services.

The public-private partnership is an important component of the resiliency of Aurora Airport, because it shows the strong economic connection between the airport and the community, in providing jobs and tax support. It means that following a natural disaster, the human component of the airport will be ready and able to carry on the important work of disaster recovery. The importance of public-private partnerships in disaster recovery is well documented in the paper: *Achieving Resilience in Disaster Management: The Role of Public-Private Partnerships*.[4]

As will be seen in a following section of this report, the aviation businesses who chose to invest and grow at the airport, are ones that by their nature are important to providing the services needed during a seismic event or other natural disaster. These businesses are here to stay, because they are owners of their facilities. They are part of the community.

1.04 Resiliency provided by the Soils Underlying the Airport

Three recent detailed geotechnical studies on the soils around the Aurora Airport, show that the soils are not prone to significant liquefaction during an earthquake. Each of these studies were

[4] Nathan E. Busch and Austen D. Givens, *Achieving Resilience in Disaster Management: The Role of Public-Private Parnerships*, Journal of Strategic Security, Volume 6 Number 2, 2013. https://scholarcommons.usf.edu/cgi/viewcontent.cgi?article=1231&context=jss

performed by drilling approximately 100 feet down and studying the soil profiles. In each case a second cone penetration test was performed to approximately 100 feet deep. These studies established that:

> *"Our analysis indicates that total post-liquefaction settlement at the existing ground surface will be negligible during a design-level earthquake."*

This means that it is highly likely that the pavement of the runway, taxiways, aircraft aprons, and vehicular roads will be fully functional after an earthquake. For the airport buildings, which have heavy loads on their footings, the reports predict an approximate one-half inch of differential settlement. This is a remarkably small amount of settlement, and indicates that for buildings designed using current structural codes, they too will likely be fully functional following an earthquake.

1.05 Resiliency based on demonstrated Runway Load Capacity

The Aurora Airport runway was originally constructed as a military airport, with a strong rock base. The rock base forms the essential backbone for the runway, and military planners know this. Thus, they start with an exceptional rock base design, knowing that the pavement can always be repaired, added to, and otherwise improved, but the base cannot easily be redone.

From the above geotechnical information, we know that the underlying soil also has a remarkable stability. In 2019, a geotechnical study using falling weight deflectometer (FWD) testing, core explorations, and engineering analyses was conducted in accordance with FAA Advisory Circular 150/5335-5C, *Standardized Method of Reporting Airport Pavement Strength – PCN*. Using that FAA methodology, it determined that the runway is capable of being regularly used with single wheel main gear loads of 102,000 pounds or dual wheel main gear loads of 145,000 pounds.

Since the runway was originally designed to military standards, this should be expected. It indicates that during disaster recovery work, typical medium weight military cargo aircraft that meet these weight limitations can use the runway.

1.06 Resiliency based on available Control Tower

Good communications systems are essential during disaster recovery periods. The FAA Control Tower was installed in 2015 ensures that Aurora Airport has a direct linkage to the larger FAA airspace control system, in addition to the normal ability to use aviation frequencies to communicate with aircraft in the air approaching the airport, and on the ground for coordination during taxiing operations. The control tower does have an emergency generator system, so can remain functional during power outages.

1.07 Resiliency based on access to I-5

Aurora Airport is located a 3 minute drive from the I-5 Exit 278 ramp. Thus, the airport is strategically located to coordinate with vehicular traffic once I-5 is operational following a regional disaster.

1.08 Resiliency lacking for Runway Lights and Electrical Service

Aurora Airport has a medium intensity runway and taxiway lighting system, an airport rotating beacon, and includes an Omni-Directional Approach Lighting (ODAL) system for instrument approaches to Runway 17. These are appropriate for an airport that that is intended to provide resiliency services following a major earthquake event. However, none of these lighting systems have emergency generator power, which will need to be remedied in future resiliency upgrades. It is noted than the FAA Localizer for Runway 17 also does not have emergency power.

The service provider to Aurora Airport is PGE. AIAA is working with PGE and has determined power lines feed the airport come from multiple directions, which can be important when power is disrupted as with addition of appropriate power line switches it can allow power availability from one direction to Aurora Airport while the other direction is out of service. AAIA is currently exploring resiliency methodologies of backup power for parts, if not all of the airport. These include, but are not limited to, solar, fossil fueled generation, and battery backup systems.

1.09 Resiliency lacking for Building and Facilities Electrical Service

The existing buildings, hangars, fuel systems, and other facilities at the airport do not have emergency generators. AAIA is developing a plan for having all airport buildings provided with manual transfer switches and standardized plugs to be added to each building. This will make all buildings have the capability of connecting to a mobile generator or adding a generator during/after an event It is important to realize some buildings may be re-purposed and thus for some things an empty building is more valuable than a full one. Several owners of significant hangars on the airport have indicated their willingness to share space for aviation operations and logistical support.

As a phase two of this work, the AAIA is considering acquiring and maintaining a collection of generators that can be used at particular buildings on an as-needed basis. A plan will be developed for how to quickly bring in additional generators from other parts of the country, so that all facilities have emergency power capability.

1.10 Summary of Existing Infrastructure Resiliency

The exceptional resiliency of the existing Aurora Airport infrastructure comes first from its excellent soils and from its origin as a military airport from World War II era. The airport has continued to have major upgrades of an initial 1,000 foot runway extension, along with a well-constructed parallel taxiway, lights, and an FAA control tower, all funded largely by FAA grants from the dedicated airport trust fund. A future 1,000-foot runway extension is approved by the

state and FAA per the 2012 Master Plan and is awaiting final environmental review and construction – both expected to be completed in the next three to five years.

The airport is a mixture of public and privately owned lands. This has promoted major investment in aviation facilities at the airport, which has resulted in major aviation service, maintenance, and repair capabilities being available. As a community resource, the airport also provides important tax base for public schools and government agencies. As such, it has a particularly strong positive relationship with the larger community, and is an important partner.

The runway has good strength for cargo and other aircraft that would need to use the airport as part of disaster recovery efforts. Geotechnical studies show that the airport is likely to be fully functional following a major earthquake, as there will be negligible settlement due to liquefaction. The one major weakness of the existing infrastructure is that only the control tower has emergency generator power. Future resiliency upgrade plans should focus on adding emergency power to the airfield lights and localizer. Plans for developing emergency power capability for the fuel systems and buildings at the airport, is also part of the planning effort for improved Aurora Airport sustainability.

2.0 The Airport Businesses that will help in Regional Recovery and their Capabilities and Resources

- *Building and maintaining partnerships is one of the primary strategies FEMA identifies for implementing the Whole Community Framework. Partnerships that include the public and private sectors have the potential to enhance the efficiency and effectiveness of efforts undertaken by individual firms and public agencies. Working together, partners can advance new efforts that build on the unique knowledge and capabilities present among actors from the public and private sectors.* Southeast Disaster Recovery Partnership & NOAA, *For the Long Haul: Public-Private Partnerships for Long-Term Disaster Recovery, 2018*.

2.01 Introduction

The Aurora Airport public-private partnership has created a setting where major aviation-related business can own their land and facilities, which allows them to make much bigger investments in their facility needs, than can occur on leased land. This is because in lieu of the investment value going to zero as the end of the 10, 20, or 30 year lease period ends, the value of the property and development increases over time. This also promotes a business to keep maintaining and investing in upgrades to its facilities, keeping it at the cutting edge of innovation and competitiveness on the world market.

2.02 Heavy Lift Helicopters & Roles in Disaster

Aurora Airport is a major headquarters and base of operations for the three largest heavy lift helicopter companies in the United States: Columbia Helicopters, Helicopter Transport Services (HTS), and Erickson. For Columbia and HTS these are the world headquarters, and their helicopters provide services to every continent of the world. These three companies will be providing essential supply transportation services following a major seismic event. Since their maintenance facilities are at the airport – Aurora Airport will remain their base of operations. This will provide essential sustainability to the Willamette Valley regions that are around the airport.

2.03 Medivac & Role in Disaster

Aurora Airport is the national headquarters for Life Flight Network, the principal emergency air medical service for the northwest United States region. Their service area includes Oregon and large parts of Washington, Idaho, and Montana. Their services will be critical to citizens of Marion County, Oregon and the region. Life Flight Network operates both helicopter and fixed wing aircraft, enabling them to support short, off airport missions as well as transportation of stabilized, but critical, patients out of the immediately affected event area.

2.04 Power Line Restoration & Role in Disaster

Aurora Airport is the base of operations for two companies that specialize in repair and modifications of major electrical grid power lines using helicopters: Wilson Construction Company and Winco Power Line Services Inc. In repairing downed and damaged power lines, following a natural disaster – whether it be fire or windstorm or earthquake - these service will be critical to the citizens of Marion County, Oregon and the region. These companies have well developed and active relationships with the heavy lift helicopter operators at Aurora Airport to work together in restoring power. This will be absolutely critical because, as evidenced by the recent ice storm, road access to works may become impassable.

2.05 Aerial Mapping and Data Collection & Role in Disaster

Aurora Airport is a base of operations for Oregon's premier aerial mapping company: Geo Terra, Inc. Their aircraft and equipment will be essential in providing high resolution aerial photography and mapping of regional infrastructure for the basic planning for recovery following a disaster. Also based at Aurora Airport is FLIR systems flight department. FLIR is the premier manufacturer of high-capacity infrared camera systems. Their fleet of aircraft are mounted with state of the art cameras that are used to locate existing infrastructure as well as identify problems after an event, to include the location of people in distress.

2.06 Fixed Base Operations for Aircraft Fuel and Service

Aurora Airport has two Fixed Base Operators (FBOs): Lynx and Willamette Aviation. These and others of the aircraft operations at the airport have a total fuel capacity of over 250,000 gallons in a combination of fixed tanks and mobile truck tankers. In addition, each FBO has a designated place for temporary fuel bladder tanks to be stored when brought in by heavy lift helicopters from Redmond Airport (as disaster planners are projecting), or other non-affected locations. The ground handling capabilities of these businesses will become critical immediately following an event as military and civil aircraft arrive to support. Their leadership is open and ready to coordinate with civil and military authorities.

2.07 Major Aircraft Maintenance Facilities

Aurora Airport has numerous businesses with major aircraft maintenance facilities. These facilities and their many FAA licensed mechanics and inspectors that have capability to repair all kinds of aircraft. They have ready to use test equipment, can rebuild engines and machinery, have spare parts inventory, have tools, and the skilled labor force necessary to maintain their aircraft. They also have repair and maintenance capability for specialty aviation accessories like aero-medical equipment, aerial photographic equipment. These businesses will be able to maintain – without help from outside – their equipment a full functional condition during a seismic emergency. That is the definition of "sustainability." The expertise of these businesses

means that they also will be available if needed by the military to assist in maintenance of their aircraft that are involved with the recovery efforts.

2.08 Availability of Specialty Manufacturing

Aurora Airport is the international headquarters of Vans Aircraft, the largest supplier of kit-built aircraft in the world today. Their facilities include computer aided design metal-cutting machines and large supplies of aluminum sheet. Should a recovery effort need the quick manufacturing of specialized aluminum devices, the Vans Aircraft machines can quickly be re-purposed and programmed to mass produce specialty devices, on an as-needed basis.

2.09 Availability of Large Spaces for as-needed Special Recovery Efforts

Aurora Airport has approximately 1,250,000 square feet of buildings. Of this approximately 70% is hangar space, and 30% is office/shop space. The size of buildings varies from long-span 200 foot wide with 28 foot high hangar doors on 160 foot deep space, to small 60 foot by 60 foot hangar units, to multi-story offices. These spaces are devoted to their prime use as aviation-related support facilities. However, if during a disaster event, regionally the need is for storage of essential products or equipment, some of these wide-open spaces can easily be repurposed for other uses – whether they be medical, or area planning, or communications. They can be quickly transitioned to highest and best use for emergency management operations.

Most emergency and military planners look for these combinations of operating airports, hangars and large vacant land next to a water source to plan the placement of temporary recovery assets. Aurora Airport is uniquely suited as it is proximate to the Metro area and will be intact and able to support in case of an event in addition to meeting these planning and placement criteria. This will be covered in more depth in section 3.0.

2.10 Availability of Equipment

These many essential businesses, also maintain an inventory of tools, lifts, ladders, and every type of equipment that will otherwise be difficult to obtain in an emergency. This provides resiliency to the operations of all of the combined businesses at the airport.

2.11 Conclusion

Aurora Airport has numerous businesses that will be essential for the region's recovery. This ranges from providing heavy lift cargo deliveries, to medical transport, to aircraft maintenance, to the mundane fuel and servicing of aircraft. These are essential ingredients to a sustainable region around the airport.

3.0 The Agricultural Land Surrounding the Airport and its Availability for Staging

Aurora Airport is surrounded by agricultural lands. Many of these lands are set up with large gravel pavement areas for the production, storage, and shipping of agricultural products. During an emergency these areas can be repurposed as staging areas for use by emergency management operations.

Immediately adjacent to the airport is zoned farmland to the east, north, west, and south. The farmland to the immediate east is clear and flat, lending itself to the natural placement of emergency medical facilities as well as logistical support and storage. The land is irrigated by pumped well water. The Pudding River flows parallel to the airport runway approximately 1 mile to the east.



Both of these geographic features and the wells will become extremely valuable during an event recovery as they can, and most likely, will be used for emergency medical facilities, logistical laydown, and storage/distribution of supplies. The military (specifically, the Oregon Army National Guard) operates water purification equipment with the ability to pull water from the

Pudding and/or from the wells, to purify and store significant quantities to support emergency needs in temporary emergency medical facilities. Water can also be made available to support and supplement surrounding communities.

AAIA is in the process of meeting with some of these surrounding farm operations. The goal is to have some pre-agreements for use of those facilities during a major earthquake or other natural disaster.

4.0 The Airport Current Status in County and State Preparedness Plans

The following emergency management and planning documents already acknowledge the important of Aurora Airport as part of preparedness plans:

- FSA Tier 2 (2017 Airport Resiliency Workgroup),
- Category 2 (Oregon Resilience Plan 2013),
- "Critical Transportation Facility" (Marion County Multi-Jurisdictional Hazard Mitigation Plan 2017),
- Type 2 FSA (Oregon Aviation Plan 2019), "National Airport" (FAA designation, only two in Oregon).

5.0 The Airport Future Role in County and State Preparedness Plans

Aurora Airport will be capable of providing unique, essential, major recovery assistance following a major natural disaster. The businesses in the airport specialize in disaster cargo, power line repair, aerial disaster mapping, and emergency medical treatment. The existing county and state preparedness plans do not yet acknowledge or appear to understand the essential resilience of Aurora Airport for self-contained operations during a disaster. Nor does it yet recognize the importance of the airport services to maintaining the resiliency of the Willamette Valley region. It is recommended that Aurora Airport be better integrated into state, regional, and county plans for recovery efforts.

Some local cities have expressed interest in coordinating with and supporting the resiliency of Aurora Airport. AAIA is in discussion with the cities of Woodburn and Canby in coordinating joint resiliency efforts.

6.0 Current User Planning for Improvements to Airport Resiliency

The following resiliency improvements to Aurora Airport are currently being pursued by AAIA:

- Coordination with Marion County to further the resiliency of Aurora Airport and North Marion County;
- Coordination with local cities expressing interest in supporting the resiliency of Aurora Airport and their local communities, including: the City of Woodburn and City of Canby.
- Addition of manual power transfer switches to most airport buildings and fuel facilities, all with a common plug when possible;
- Acquisition of generators to be available for use at the airport buildings and fuel facilities;
- Meetings with surrounding agricultural properties to pre-plan for potential shared use during a disaster; and
- Potential creation of a joint-use Fire Station/Emergency Operations Center/Airport Management building as part of the development of the Aurora Airport Business Center property.

7.0 Aurora Airport Resiliency and the Goals of the Aurora Airport Improvement Association (AAIA)

The AAIA is fully committed to improving the resilience of Aurora Airport. It recognizes that the airport is unique, and will play a major role in the resilience of the north Willamette Valley area. In fact, due to the unique nature of the heavy lift, power line, and emergency medical resources, it may play a major role to the recovery of the state. AAIA welcomes input on improving this resiliency plan, and looks forward to working cooperatively with our Marion County leaders, and our local communities.

AAIA's Aurora Airport resiliency plan focusses on:

- Promoting local responsibility by the airport businesses for creating the airport resiliency plan;
- Promoting a vibrant economy as part of the resiliency plan, so that the airport businesses provide jobs and tax base for schools and other essential services as part of their development;
- Using the airport's key unique state-of-the-art, innovative businesses as essential elements of the plan; and
- Working with Marion County and local communities to have a win-win for resiliency at the airport and at their communities.

BEFORE THE BOARD OF COMMISSIONERS -- *DRAFT*--

FOR MARION COUNTY, OREGON

RESOLUTION No.

In the Matter of Declaring)
that Aurora Airport shall be)
considered a key Resiliency)
Airport for use during a)
major seismic event.)

This matter is before the Board of Commissioners, as an essential emergency management infrastructure issue, to acknowledge the importance of Aurora Airport in providing services and support to the residents of Marion County following a major seismic event.

WHERAS, recently completed soils reports at the airport predict a negligible soil settlement following the largest predicted earthquake, which indicates that the runway, taxiways, and parking aprons will likely be fully operational with very little repair, following a major seismic event; and

WHEREAS, the airport is a major headquarters and base of operations for the three largest heavy lift helicopter companies in the United States, Columbia Helicopters, Helicopter Transport Services, and Erickson, and these helicopters will provide essential supply transportation services following a major seismic event; and

WHEREAS, the airport is the regional headquarters for Life Flight Network, the principal emergency air medical service for the northwest United States region that includes Oregon and large parts of Washington, Idaho, and Montana, and whose services will be critical to citizens of Marion County, Oregon and the region; and

WHEREAS, the airport is the base of operations for two companies that specialize in repair and adjustments of major electrical grid power lines, Wilson Construction and Winco Inc., and whose services will be critical to the citizens of Marion County, Oregon and the region; and

WHEREAS, these resiliency critical businesses all have major aircraft maintenance facilities at the airport, for their specialized aircraft, with ready to use test equipment, rebuild machines, spare parts inventory, tools, and the skilled labor

force necessary to maintain their aircraft, specialty aviation accessories, and aero-medical equipment in a full functional condition during a seismic emergency;

WHEREAS, the airport is surrounded by agricultural lands that during an emergency can be repurposed as staging areas for use by emergency management operations; and

WHEREAS, the airport has two Fixed Base Operators serving aircraft and the airport as a whole has fixed and truck-mounted tankage for up to 250,000 gallons Jet fuel and avgas, along with site locations for temporary fuel tanks to be stored when brought in by said heavy lift helicopters; and

WHEREAS, the airport runway was constructed as a military airport, funded by the U.S. government, with capability of landing heavier military type aircraft, and by independent testing has been found to currently be capable of supporting aircraft with up to 102 thousand pound single wheel main gear or 145 thousand pound dual wheel main gear loads; and

WHEREAS, the airport has approximately 1,250,000 square feet of aviation hangar, office, and shop space that can be quickly transitioned to highest and best use for emergency management operations; and

WHEREAS, there is current planning underway to have each airport building be retrofitted with a manual power transfer switch that will allow each to function with power from an emergency electrical generator if electrical power is lost; and

WHEREAS, the following emergency management and planning documents already acknowledge the important of the airport as: FSA Tier 2 (2017 Airport Resiliency Workgroup), Category 2 (Oregon Resilience Plan 2013), “Critical Transportation Facility” (Marion County Multi-Jurisdictional Hazard Mitigation Plan 2017), Type 2 FSA (Oregon Aviation Plan 2019), “National Airport” (FAA designation, only two in Oregon); and

WHEREAS, the airport has the support of the following Marion County cities for being considered an essential resiliency airport: [working on letters from Woodburn and Canby], now, therefore

IT IS HEREBY ORDERED that the Aurora Airport shall heretofore be designated by Marion County as a Tier 1 resiliency airport for purposes of planning for emergency services during periods of county-wide disaster.

IT IS HEREBY ORDERED that the Marion County Public Works/Emergency Management assist the Aurora Airport by supporting grant applications that further prepare the airport infrastructure to serve its important function of being a resiliency airport to resupply and support the citizens of Marion County during periods of disaster following a severe seismic event or other county-wide disaster.

DATED at Salem, Oregon, this ___ day of ___, 202_.

Chapter 17.171
P (PUBLIC) ZONE

Sections:

17.171.010 Purpose.

17.171.020 Uses.

17.171.030 Conditional uses.

17.171.040 Scale of commercial uses.

17.171.050 Prohibited and lawfully established existing uses.

17.171.060 Property development standards.

17.171.010 Purpose.

The purpose and intent of the P (public) zone is to provide regulations governing the development of lands appropriate for specific public and semi-public uses and to ensure their compatibility with adjacent uses. It is intended that this zone be applied to individual parcels shown to be an appropriate location for a certain public or semi-public use. If the use existing at the time the P zone is applied is discontinued or if a proposed use is not established, it is the intent that the land be rezoned to conform to surrounding zoning or be devoted to permitted uses. It is not intended that a property zoned public for one type of use be allowed to change without demonstrating that the proposed conditional use will be compatible with adjacent uses and the property is better suited to the proposed use than alternative locations. [Ord. 1271 § 5, 2008; Ord. 1227 § 4, 2006; Ord. 1191 § 4, 2004; Ord. 1139 § 5, 2001; Ord. 1131 § 5, 2000; Ord. 1118 § 5, 2000; Ord. 1055 § 4, 1997; Ord. 579 § 5, 1980. RZ Ord. § 171.010.]

17.171.020 Uses.

Within any P (public) zone, no building, structure or premises shall be used, arranged, or designed to be used, erected, structurally altered or enlarged except for the following purposes:

A. Farm use, but not including a medical marijuana processor (see MCC 17.110.376), medical marijuana producer (see MCC 17.110.378), or a medical marijuana dispensary (see MCC 17.110.374);

B. Forest use;

C. Dwellings (including mobile homes) and other structures customarily provided in conjunction with farm or forest use subject to the criteria in MCC 17.139.030;

D. Utility facilities necessary for public service except public power generation;

E. Wireless communications facilities, including attached, subject to the following development standards:

1. Notwithstanding other height limitations in this title omni-directional (whip) antennas not exceeding 20 feet in height and directional/parabolic antennas not exceeding seven feet in diameter or width and 15 feet in height may be attached to or located on existing structures;

2. Antennas and associated equipment shall be surfaced in a nonreflective color to match the structure on which they are located. An equipment enclosure may be set back from the edge of a roof by a distance at least equal to its height in lieu of screening;

3. Equipment enclosures shall be located within the building on which they are located wherever possible; otherwise, equipment enclosures shall be fenced by a six-foot-high fence, wall or hedge;

4. Antennas shall not be illuminated except as required by the Oregon State Aeronautics Division or the Federal Aviation Administration;

5. A wireless communications facility, attached, and equipment enclosure shall be removed by the facility owner or property owner within six months of the date it ceases to be operational;

6. Notwithstanding other height limitations in this code all lattice, monopole, guyed or other freestanding support structures shall be limited to a total height, including antennas, of 150 feet above natural grade;

F. *Repealed by Ord. 1397*;

G. Fire and emergency services stations and police substations; training facilities, administrative offices and living quarters for fire, emergency, and police services are permitted in conjunction with these uses, not to exceed 20 full-time persons and 200 day-use visitors. [Ord. 1397 § 4 (Exh. B), 2019; Ord. 1372 § 4 (Exh. A), 2016; Ord. 1271 § 5, 2008; Ord. 1227 § 4, 2006; Ord. 1191 § 4, 2004; Ord. 1139 § 5, 2001; Ord. 1131 § 5, 2000; Ord. 1118 § 5, 2000; Ord. 1055 § 4, 1997; Ord. 579 § 5, 1980. RZ Ord. § 171.020.]

17.171.030 Conditional uses.

When authorized under the procedure provided for conditional uses in this title, the following uses will be permitted in a P zone:

A. Airport and airport-related commercial and industrial uses;

B. Public ball park, exposition, fairground, museum, stock show and related commercial uses subject to MCC 17.171.040;

C. Cemeteries, crematoriums and mausoleums;

D. Dwelling for the caretaker or watchman; housing for the staff required for an approved conditional use;

E. Golf courses, public parks and playgrounds, recreational resorts and retreats, related camping and related commercial uses subject to MCC 17.171.040;

F. Religious organizations and related conference and residence facilities;

G. Schools, elementary and secondary (as defined in Chapter 17.110 MCC);

H. Military training facilities and armory;

I. Public instructions for detention or correction;

J. Residential facilities, institutions and schools for the handicapped or mentally retarded;

K. Public service buildings, structures and uses (e.g., field offices, outdoor storage of equipment, reservoir, water tower, pump station, sewage treatment plant, solid waste disposal site, power generation), except fire, police and emergency service stations;

L. Fire and emergency services stations and police substations; training facilities, administrative offices and living quarters for fire, emergency, and police services exceeding 20 full-time persons and 200 day-use visitors;

M. In the community of Brooks-Hopmere, educational institutions as defined in MCC 17.110.210 and including those in SIC 822. [Ord. 1454 § 4 (Exh. B), 2023; Ord. 1271 § 5, 2008; Ord. 1227 § 4, 2006; Ord. 1191 § 4, 2004; Ord. 1139 § 5, 2001; Ord. 1131 § 5, 2000; Ord. 1118 § 5, 2000; Ord. 1055 § 4, 1997; Ord. 974 § 4, 1994; Ord. 925 § 6, 1992; Ord. 579 § 5, 1980. RZ Ord. § 171.030.]

17.171.040 Scale of commercial uses.

A. New commercial uses in conjunction with public uses may be established up to a maximum of 3,500 square feet of floor area.

B. Lawfully established commercial uses existing as of the date of adoption of the ordinance codified in this title may be expanded up to 3,500 square feet of floor area, or an additional 25 percent of the floor area that existed as of the date of adoption of the ordinance codified in this title, whichever is greater.

C. Airport-related uses located at the Aurora Airport are not subject to the size limitations in subsections (A) and (B) of this section.

D. Except as established in subsection (B) of this section, for a commercial use to exceed the square foot limitations requires taking an exception to Goal 14. Such exception shall be processed as an amendment to the Marion County Comprehensive Plan. [Ord. 1271 § 5, 2008; Ord. 1227 § 4, 2006; Ord. 1191 § 4, 2004. RZ Ord. § 171.040.]

17.171.050 Prohibited and lawfully established existing uses.

A. The following uses are prohibited:

1. Uses of structures and land not specifically permitted in the public zone.

2. New residential dwellings, except when accessory to a primary use. However, a dwelling that legally existed at the time of adoption of the ordinance codified in this title shall not be a nonconforming use, and may be remodeled, expanded, or replaced.

B. Lawfully established commercial and industrial uses that existed prior to zoning or established through the applicable land use process on or before the date of the ordinance codified in this title, not otherwise listed in the zone, are allowed outright and shall not be classified as nonconforming uses.

C. All other lawfully established, existing uses and structures not specifically permitted in the public zone shall be considered nonconforming uses subject to the provisions of Chapter 17.114 MCC. [Ord. 1271 § 5, 2008; Ord. 1227 § 4, 2006; Ord. 1191 § 4, 2004. RZ Ord. § 171.050.]

17.171.060 Property development standards.

A. Height. No building or structure in a P zone shall exceed six stories or 70 feet; provided, that buildings or structures shall be set back from every street and lot line one foot for each foot of height of the building in excess of 35 feet in addition to all other yard and setback requirements herein specified.

B. Front Yard. Front yard shall be a minimum of 20 feet. No parking shall be permitted within the minimum front yard area.

C. Side Yards. Where the side of a lot in a P zone abuts upon the side of a lot in any R zone, there shall be a minimum side yard of 10 feet. Otherwise there shall be no minimum side yard setback. Where the side of a lot abuts upon a street there shall be a minimum side yard of 20 feet wherein no parking shall be permitted.

D. Rear Yard. In a P zone there shall be a rear yard that shall have a minimum depth of 30 feet.

E. Lot Area and Coverage. The minimum requirements in P zones for dwellings shall be one acre except 6,000 square feet inside an unincorporated community boundary where public sewer and water service is provided. No main building, including dwellings, shall occupy more than 30 percent of the lot area.

F. Open Storage.

1. All yard areas, exclusive of those required to be landscaped as provided in subsection (G) of this section, may be used for materials and equipment storage areas related to a use permitted in the P zone, provided such area is screened so it cannot be seen from public roads, or from dwellings on property in other zones.

2. The surface of open storage areas, including automobile and truck parking areas shall be paved or graveled and maintained at all times in a dust-free condition.

G. Landscaping. The area within 20 feet of a street shall be landscaped. As a condition of approval for a conditional use, additional landscaping may be required if necessary to make the use compatible with the area.

H. Performance Standards. No land or structure shall be used or occupied unless maintained and operated in continuing compliance with all applicable standards adopted by the Oregon Department of Environmental Quality.

I. Sewage Disposal. Demonstrate that the development will not exceed the existing carrying capacity of the local sewage disposal system or has an on-site sewage disposal site approved by Marion County or the Department of Environmental Quality.

J. Traffic Analysis. Demonstrate that the development will be consistent with the identified function, capacity, and level of service of transportation facilities serving the site. A transportation impact analysis, approved by the Marion County department of public works, may be required prior to building permit approval. [Ord. 1271 § 5, 2008; Ord. 1227 § 4, 2006; Ord. 1191 § 4, 2004. RZ Ord. § 171.060.]

Chapter 17.177
AIRPORT OVERLAY ZONE

Sections:

17.177.010 Purpose.

17.177.020 Definitions.

17.177.030 Airport districts.

17.177.040 Procedure.

17.177.050 Nonconforming uses.

17.177.060 Marking and lighting.

17.177.070 Variances.

17.177.010 Purpose.

The airport overlay zone is intended to minimize potential dangers from, and conflicts with, the use of aircraft at public airports based on the adopted master plans for each airport. It is to be used in conjunction with the underlying zone. If any conflict in regulation or procedure occurs with the underlying zoning districts, the more restrictive provisions shall govern. This section is intended to comply with Federal Aviation Agency Regulation FAR-77 and all other applicable federal and state laws regulating hazards to air navigation. [Ord. 602 § 5, 1981. RZ Ord. § 177.010.]

17.177.020 Definitions.

A. “Airport” means a public airport as defined in MCC 17.110.040.

B. “Airport elevation” means the highest point of an airport’s usable landing area measured in feet from mean sea level. This elevation above mean sea level shall be shown on the official zoning map.

C. “Airport surfaces” means the specific dimensions, slopes and elevations of the airport surfaces shall be delineated on the official zoning map.

1. “Primary surface” means the surface of the runway and adjacent land on each side of the runway centerline and 200 feet beyond the ends of the runway. The length of this surface is determined by using the existing runway length or the runway length identified in an adopted state airport master plan, if longer. The width is the same as the end of the approach surface that is closest to the runway.

2. Approach Surface. This surface begins at the end of the primary surface. From its initial width, that is the same as the width of the primary surface, it extends upward and outward on both sides of the projected centerline of the runway with a specified slope and terminates where it intersects the horizontal surface.

3. “Horizontal surface” is a horizontal plane which surrounds the airport 150 feet above the airport elevation. The interior portion of this surface terminates where it intersects with the transitional and approach surfaces. Its outer edge terminates where it intersects with the conical surface.

4. “Transitional surface” means an imaginary plane that extends upward and outward from the sides of the primary surface and approach surface to the horizontal surface.

5. “Conical surface” means a surface extending outward and upward from the periphery of the horizontal surface at a slope of 20 to one for a horizontal distance of 4,000 feet.

D. “Hazard to air navigation” means an obstruction determined to have a substantial adverse effect on the safe and efficient utilization of the navigable airspace.

E. “Height” is the highest point of any structure as further defined in MCC 17.110.260. The official zone map identifies the maximum height permitted for any obstruction calculated from the airport elevation as defined in subsection (B) of this section and from mean sea level.

F. “Obstruction” is any structure, tree or other object, including a mobile object, which extends above airport surfaces as defined in subsection (C) of this section.

G. “Runway” is a defined area on the airport prepared for landing and takeoff of aircraft along its length.

H. “Tree” means any natural vegetation. [Ord. 602 § 5, 1981. RZ Ord. § 177.020.]

17.177.030 Airport districts.

In order to carry out the provisions of this airport overlay zone, three airport development districts are provided within the airport overlay zone. These three districts are shown on the official zoning map showing the height limits adopted at the time the airport overlay zone is applied.

A. Airport Development District. This district consists of those lands, waters and airspace area at or below the primary, transitional and approach surfaces described in MCC 17.177.020(C).

1. Use Limitations. Any use, accessory use, buildings and structures otherwise allowed in the underlying zone shall be permitted provided the following requirements are satisfied:

a. No obstruction or object shall be permitted if it extends above the transitional and approach surfaces as defined in MCC 17.177.020(C).

b. Roadways, parking areas and storage yards shall be located in such a manner that vehicle lights will not result in glare in the eyes of the pilots, or in any other way impair visibility in the vicinity of the runway approach.

c. Sanitary landfills, sewage lagoons or sewage sludge disposal shall not be permitted closer than 10,000 feet to the airport runway.

d. No game preserve or game reservation shall be permitted if the animals or birds have the potential to become a hazard to air navigation.

e. No structure or use intended for public assembly shall be allowed except by a conditional use permit.

B. Horizontal Surface District. This district consists of the land, water and airspace underneath the horizontal surface as described in MCC 17.177.020(C).

1. Use Limitations. Any use, accessory use, building and structure allowed in the underlying zone shall be permitted provided the following requirements are satisfied:

a. No obstruction shall penetrate the horizontal surface as defined in MCC 17.177.020(C).

b. Sanitary landfills, sewage lagoons or sewage sludge disposal shall not be permitted closer than 10,000 feet to the airport runway.

C. Conical Surface District. This district consists of the land, water and airspace underneath the conical surface as described in MCC 17.177.020(C).

1. Use Limitations. Any use and accessory uses, buildings and structures allowed in the underlying zone shall be permitted; provided, that no obstruction penetrates the conical surface as defined in MCC 17.177.020(C). [Ord. 602 § 5, 1981. RZ Ord. § 177.030.]

17.177.040 Procedure.

A. An applicant seeking a building permit involving any use or structure regulated by the airport overlay zone shall provide the following information in addition to any other information required in the permit application:

1. Property boundary lines as they relate to the airport approach and the end of the runway;

2. Location and height of all existing and proposed buildings, structures, utility lines and roads.

B. Proposed buildings or structures shall be approved by the building inspector if it is determined that they will not extend above the airport surfaces as defined in MCC 17.177.020(C).

C. An applicant seeking rezoning, a conditional use permit or a variance involving any use, building or structure regulated by the underlying zone or the airport overlay zone shall be reviewed in accordance with the applicable procedure in this title. During this review process, the State Aeronautics Division shall be notified of the proposal and any public hearing, be given an opportunity to comment and be notified of the decision. [Ord. 602 § 5, 1981. RZ Ord. § 177.040.]

17.177.050 Nonconforming uses.

The regulations prescribed by the airport overlay zone shall not be construed to require the removal, lowering or other change or alteration of any structure or tree not conforming to the

regulations as of the effective date of the ordinance codified in this title, or otherwise interfere with the continuance of the nonconforming use except as provided in MCC 17.110.405. Nothing contained herein shall require any change in the construction, alteration or intended use of any structure, otherwise permitted, the construction or alteration of which was begun prior to the effective date of the ordinance codified in this title. [Ord. 602 § 5, 1981. RZ Ord. § 177.050.]

17.177.060 Marking and lighting.

The owner of any existing nonconforming structure or tree shall permit the installation, operation and maintenance thereon of such markers and lights as shall be deemed necessary by the Oregon Department of Transportation to indicate to the operators of aircraft the presence of such airport obstruction. Such markers and lights shall be installed, operated and maintained at the expense of the airport owner. [Ord. 602 § 5, 1981. RZ Ord. § 177.060.]

17.177.070 Variances.

The provisions of this overlay zone may be varied subject to the procedures and criteria for considering variances set forth in Chapter 17.122 MCC. Variances may be allowed where it is found that the proposal will not create a hazard to air navigation, and will be in accordance with the spirit and intent of this overlay zone. [Ord. 602 § 5, 1981. RZ Ord. § 177.070.]

U.S. Department
of Transportation
**Federal Aviation
Administration**

Advisory Circular

Subject: Change 2 to Airport Master Plans **Date:** 1/27/2015 **AC No.:** 150/5070-6B
Initiated by: APP-400 **Change:** 2

1. PURPOSE. This Change 2 incorporates additional guidance on passenger convenience, ground access, and access to airport facilities, as identified in Section 131 of Public Law 112-95, "FAA Modernization and Reform Act of 2012 (49 U.S.C. § 47101(g)(2))." Additional provisions of Public Law 112-95 such as Section 132 (b) which amended the definition of airport planning to include plans for recycling and minimizing the generation of airport solid waste (49 U.S.C § 47102(b)(5)(C)), and Section 133 providing that master plans address issues related to solid waste recycling and waste minimization (49 U.S.C. § 47106(a)(6)(A)) have been addressed in separate FAA guidance. These and related considerations will be incorporated into a future change to this AC.

This change also incorporates relevant updates related to the recent changes to Advisory Circular (AC) 150/5300-13, Airport Design, and references to the new Standard Operating Procedures for preparation and submission of Airport Layout Plans.

2. PRINCIPAL CHANGES. Changed text is indicated by vertical bars in the margins. The primary revisions are contained in Chapters 8 and 10 and Appendix B of this AC. In addition, limited editorial and text revisions since the release of Change 1 to this AC in 2007 are incorporated throughout. A full revision to this AC is underway.

PAGE CONTROL CHART

Remove Pages	Dated	Insert Pages	Dated
i-iii	7/29/2005	i-iii	1/27/2015
iv	5/1/2007	iv	1/27/2015
7-8	7/29/2005	7-8	1/27/2015
13	7/29/2005	13	1/27/2015
27	7/29/2005	27	1/27/2015

Remove Pages	Dated	Insert Pages	Dated
32-33	7/29/2005	32-33	1/27/2015
42	7/29/2005	42	1/27/2015
48-62	7/29/2005	48-67	1/27/2015
65	7/29/2005	71	1/27/2015
73	7/29/2005	79	1/27/2015
75-76	7/29/2005	81-82	1/27/2015
78	5/1/2007	84	1/27/2015
79-83	7/29/2005	85-91	1/27/2015
89	7/29/2005	97	1/27/2015
91	7/29/2005	103	1/27/2015
97-110	7/29/2005	105-118	1/27/2015
129-130	7/29/2005	137-138	1/27/2015



Elliott Black
Director, Office of Airport Planning and Programming

U.S. Department
of Transportation
**Federal Aviation
Administration**

Advisory Circular

Consolidated AC includes Changes 1 and 2

Subject: Airport Master Plans

Date: July 29, 2005 **AC No.:** 150/5070-6B
Initiated by: APP-400 **Change:**

1. PURPOSE. This Advisory Circular (AC) provides guidance for the preparation of master plans for airports that range in size and function from small general aviation to large commercial service facilities. The intent of this AC is to foster a flexible approach to master planning that directs attention and resources to critical issues. The scope of each master plan must be tailored to the individual airport under evaluation.

2. CANCELLATION. This publication cancels Advisory Circular 150/5070-6A, *Airport Master Plans*, dated June 1985. Chapter 10 and Appendix F of this document cancel Chapter 1, Section 5, *Airport Layout Plan*; Appendix 6, Section 2, *Typical Airport Layout Plan*; and Appendix 7, *Airport Layout Plan Components and Preparation*, of Advisory Circular 150/5300-13, *Airport Design*, dated September 1989.

Dennis E. Roberts, Director
Office of Airport Planning and Programming

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Table of Contents

PART I: THE PROCESS OF PREPARING MASTER PLAN STUDIES 1

CHAPTER 1 INTRODUCTION 1
101. Purpose and Application 1
102. Intended Users 1
103. Need for New Guidance 1
104. Function of Master Plan Studies 1
105. Organization and Use of the Advisory Circular 2

CHAPTER 2 CONTENT OF MASTER PLANNING STUDIES 5
201. Tailoring Studies to the Needs of Individual Airports 5
202. Types of Master Planning Studies 5
203. Level of Study Detail 7
204. Products of the Master Planning Process 7
205. Master Plan Reviews by the FAA 8

CHAPTER 3 PRE-PLANNING 9
301. Initial Needs Determination 9
302. Request for Qualifications and Consultant Selection 9
303. Development of Study Design 10
304. Negotiating Consultant Contracts 12
305. Application for Federal Funding 13

PART II: ELEMENTS OF MASTER PLAN STUDIES 15

CHAPTER 4 PUBLIC INVOLVEMENT PROGRAM 17
401. Timing 17
402. Tools and Techniques 18
403. Identify the Stakeholders 20
404. Identify Key Issues 20
405. Documentation Guidelines 20

CHAPTER 5 ENVIRONMENTAL CONSIDERATIONS 23
501. General 23
502. Environmental Considerations in Master Planning Alternatives Analysis 24
503. Further Guidance on Consideration of Environmental Factors in Airport Master Planning 26
504. Documentation Guidelines 26

CHAPTER 6 EXISTING CONDITIONS 27
601. General 27
602. Background Section 27
603. Inventory and Description of Existing Facilities 27
604. Describe Regional Setting and Land Use 30
605. Environmental Overview 31
606. Develop Socioeconomic Data 32
607. Assemble Historical Aviation Activity 32
608. Financial Data 33
609. Documentation Guidelines 34

CHAPTER 7 AVIATION FORECASTS 35
701. General 35
702. Forecast Elements 36
703. Factors Affecting Aviation Activity 37
704. Steps in the Forecast Process 39
705. Documentation 43
706. Source Data 43

CHAPTER 8 FACILITY REQUIREMENTS 47
801. General 47
802. Emerging Trends 48
803. Design Hour Demand 49
804. Security Considerations 50
805. Airfield and Airspace Requirements 50
806. Commercial Service Passenger Terminal Complex 54
807. General Aviation Requirements 60
808. Air Cargo Requirements 61
809. Support Facilities 62
810. Ground Access, Circulation, and Parking Requirements 63
811. Utilities 66
812. Other Requirements 67
813. Documentation Guidelines 67

CHAPTER 9 ALTERNATIVES DEVELOPMENT AND EVALUATION 69
901. General 69
902. Alternatives Analysis Process in Airport Master Planning 71
903. Identification of Alternatives 74
904. Evaluation of Alternatives 76
905. Selection of a Recommended Alternative 78
906. Airport Site Selection 79
907. Documentation Guidelines 79

CHAPTER 10 AIRPORT LAYOUT PLANS 81
1001. General 81
1002. Airport Layout Plan Drawing Set 82
1003. Computer-Aided Design Standards 85

1004. Geographic Information Systems Applications 85
1005. Base Mapping and Data Sources 86
1006. Checklists 87
1007. Approvals 87
1008. Documentation Guidelines 88

CHAPTER 11 FACILITIES IMPLEMENTATION PLAN 91
1101. General 91
1102. Formulation of the Capital Improvement Plan 92
1103. Project Sequencing and the Comprehensive Master Schedule 93
1104. Key Activities and Responsibilities 94
1105. Documentation Guidelines 95

CHAPTER 12 FINANCIAL FEASIBILITY ANALYSIS 97
1201. General 97
1202. Sources of Funding 97
1203. Financial Feasibility 99
1204. Revenue Enhancement 102
1205. Benefit Cost Analysis 103
1206. Documentation Guidelines 103

APPENDIX A GLOSSARY 105

APPENDIX B USEFUL REFERENCE MATERIALS 111
1. FAA Advisory Circulars 111
2. FAA Orders 113
3. Federal Aviation Regulations 114
4. Transportation Security Regulations 114
5. Security-Related Publications 115
6. FAA Reports 115
7. General Airport Publications 116
8. Airport Cooperative Research Program (ACRP) Reports 117

APPENDIX C LIST OF POTENTIAL STAKEHOLDERS 119

APPENDIX D CONSIDERATION OF ENVIRONMENTAL FACTORS IN AIRPORT MASTER PLANNING 121
1. Introduction 121
2. Practice and Process 122
3. Tools 127
4. NEPA Documents of Other Federal Agencies 130
Attachment D-1 Environmental Overview for Master Plan Purposes 131

APPENDIX E AIRPORT SITE SELECTION 133
1. General 133
2. Site Selection Process Overview 133
3. Site Approval 134

APPENDIX F AIRPORT LAYOUT PLAN DRAWING SET 137
1. Airport Layout Drawing 137
2. Airport Airspace Drawing..... 140
3. Inner Portion of the Approach Surface Drawing 141
4. Terminal Area Drawing 142
5. Land Use Drawing 142
6. Runway Departure Surfaces Drawing 143
7. Airport Property Map..... 144

List of Figures

Figure 4-1: Public Meeting 17

Figure 6-1: Timeline of Events 28

Figure 7-1: Sample of FAA Forecast Graphs 35

Figure 7-2: Aviation Demand Elements 37

Figure 7-3: Sample Table from Terminal Area Forecast Summary Report 44

Figure 9-1: Alternatives Analysis Process Example.....73

Figure 10-1: Airport Layout Plan Drawing 84

PART I: THE PROCESS OF PREPARING MASTER PLAN STUDIES

Chapter 1 Introduction

101. PURPOSE AND APPLICATION

This Advisory Circular (AC) provides guidance for the preparation of master plans for all airports. Its intent is to foster the development and adoption of a flexible approach to master planning that devotes resources and attention to critical issues. Planners should tailor an individual master plan to the unique conditions at the study airport. As a result, master plans for individual airports will vary in what elements they include and in the level of detail.

An airport master plan is a comprehensive study of an airport and usually describes the short-, medium-, and long-term development plans to meet future aviation demand. The category of study that includes master plans and master plan updates can therefore be thought of as a continuum that varies by level of detail and associated effort.

The elements of a master planning process will vary in complexity and level of detail, depending on the size, function, issues, and problems of the individual airport. The technical steps described in this AC are generally applicable, although each step should be undertaken only to the extent necessary to produce a meaningful product for a specific airport. However, study elements for large and/or complex airports may involve unique technical analyses beyond those detailed in this AC. The sponsor, the sponsor's consultant, and FAA representatives must carefully prepare a scope of work that reflects the circumstances of the individual airport.

102. INTENDED USERS

This publication is intended primarily for use by members of the aviation community, especially those directly involved in preparing master plans: airport sponsors, airport staff, airport consultants, FAA representatives, and state aviation officials. It will also be useful to airport board members; municipal officials; state, regional, and local planning personnel; and the general public.

103. NEED FOR NEW GUIDANCE

Methods and techniques associated with airport master plan studies have evolved since the last version of this AC was published in 1985. This update incorporates current industry methods and procedures commonly employed in the preparation and documentation of master plan studies.

104. FUNCTION OF MASTER PLAN STUDIES

a. Airport master plans are prepared to support the modernization or expansion of existing airports or the creation of a new airport. The master plan is the sponsor's strategy for the development of the airport.

b. The goal of a master plan is to provide the framework needed to guide future airport development that will cost-effectively satisfy aviation demand, while considering potential environmental and socioeconomic impacts. The FAA strongly encourages that planners consider the possible environmental and socioeconomic costs associated with alternative development concepts, and the possible means of avoiding, minimizing, or mitigating impacts to sensitive resources at the appropriate level of detail for facilities planning.

c. Each master plan should meet the following objectives:

1) Document the issues that the proposed development will address.

2) Justify the proposed development through the technical, economic, and environmental investigation of concepts and alternatives.

3) Provide an effective graphic presentation of the development of the airport and anticipated land uses in the vicinity of the airport.

4) Establish a realistic schedule for the implementation of the development proposed in the plan, particularly the short-term capital improvement program.

5) Propose an achievable financial plan to support the implementation schedule.

6) Provide sufficient project definition and detail for subsequent environmental evaluations that may be required before the project is approved.

7) Present a plan that adequately addresses the issues and satisfies local, state, and Federal regulations.

8) Document policies and future aeronautical demand to support municipal or local deliberations on spending, debt, land use controls, and other policies necessary to preserve the integrity of the airport and its surroundings.

9) Set the stage and establish the framework for a continuing planning process. Such a process should monitor key conditions and permit changes in plan recommendations as required.

105. ORGANIZATION AND USE OF THE ADVISORY CIRCULAR

a. **Structure of the Advisory Circular** – The Advisory Circular is presented in two parts:

1) ***Part I – The Process of Preparing Master Plan Studies*** provides an introduction to the Advisory Circular, an overview of master plan studies, and a summary of the pre-planning process.

2) ***Part II – Elements of Master Plan Studies*** provides a detailed discussion of the various elements of master plan studies, including the components of master plan technical reports and the plan drawings that accompany them.

b. As noted above, Part II of the AC details the individual elements of a master plan study. Although they are presented in the order found in a typical master plan report, issues in some chapters may have a direct bearing on those in other chapters. Environmental and financial feasibility considerations, for example, must be considered throughout the process. These cross-linkages are explicitly identified in the relevant chapters of Part II.

c. The AC includes several appendices of supplemental materials. Appendix A presents a glossary of terms that are commonly used in airport master planning. Appendix B provides a list of useful reference materials, including other advisory circulars, FAA orders, appropriate Code of Federal Regulations, Transportation Security Regulations, security-related publications, FAA reports, and general airport publications. Appendix C provides a listing of potential stakeholders in the public involvement program of the master planning process. Appendix D provides a discussion of environmental factors in airport master planning. Appendix E provides guidance on the site selection process. Appendix F shows the general guidelines in preparing the airport layout plan drawing set.

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Chapter 2 Content of Master Planning Studies

201. TAILORING STUDIES TO THE NEEDS OF INDIVIDUAL AIRPORTS

The guidance in this AC covers planning requirements for all airports, regardless of size, complexity, or role. However, each master plan study must focus on the specific needs of the airport for which a plan is being prepared and the scope of a study must be tailored to the individual airport. Therefore, in a given study certain master planning elements may be emphasized while others may not be considered at all. Although the FAA does not require airports to prepare master plans, it strongly recommends that they do so.

The intent of this AC is to foster a flexible approach in the preparation of airport master plans, enabling planners to focus their resources and effort on critical issues. As a scope of work is developed, the planners and airport sponsors must make decisions regarding two key questions: (1) what type of study should be conducted, and (2) what level of detail should be assigned to the individual elements of the study?

202. TYPES OF MASTER PLANNING STUDIES

a. The master planning process will vary with the size, complexity, and role of the study airport and may include a variety of supporting studies. However, all master planning studies will fall within one of two basic types: Airport Master Plans or Airport Layout Plan (ALP) Updates.

b. **Airport Master Plans** – An airport master plan is a comprehensive study of the airport and typically describes short-, medium-, and long-term plans for airport development. Master planning studies that address major revisions are commonly referred to as "Master Plans," while those that change only parts of the existing document and require a relatively low level of effort tend to be known as "Master Plan Updates." In common usage, however, the distinction refers to the relative levels of effort and detail of master planning studies. In most cases, the master plan will include the following elements:

1) ***Pre-planning*** – The pre-planning process includes an Initial Needs Determination, Request for Proposal and Consultant Selection, Development of Study Design, Negotiation of Consultant Contract, and Application for Study Funding.

2) ***Public Involvement*** – Once the consultant team is under contract and has been issued a notice-to-proceed, establish a public involvement program and identify and document the key issues of various stakeholders.

3) ***Environmental Considerations*** – A clear understanding of the environmental requirements needed to move forward with each project in the recommended development program.

4) ***Existing Conditions*** – An inventory of pertinent data for use in subsequent plan elements.

5) ***Aviation Forecasts*** – Forecasts of aeronautical demand for short-, medium-, and long-term time frames.

6) ***Facility Requirements*** – Assess the ability of the existing airport, both airside and landside, to support the forecast demand. Identify the demand levels that will trigger the need for facility additions or improvements and estimate the extent of new facilities that may be required to meet that demand.

7) ***Alternatives Development and Evaluation*** – Identify options to meet projected facility requirements and alternative configurations for each major component. Assess the expected performance of each alternative against a wide range of evaluation criteria, including its operational, environmental, and financial impacts. A recommended development alternative will emerge from this process and will be further refined in subsequent tasks. This element should aid in developing the purpose and need for subsequent environmental documents.

8) ***Airport Layout Plans*** – One of the key products of a master plan is a set of drawings that provides a graphic representation of the long-term development plan for an airport. The primary drawing in this set is the Airport Layout Plan. Other drawings may also be included, depending on the size and complexity of the individual airport.

9) ***Facilities Implementation Plan*** – Provides a summary description of the recommended improvements and associated costs. The schedule of improvements depends, in large part, on the levels of demand that trigger the need for expansion of existing facilities.

10) ***Financial Feasibility Analysis*** – Identify the financial plan for the airport, describe how the sponsor will finance the projects recommended in the master plan, and demonstrate the financial feasibility of the program.

c. **Airport Layout Plan Updates** – An update of the airport layout plan (ALP) drawing set should be an element of any master plan study. In fact, keeping the ALP current is a legal requirement for airports that receive Federal assistance. An update of the ALP drawing set will reflect actual or planned modifications to the airport and significant off-airport development. An accompanying ALP Narrative Report should explain and document those changes and contain at least the following elements:

1) Basic aeronautical forecasts.

2) Basis for the proposed items of development.

3) Rationale for unusual design features and/or modifications to FAA Airport Design Standards.

4) Summary of the various stages of airport development and layout sketches of the major items of development in each stage.

An ALP drawing set update is an appropriate alternative to a full master plan whenever the fundamental assumptions of the previous master plan have not changed. If there have not been any major changes in airport activity or improvements that have had unanticipated consequences, a master plan update is not necessary. Another situation where only an ALP update would be appropriate is the examination of a single development item, such as runway safety area improvements. As indicated above, an ALP update will typically involve fewer elements than a full master plan study, including only the aviation demand forecasts, an assessment of facility requirements, a facility implementation and financing plan, and an airport layout plan drawing set. If additional steps are required to complete the ALP update, a full master plan study is probably a better choice.

203. LEVEL OF STUDY DETAIL

Although almost every master plan includes the full list of elements discussed above, the complexity of the individual elements will vary, depending on an airport's size, function, and particular issues and problems. Each element should be analyzed only to the extent required to produce a meaningful product for that particular airport. The planning process should consider the facility planning needed to enable a seamless transition to subsequent projects.

The scoping process used by the airport sponsor, the sponsor's consultant, and the FAA to develop a work program for the planning study should determine the appropriate level of detail for each study element. The availability of planning information from Federal, state and local organizations may eliminate the need to develop similar information in a study effort. Chapter 3 contains additional information on the scoping process, while Part II provides greater detail on the various elements of an airport master plan.

204. PRODUCTS OF THE MASTER PLANNING PROCESS

a. The products of the master planning process will vary with the complexity of the effort. Master plans can include the following deliverables:

1) ***A Technical Report*** contains the results of the analyses conducted during the development of the master plan. For complex studies, interim reports may be produced to facilitate coordination with various government agencies, tenants, users, the general public, and other interested parties. At the conclusion of the study, the interim reports are assembled into the final technical report.

2) ***A Summary Report*** is useful in bringing together pertinent facts, conclusions and recommendations for public review.

3) ***An Airport Layout Plan Drawing Set*** contains a graphical representation of the proposed development in the master plan and is typically produced as a separate set of full-sized drawings. In addition, the ALP drawing set is typically included in the Technical Report in reduced form.

4) ***A Web Page*** – Many airport sponsors maintain a public access web page with general information about the governmental unit involved and specific information regarding

the airport or airports operated by the sponsor. The Internet provides an excellent forum for the distribution of information on the progress of the study and its final findings and recommendations.

5) ***Public Information Kit*** – Throughout the master plan study, airport sponsor representatives may be asked to speak to community associations, civic clubs, and other organizations with an active interest in the airport. Visual aids such as models, summary brochures, or computer presentations are excellent tools to use at these events to maintain support for the airport development program.

b. The master plan technical report, summary report, and airport layout plan may be produced as paper versions and/or in an electronic format, as determined by the airport sponsor and the FAA. The electronic format will ease distribution of the final reports after the initial printing is exhausted.

c. It is again emphasized here that the level of complexity of each of these products should be determined during the development of the study design. The airport sponsor and the FAA have the flexibility to assess the level of detail that is appropriate for the individual airport and may identify other deliverables that should be produced to support the study effort.

205. MASTER PLAN REVIEWS BY THE FAA

a. The recommendations contained in an airport master plan represent the views, policies and development plans of the airport sponsor and do not necessarily represent the views of the FAA. Acceptance of the master plan by the FAA does not constitute a commitment on the part of the United States to participate in any development depicted in the plan, nor does it indicate that the proposed development is environmentally acceptable in accordance with appropriate public law. The FAA reviews all elements of the master plan to ensure that sound planning techniques have been applied. However, the FAA only approves the following elements of airport master plans:

1) ***Forecasts of Demand*** – The master plan forecast should be reviewed to ensure that the underlying assumptions and forecast methodologies are appropriate. Paragraph 704.h of this guidance should be used to determine consistency of the master plan forecast levels and the Terminal Area Forecast (TAF). Inconsistencies between the master plan forecast and TAF must be resolved, and the forecast approved, before proceeding with subsequent planning work.

2) ***Airport Layout Plan*** – All airport development at Federally-obligated airports must be done in accordance with an FAA- and sponsor-approved ALP. Furthermore, proposed development must be shown on an approved ALP to be eligible for Airport Improvement Program (AIP) funding. FAA approval of the ALP indicates that the existing facilities and proposed development depicted on the ALP conforms to the FAA airport design standards in effect at the time of the approval or that an approved modification to standard has been issued. Such approval also indicates that the FAA finds the proposed development to be safe and efficient.

Chapter 3 Pre-planning

Planners, along with airport sponsors, must make two major decisions in tailoring a study to the needs of an individual airport: what type of study to conduct and what level of detail to use for the individual elements of the study. This chapter outlines these and other steps of the pre-planning process.

301. INITIAL NEEDS DETERMINATION

a. **Identifying General Need for Study** – The airport sponsor usually identifies the need for a planning study, based on existing or potential shortcomings in the existing plan or airport. These deficiencies may be the result of demand exceeding capacity, the introduction of new aircraft types, or the emergence of a critical environmental problem. The airport sponsor's strategic vision or business plan for the airport may drive the need for a planning study. In addition, national, state, or regional planners may have identified issues requiring the airport sponsor's attention. Alternatively, airport users, such as the scheduled airlines and general aviation pilots, may have identified needs that prompted the airport sponsor to undertake a study. The airport sponsor should formulate priorities to establish which issues are most important. Periodic meetings between the airport sponsor and FAA representatives offer an excellent opportunity to review these issues.

b. **Determining Type of Study** – Deciding whether the study in question will lead to a master plan or to an ALP update largely determines the elements to be included and the required level of effort. Even at this early stage of the process, the airport sponsor and the FAA should be able jointly to determine what type of study is appropriate. The sponsor usually will not make decisions regarding specific variations on the basic study type until the consultant has come on board. Although a master plan study will always include a technical report and an airport layout plan drawing set, supplemental products, which may often be related to public outreach efforts, will usually be determined during the scoping process.

302. REQUEST FOR QUALIFICATIONS AND CONSULTANT SELECTION

a. The current version of AC 150/5100-14 *Architectural, Engineering and Planning Consultant Services for Airport Grant Projects* provides important guidance for consultant selection, and its use is recommended. Another useful reference is "Guidelines to Selecting Airport Consultants" published by the Airport Consultants Council, an aviation industry trade association.

b. As a general rule, airport sponsors hire a consultant to prepare planning studies. Before soliciting statements of qualifications (SOQs) from consultants, the airport sponsor should have a clear understanding of the issues that have defined the need for the study. This information should be provided in the Request for Qualifications (RFQ) that the airport sponsor will issue.

c. The sponsor should assemble an unbiased and technically qualified selection panel to conduct the consultant selection. The qualifications of a firm should be judged on its

experience in similar work and its staff's professional credentials. The planning team that is proposed by the consultant should include firms with relevant experience that can commit to complete the study in the amount of time specified. It is not uncommon for several firms to join together in a master planning effort for the purpose of providing specialized skills or local knowledge and expertise.

d. The sponsor should avoid the use of elaborate submittal requirements or interviews, which add substantially to the cost of the selection process for both the sponsor and the prospective consultants. If the sponsor determines that interviews or requests for additional information are necessary, the sponsor should limit this activity to a short list of three to five firms selected by the evaluation panel.

e. If sponsors anticipate an Environmental Assessment (EA) or Environmental Impact Statement (EIS), they should consult with the local FAA Airports office to determine the appropriate time to begin the consultant selection process. If a sponsor or the local FAA Airports office anticipates the need for an Environmental Assessment, the sponsor should select a qualified environmental contractor to prepare the EA. Sometimes, it may be appropriate for the sponsor to expand the scope of the master plan consultant's responsibilities to include the EA. When the sponsor or the FAA have substantial concerns that the EA may suggest that an action may cause significant impacts, the appropriate FAA Airports office should select the contractor to prepare the EA. This is because if the EA shows that significant impacts would occur, the FAA must select the contractor to prepare its EIS. FAA's selection of the EA contractor in this case saves time by eliminating the need for later contractor selection to prepare the EIS.

303. DEVELOPMENT OF STUDY DESIGN

a. The second decision in designing an effective planning study is to determine the level of detail or depth of analysis for each element. The airport sponsor and the selected consultant should negotiate these basic decisions as the work program is established.

b. The airport sponsor, the consultant, the FAA, and others (as appropriate) begin this process by (1) identifying the airport development issues to be addressed in the master plan and (2) determining the types of analyses and level of effort needed to address each issue individually. Known as "scoping," this is an important step in designing any planning study.

c. The sponsor and the selected consultant should address a broad range of topics during the scoping process. As the scoping process proceeds, the planners must remember that each master plan study is unique and the appropriate scope of work will vary from airport to airport. The airport sponsor is encouraged to develop a scope of work that is appropriate to the circumstances of the individual airport. Some of the specific topics that should be addressed at this time include:

1) ***Goals and Objectives*** – Discuss key airport development issues that the master plan will attempt to resolve. This discussion should answer questions such as: "Why is this master plan study being conducted?," "What are the key issues that need to be addressed in the future development of the airport?," and so forth.

2) ***Data Availability*** – Review the availability of activity forecasts and capacity assessments produced by state and regional system plans and FAA Terminal Area Forecasts and decide how to use them. If these data are not used, the reasons should be discussed with and accepted by all parties, including the FAA. This is especially true for low activity airports where demand/capacity relationships are usually not a critical consideration. Current inventory data may also be available to the consultant as a result of continuous planning efforts by the airport sponsor. Use of these data may reduce the need for new data collection efforts or surveys by the consultant.

3) ***Forecast Horizons*** – Although 5-, 10-, and 20-year time frames are typical for short-, medium-, and long-term forecasts, some studies may want to use different time frames. For any forecast horizon, the short-term forecast should support a capital improvement program, the intermediate-term a realistic assessment of needs, and the long-term a concept-oriented statement of needs. Schedules for airport development that are directly related to demand levels should be tied to those demand levels, rather than dates, since the actual demand will often vary from that forecast, particularly as the time frame increases. At some airports, it may be necessary to look beyond the 20-year time frame to protect the airport from incompatible land use development. The need to do longer range planning must clearly be justified during the scoping process.

4) ***Environmental Considerations*** – Identify the level of environmental documentation that is likely to move forward with the recommendations of the completed master plan study. Sponsors, in consultation with the appropriate FAA Airport's environmental specialist, should identify whether an Environmental Assessment (EA) or Environmental Impact Statement (EIS) may be required or whether categorical exclusions may apply. As noted previously, if sponsors anticipate an EA or EIS, they should consult with the local FAA Airports office to determine the appropriate time to begin the consultant selection process. Consideration should also be given to the appropriate state environmental regulations and the need to develop applicable documentation.

5) ***Schedules*** – Agree upon schedules showing milestones for the completion of technical products and for coordination and review. The schedule should clearly indicate decision points beyond which work should not proceed without FAA or airport sponsor approval, such as FAA review and approval of the master plan forecast.

   Realistic schedule development is important. From a practical standpoint, adhering to the schedule for a complex study, such as a long-range plan for a high activity airport, is very difficult. Less complex studies should not have such a problem. In any case, the schedule for a master plan study should be firm so that all reviewers are aware of their responsibilities with respect to it. The airport sponsor should emphasize the importance of meeting planning process deadlines.

6) ***Deliverables*** – The specific draft and final products of the planning process, and the general level of detail, should be listed in the scope of work and include the number, type, and format of paper reports, drawings, and electronic files.

7) ***Coordination and Public Involvement Program*** – For less complex studies, the FAA, the airport sponsor and the consultant may be the only participants as long as they coordinate with appropriate local officials, stakeholders, and ensure citizen participation through public information sessions. These sessions may be conducted separately or in conjunction with other public meetings. Often written updates for regional or state aviation, transportation and comprehensive planning agencies will be sufficient.

   For complex studies, it may be necessary to organize formal policy, technical, and review committees that meet regularly and use structured communications systems, including public hearings, public information workshops, and web-based information sharing tools. The committee membership may consist of representatives of local, state, and Federal government agencies as well as airport tenants, user groups, community associations, and business organizations. In addition, the active participation of the FAA concerning airspace management, navigational aid and approach aid installation, designation of instrument runways, potential financing of planning and development, and safety and security matters is essential.

   The local FAA Airports office can coordinate the involvement of the FAA organizations that are interested in the development of the airport. Advice from the airlines concerning aircraft types they plan to use and other operational and financial matters will also be essential to the development of an effective plan.

   The airport sponsors staff probably will participate in the day-to-day activities of the planning study. A large airport sponsor will likely have a more extensive management and staff structure than the sponsors of smaller airports.

8) ***Budget*** – Development of the work scope and the associated fees is usually an iterative process. The work scope contemplated in early draft narratives may require fees that exceed a sponsor's budget. Planners must adjust the scope of work, the proposed fees, or the available budget until all three components have been balanced to the satisfaction of the sponsor, the consultant, and the FAA.

d. Careful attention to the development of the scope of work for the master plan study sets the stage for a successful study. Establishing a sound scope of work will also allow the sponsor, consultant, and the FAA to develop a budget that meets the goals and objectives of the study. Failure to do so may result in a study that is lacking vital details that affect the decision making process. It is important to note that Federal planning grants cannot be amended to cover increased costs. If additional work is needed beyond the original scope of work, an additional grant would probably be required. Many of the decisions made at this point will have an impact on the degree of difficulty that is encountered as the development program moves from planning to implementation.

304. NEGOTIATING CONSULTANT CONTRACTS

After scoping the study and negotiating a price for the consulting services, a contractual arrangement must be negotiated.

a. The recommended type of agreement between the airport sponsor and the consultant is a firm, fixed price contract. This is advisable whenever the level of effort can be fairly well predicted and where reasonable fees can be established at the outset. This type of contract imposes a minimum administrative burden and provides incentives for effective cost control and contract performance.

b. Where the level of effort or duration of the study is uncertain, a cost plus fixed-fee contract or a time and materials contract may be required. Also, some airport sponsors, recognizing that master planning often uncovers unanticipated issues that need study, add an on-call component to their consultant contract, which allows the scope and fees to be developed as new tasks are identified. These contract provisions typically provide for payment on a time and materials basis, but not to exceed a specified amount. The use of such contracts must be well justified if Federal financial assistance will be provided. The FAA does not recommend contracts based on a cost-plus percentage of cost and they are not permitted if Federal financial assistance will be provided for the study.

c. Advisory Circular 150/5100-14, *Architectural, Engineering and Planning Consultant Services for Airport Grant Projects,* is also a good reference for guidance on the options for a contract format. The procedures in this AC must be followed if Federal funds are involved.

305. APPLICATION FOR FEDERAL FUNDING

The point at which a sponsor submits a grant application to the FAA varies with the individual study. For large and complex master plans, the sponsor should divide the total grant funding into two phases. The initial phase can fund early tasks such as the definition of issues, inventory of existing conditions, preparation of forecasts, and determination of facility requirements. The second phase grant application could be prepared after the study team has gained a better grasp of the key issues and a more precise cost estimate of the effort needed to complete the master plan. The FAA should be involved in the overall process as early as possible. The FAA can advise the sponsor on the best strategy for obtaining funding and on questions of the eligibility of the elements of the proposed scope of work.

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PART II: ELEMENTS OF MASTER PLAN STUDIES

Part II of this Advisory Circular provides detailed discussions of the elements of a typical master plan study. As noted in Chapter 1, the elements to be included in a particular study will vary depending on the size, function, and challenges facing the study airport. The following key elements of master plan studies are discussed in Part II of this Advisory Circular:

- Chapter 4: Public Involvement Program
- Chapter 5: Environmental Considerations in Airport Master Planning
- Chapter 6: Existing Conditions
- Chapter 7: Aviation Forecasts
- Chapter 8: Facility Requirements
- Chapter 9: Alternatives Development and Evaluation
- Chapter 10: Airport Layout Plans
- Chapter 11: Facilities Implementation Plan
- Chapter 12: Financial Feasibility Analysis

Each chapter in Part II ends with a section titled "Documentation Guidelines." These guidelines are not mandatory, and planners should use their discretion in adopting only the guidelines that are consistent with their negotiated scope of work. Planners also have the flexibility to adopt other documentation guidelines that they feel are better suited to the particular circumstances of a study. Appendix B contains a comprehensive listing of other planning documents and guidelines that may be helpful.

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Chapter 4 Public Involvement Program

The first task in a master plan study, after the consultant receives a notice-to-proceed, is the creation of a public involvement program. The level of public involvement in airport planning should be proportional to the complexity of the planning study and to the degree of public interest. Most planning studies will fall between the minimal requirements of a small airport study and extensive public involvement required of a large and complex study. Particularly complex studies may merit the use of a consultant experienced in the public involvement process.

Figure 4-1: Public Meeting



Source: Portland Airport Project Advisory Committee

Over the course of the study, the public involvement program will encourage information-sharing and collaboration among the airport sponsor, users and tenants, resource agencies, elected and appointed public officials, residents, travelers, and the general public. Collectively, these various groups form the stakeholders who have an interest in the outcome of the study. An effective public involvement program should provide these stakeholders with an early opportunity to comment, before major decisions are made; provide adequate notice of opportunities for their involvement; and should provide for regular forums throughout the study.

401. TIMING

Public involvement has its greatest impact during the early stages of the planning process, before irreversible decisions have been made and while many alternatives can be considered. When the stakeholders become involved before major decisions or commitments are made, the planners can better deal with issues of community concern and improve the chances of reaching a consensus on controversial matters. If stakeholders become aware that the important decisions were made before they were invited to participate, they may distrust the planners. In addition, when public involvement opportunities are not provided until late in the planning process, there may not be enough time to make significant changes. The tendency, instead, will be for planners to merely defend previously determined courses of action, rather than exploring any new alternatives. An effective public involvement program will usually avoid such an undesirable outcome.

402. TOOLS AND TECHNIQUES

The study team may use a variety of forums, such as committees, public information meetings, small group meetings, and public awareness campaigns in a public involvement program. The selection of a specific platform depends on the particular complexities associated with the airport, the expected public interest in the master plan, the practices and policies of the airport sponsor, and budget considerations. In addition, it may be necessary to consider the special needs and sensitivities of low income and minority populations, consistent with the provisions in Executive Order 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*. Although the public involvement program is important to the master plan effort, planners must balance the need for stakeholder involvement with the costs of such a process. Complex, large, or unfocused stakeholder groups can impede meaningful input, unnecessarily raise study costs, and frustrate participants as they struggle to communicate with the study group.

a. **Committees** – Committees that facilitate the public involvement program often include a Technical Advisory Committee (TAC) and a Citizen's Advisory Committee (CAC). The TAC is responsible for providing input and insight on technical issues. Committee members typically have a high level of technical competency associated with some aspect of aviation or airport operations and are major stakeholders in the airport's operation. The CAC serves as a sounding board and information exchange group for stakeholders, reviews the planning team's plans and proposals, interacts with the planning team members during the review, makes consensus recommendations to the planning team, and finally gives its recommendations on the finished plan to the airport sponsor. The membership of the CAC should be representative of all stakeholders.

   In reviewing the master plan, the TAC will evaluate its technical merit, while the CAC will weigh the recommendations against community goals, values, and needs. The committees are advisory, however, and have no decision making power of their own. In establishing these committees, the airport sponsor does not delegate its authority and responsibilities to them. The specific roles of such committees should be clearly defined at the outset and carefully explained at the initial meeting to prevent later misunderstandings. The size of both the TAC and CAC should be kept manageable. In some cases, it may be appropriate to combine the committees into a single group.

   The public involvement program should also include a management/policy/oversight committee to advise the planning team on policy decisions that will likely need to be made throughout the study. Committee members would typically include senior airport or airport sponsor staff that have the responsibility for decision making for the airport.

b. **Public Information Meetings** – Traditional public hearings, where stakeholders are given the opportunity to make public statements about the study, are not a good forum in which to conduct a continuing discussion of issues and alternatives because of the formal and inflexible nature of such hearings. An "open house" format with interactive information stations staffed by knowledgeable staff or consultants is more informal, yet a very effective method by which to engage the public and stakeholders in soliciting their opinions on development options. A public information meeting using the open house format will permit stakeholders to visit a meeting site at their convenience and visit with

planners on an informal one-on-one basis. A short slideshow or videotape, which all attendees can view upon arrival at the open-house site, may be a useful introduction to the study process. If a more formal meeting is desired, starting with an open house and moving into a more formal forum can be effective.

The number of public information meetings to be held over the course of the study can vary depending on the complexity of the study. It may also be necessary to hold meetings in more than one location to provide adequate geographic coverage for communities affected by the planning proposals. Public information meetings are typically held in the evening to provide most people the opportunity to attend. In some unique conditions, such as with a large elderly population, a day meeting may be needed. Complex projects may require that these meetings be scheduled throughout the day.

c. **Small Group Meetings and Briefings** – Small group meetings may be held throughout the study to provide opportunities for detailed discussions of plan alternatives. These informal sessions allow study team members to learn about local concerns. Such meetings may be scheduled with community boards, elected officials, civic organizations, and other interested organizations.

d. **Public Awareness Campaign** – An effective public awareness campaign is an essential part of the public involvement program. It is instrumental in generating initial stakeholder involvement, in maintaining stakeholder interest throughout the program, and in keeping the general public informed of the progress of the study.

1) ***Informational and Educational Materials*** – Informational materials designed to educate a broad audience about all aspects of the study may be distributed to stakeholders. These materials might include fact sheets, flyers, press releases, newspaper ads, and general information packets. Planners should provide translations of this material if the airport is located in an area where English is not the first language for a large percentage of the residents. A mechanism should be provided for individuals or organizations to add their names to a mailing list to receive these materials.

2) ***Web Pages*** – Web pages, with interactive or self-guided presentations, as well as electronic copies of study documents, are increasingly used as part of a public awareness campaign. Planners often link the master plan web page to the airport's web site.

e. Public involvement programs can place special requirements on an airport planning team. The team must be sensitive to the interests of stakeholders and have a positive attitude toward their participation in the planning process. The members of the team must also be aware of the extra time and personal effort that will be required, since they will have to meet regularly with the stakeholders at committee and public information meetings.

The same planners who work with the stakeholders at the various stakeholder forums should do the actual planning. Experience shows that planners must gain the confidence of the stakeholders and overcome their initial concerns before any real progress can be

achieved. Extensive public involvement from start to finish in the planning process enhances all plans and proposals and satisfies the goals of long-range planning.

403. IDENTIFY THE STAKEHOLDERS

The types of stakeholders will vary at each airport, depending on the size of the airport and the complexity of the planning issues. The following is a list of the general categories of potential stakeholders, from which a list of appropriate participants can be developed:

- Users and tenants
- Groups and individuals from within the sponsor's organization
- FAA personnel from the appropriate Regional and Field offices
- Resource agencies and other governmental units with regulatory or review authority
- Other interested groups

The individuals from a particular stakeholder group must be able to effectively represent their interests in discussions with the master plan preparation team. Furthermore, they should present the consensus view of the stakeholder group and not a special interest minority opinion. Although planners should make every effort to identify and communicate with all appropriate stakeholders early in the master plan process, it may also be necessary to add stakeholders as the study progresses. They must also be able to take study information back to their group to keep them informed throughout the planning process. Appendix C contains a more detailed list of potential stakeholders.

404. IDENTIFY KEY ISSUES

a. The identification of key issues is an early product of a well-designed public involvement program. Recall that the pre-planning activities identified in Chapter 3 included establishing which issues are of greatest concern to the airport. The results of that effort are essential in determining the type of study to be completed and in developing the scope of work. These will probably not include all issues that are of concern to each of the stakeholders. Discussions with the stakeholders (through use of the tools and techniques described earlier in this chapter) will help identify a broader set of problems, challenges, and opportunities that should be examined. These key issues will shape policy decisions, influence technical criteria and standards, and help identify development alternatives.

b. Once the key issues are identified, the sponsor may want to modify the study approach to address any important issues that had not been previously included in the proposed study. Some issues may be raised during this process that are not appropriate to include in the master plan study; these should be addressed outside of the master plan effort. The airport sponsor may establish a separate forum to handle such issues.

405. DOCUMENTATION GUIDELINES

a. **Document Key Issues** – Accurate documentation of the key issues is essential, because stakeholders will track how the planning team addresses them throughout the study. Grouping the critical issues into major functional categories, such as facilities, business,

operational, properties, and environmental issues, will help planners understand the stakeholders' concerns. The documentation should divide issues into those that will be addressed by the master plan study and those that will be addressed in a different forum.

b. **Document Public Involvement Program** – Documentation of the public involvement program should appear in an appendix to the Master Plan. Copies of committee rosters, meeting minutes, advertisements, newsletters, and other elements of the Public Awareness Campaign can be placed in an appendix as the official record of the public involvement program. This documentation should be revised regularly over the course of the study rather than being prepared at the end of the process.

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Chapter 5 Environmental Considerations

501. GENERAL

a. The purpose of considering environmental factors in airport master planning is to help the sponsor thoroughly evaluate airport development alternatives and to provide information that will help expedite subsequent environmental processing. By using existing maps of the airport area, prior environmental documents, and the Internet, planners and environmental specialists can get an excellent overview of sensitive environmental resources in and around the airport. The planner should understand that the consideration of environmental factors in the evaluation of alternatives should be tailored to each airport's size, unique setting, and operating environment, and will typically not be as detailed as that in subsequent environmental reviews. The consideration of environmental factors in the planning process will typically result in an inventory (overview) of the airport's environmental setting, the identification of potential environmental impacts of airport development alternatives, and the identification of environmentally related permits that may be required for recommended development projects.

b. The FAA recommends that the planning process consider the needs of subsequent environmental review processes. The master plan should include thoroughly supported project justifications and thorough documentation of alternatives that meet the planning need and are reasonable and feasible (environmentally as well as technically); and should note any effects of the airport development alternatives on sensitive environmental resources. Considering environmental factors in master planning provides useful information and planning principles that will help expedite the environmental review of projects.

c. Planners should develop each chapter of the master plan with environmental considerations in mind. Normally the environmental considerations should not be in a stand-alone chapter, but should be incorporated into the appropriate chapters, such as existing conditions and alternatives development and evaluation.

d. When considering environmental factors in master planning, the planner and environmental specialist do not need to follow the specific impact categories outlined in FAA Order 5050.4, NEPA Implementing Instructions for Airport Projects. Rather, FAA Order 5050.4 should be consulted as a guide to help planners identify potential environmental impacts specific to the study airport that should be considered as planning continues.

e. During the master plan scoping process, planners and environmental specialists should attempt to identify key environmental issues that will be involved in analyzing airport development alternatives to ensure that the master plan budget provides enough resources to analyze them. If such early identification is not possible, planners should propose an initial budget for the issues that may be identified during the master planning inventory and data collection process. If additional environmental issues are uncovered later in the planning process, the planner can prepare a separate scope and budget for a more detailed

analysis. However, sponsors and planners should be aware that Federal planning grants cannot be amended and the more detailed analysis would need to be accomplished in a separate study.

f. Planners, in consultation with environmental specialists, should consider appropriate Federal environmental laws and regulations when analyzing proposed airport development alternatives. There are approximately 40 Federal laws, executive orders, and regulations protecting particular parts of the environment, such as the Clean Air, Clean Water, and Endangered Species Acts, and an Executive Order on Protection of Wetlands. There are also many state and local environmental laws and regulations that should be considered in the master planning process.

g. During the master plan scoping process, planners should try to identify any potential short-term capital development projects that might be recommended in the master plan that are known to trigger additional environmental processing, such as safety related projects. For such projects, the airport sponsor should consider beginning the environmental processing before the master planning process is completed. Otherwise, the various agencies and public involved may perceive that the NEPA analysis is biased because a recommended alternative was selected in the master plan before the NEPA process began. This guidance can be extended to longer-term projects in the case of new airports or major reconfigurations of existing airports.

h. Planners should recognize the need to achieve a balance between the manmade and the natural environment. Although every proposed development project will have some impact on the natural environment, the use of prudent planning criteria, along with sound environmental data and analysis, will help minimize unavoidable environmental impacts and the delay of project design and construction.

502. ENVIRONMENTAL CONSIDERATIONS IN MASTER PLANNING ALTERNATIVES ANALYSIS

a. In the airport master planning process, the planner, along with an environmental specialist, should identify potential key environmental impacts of the various airport development alternatives so that those alternatives that avoid or minimize impacts on sensitive resources are considered. The planner should understand that the consideration of environmental factors in the evaluation of alternatives should be tailored to each airport's size, unique setting, and operating environment, and will typically not be as detailed as that in subsequent environmental reviews. The evaluation of potential environmental impacts should only be done to the level necessary to evaluate and compare how each alternative would involve sensitive environmental resources.

b. Project justifications and the analysis and selection of alternatives, including an explanation of why certain alternatives were not carried forward, should be completed and documented in the master plan before the NEPA process is started. Only those alternatives that could solve the identified problems and have aeronautical utility should be forwarded for NEPA analysis. (See Appendix E, "Consideration of Environmental Factors in Airport Master Planning," for additional discussion of this topic.)

c. Environmental factors should be considered during the development and analysis of airport project alternatives. This evaluation can help an airport sponsor identify a recommended alternative that the FAA may eventually select as its preferred alternative during the NEPA review process. It also facilitates the decision making process the FAA must complete as part of its project approval process.

1) The facility requirements and alternatives analysis chapters of the master plan should provide sufficient documentation regarding the justification for each project so that these chapters may serve as the basis for the purpose and need section of any environmental document.

2) Planners and environmental specialists should identify the potential key environmental impacts of each development project as part of the master plan alternatives analysis. Categories of potential impacts are defined in FAA Order 1050.1, *Environmental Impacts: Policies and Procedures* and FAA Order 5050.4, FAA Airports guidance for complying with NEPA. A matrix showing each alternative and its potential environmental impacts may be useful for subsequent environmental processing.

3) For some airports, only a few of the environmental impact categories will need to be discussed in the alternatives analysis (such as noise, wetlands, and social impacts), based on location-specific environmental issues identified in the environmental overview. Planners do not need to list each specific impact category mentioned in FAA Order 5050.4, but only those resources the alternatives would likely affect. In many cases, a simple environmental screening will be sufficient to identify those impacts. Detailed impact analyses will be conducted in any Environmental Assessment or Environmental Impact Statement that follow the master plan.

d. Permits that may be needed for each proposed project should be identified in the alternatives analysis. Although such requirements can vary greatly from state to state and within each locality, some of the permits that are usually necessary include:

- Clean Water Act, Section 404 Dredge and Fill Permit
- Air Quality Permit for on-site batch plants or other construction-related activities
- Local government construction permits
- Growth Management Permits
- United States Fish and Wildlife Service, National Marine Fisheries Service opinions, or State Wildlife and Game Commission Permits, if protected and endangered species could be impacted
- Clean Water Act, National Pollution Discharge Elimination System Permits

503. FURTHER GUIDANCE ON CONSIDERATION OF ENVIRONMENTAL FACTORS IN AIRPORT MASTER PLANNING

Appendix D, "Consideration of Environmental Factors in Airport Master Planning," contains recommendations on how to evaluate environmental factors for large or complex projects in airport master planning. It contains a discussion of the interaction of the airport planning and environmental processes and recommendations on how to effectively integrate these processes. The appropriate treatment of environmental factors in airport master planning can make subsequent detailed environmental processing more efficient and speed the completion of airport development. Although Appendix D is primarily intended for large and complex projects, many of the techniques in the guide can be applied to all levels of master planning.

504. DOCUMENTATION GUIDELINES

a. The existing conditions chapter should document the airport's environmental setting. The alternatives analysis chapter should document the potential environmental impacts associated with each development project alternative. In addition, the master plan should identify potential Federal, State, and local permits that may be required for each project alternative. Planners, with the help of environmental specialists, should include a matrix in the alternatives analysis chapter of the master plan that lists each development project alternative and its associated potential environmental impacts and required permits. This will be beneficial in subsequent environmental processing.

b. Planners should use appendices for the majority of the technical documentation, such as noise analysis, wetland mapping, and threatened and endangered species reports to improve the readability and organizational flow of the alternatives analysis chapter.

c. The potential environmental impacts of the proposed airport development alternatives should be addressed in a candid manner and written so that the public easily understands them.

Chapter 6 Existing Conditions

601. GENERAL

a. Most data gathering for a master plan study takes place when planners evaluate existing conditions. Typical broad categories of information to be collected include: the history of the airport; description and condition of physical facilities on the airport including buildings and airfield pavement; the regional setting of the airport and surrounding land uses; the environmental setting of the airport; socioeconomic and demographic data for the airport service area; historical aviation activity; and airport business affairs.

b. To initiate data collection, planners should carefully review the scope of work and verify the type and quantity of data needed for subsequent analyses. It is easy to collect information that is not really necessary or to fail to gather critical information needed for later analyses. Planners can avoid these mistakes by carefully reviewing the scope of the study.

c. To avoid unnecessary data gathering, planners should use existing data as much as possible. Previous master plans, other recent planning studies, and regional planning agencies can provide useful information that should be reviewed before any data gathering begins. However, planners should ensure the validity of the existing data before using them for the master plan study.

602. BACKGROUND SECTION

a. The background section should provide a brief overview of the history of the airport, describe its aeronautical role in the national aviation system, and identify its role in the community's infrastructure. Many sponsors periodically assemble information about the economic benefits of their airport, such as employment, direct salaries, and air service, which can be summarized in the background section.

b. Major milestone events in the history of the airport, such as ownership changes, construction of significant facilities, and the introduction of air service can be identified. A timeline, like that shown in Figure 6-1, may be used to present this information.

603. INVENTORY AND DESCRIPTION OF EXISTING FACILITIES

a. A significant portion of the inventory will be devoted to identifying the existing physical facilities at the airport. Drawings and other documents in FAA databases and on file with airport management are a good source of data and should be reviewed early in the inventory effort. These data may need to be supplemented with field observations, personal interviews with tenants and users, Internet searches, and surveys of passengers and employees.

Figure 6-1: Timeline of Events

1928 – Original land donation

1934 – Airport officially opened



1934

1937 – First commercial airline flight

1941 – Additional 40 acres donated

1953 – Dedication of new terminal building and ATCT



1975

1960 – VORTAC installed

1970 – Passenger terminal expanded

1975 – New ATCT constructed

1987 – Airport Authority established

1990 – Airport master plan updated

1998 – Terminal expansion began



1998

b. Classifications that are commonly used to organize this information include the following:

1) ***Airfield/Airspace*** – The functional use and geometry of runways, taxiways, and holding aprons; lighting, marking, and signing of runways and taxiways; navigational aids; visual approach aids, and instrument approach procedures. Information on the use of the airspace and how air traffic is managed should also be collected, including operational limitations resulting from traffic interaction with other airports or reserved airspace, obstructions to air navigation, noise abatement procedures, and airfield or navigational aid shortcomings. Planners should also compile historical data on weather conditions, such as prevailing wind direction and speed, as well as the occurrence of critical combinations of ceiling and visibility. The existence of, and the need for, Remain-Overnight-Parking (RON) should also be determined.

2) ***Commercial Passenger Terminal Facilities*** – Inventory of terminal building space by functional use and size: check-in hall/ticket lobby, number of gates, lineal feet of gate frontage, aircraft parking apron area, restaurants and other concession space, and passenger security screening procedures. Surveys conducted in hold rooms are often used to gather information about passenger characteristics that can be useful in determining future facility requirements.

3) ***General Aviation Facilities*** – The quantity and type of hangars; transient aircraft parking apron areas, tie-down positions; general aviation terminal facilities; aircraft parking aprons; fixed base operators; flight schools; pilot shops; and the number and mix of based aircraft.

4) ***Cargo Facilities*** – The quantity and area of air cargo buildings and aircraft parking aprons. At airports with significant air cargo activity, freight forwarders and other support functions are often located in areas adjacent to the airport. These should be identified on the airport layout plan.

5) ***Support Facilities*** – The quantity and type of support facilities at an airport that encompass a broad set of functions that ensure smooth and efficient airport operation, include Aircraft Rescue and Fire Fighting stations, airport administrative areas, airport maintenance facilities, airline maintenance hangars, flight kitchens, aircraft fuel storage, heating and cooling systems, FAA facilities. For airport towers, determine their hours of operation.

6) ***Access, Circulation and Parking*** – The quantity and type of ground access systems and commercial areas that serve the airport, or are served by it, such as on-airport access roads, circulation and service roads, parking and curb space, including information on their alignment, condition and capacity. Also include information on public transportation services, such as bus, rail, taxi and limousine, and the split between personal and public transportation. Consultation with state and local transportation agencies responsible for planning and operating surface transportation systems should produce data on proposed highway and transit plans, as well as traffic density statistics relative to surface systems leading to and from the airport. Furthermore, include information on rental car facilities and activity. It may difficult

to obtain information from rental car companies, but rental car facility planning is typically a critical element of planning for the terminal area and parking facilities, even at smaller airports.

7) ***Utilities*** – Description of major elements of the infrastructure that service the airport's utility demands for water, sanitary sewer, communications, heating and cooling, and power. Historical consumption data may be necessary to quantify future utility loads. Storm-water drainage, deicing and industrial waste disposal systems should also be included.

8) ***Other*** – Non-aeronautical uses such as recreational facilities and parks, industrial parks, agricultural or grazing leases, and retail businesses.

c. The inventory of existing facilities need not include all the classifications described above. That list is a general outline that should be modified to conform to the specific circumstances of an individual airport. For example, a general aviation master plan does not need a section on commercial passenger terminal facilities. Similarly, a plan for a large commercial service airport with little general aviation or air cargo activity could include the inventory of those facilities in a subsection describing support facilities.

d. Whatever format is used to describe existing conditions should be followed in subsequent chapters, using a parallel structure, to describe demand/capacity and determination of facility requirements, identification and evaluation of alternatives, presentations of estimated capital costs, and the airport plans chapter.

e. The inventory of existing conditions at an airport is a critical task in a master plan study and must be closely managed. Data should be collected only when there is a clear understanding of the need for the information to support the demand/capacity analyses and determination of facility requirements.

604. DESCRIBE REGIONAL SETTING AND LAND USE

a. A master plan study should examine the regional setting of an airport and the land use patterns around it. This is a critical task, because the impact of airport planning decisions can extend well beyond the airport property line.

b. Collect information on the political boundaries of the airport and the political entities with jurisdiction over the operation of the airport and adjacent land uses. Identify the airport service area and the presence and role of airports that might compete with the study airport.

c. Collect all applicable documents, such as official maps, the latest area-wide comprehensive land use and transportation plan, applicable municipal zoning ordinances and other land use controls and unusual building code provisions, including height zoning ordinances, noise overlay zones, and airport overlay districts. The development of practical land use strategies requires an understanding of the political context and local preferences regarding land use.

d. Identify the land uses in areas that will be exposed to airport operations. Land use is a continuously changing process, particularly in urban environments, so the land use inventory should collect information on planned and proposed land uses, as well as on existing uses. Note if there are any governmental programs designed to direct land use patterns in the area under review. For example, if the airport sponsor has completed a noise compatibility-planning program, it should contain valuable information on land use.

e. Identify land uses that may affect the safe operation of the airport or influence its expansion. Structures that could obstruct air navigation, or the presence of other airports that may interfere with the study airport, are the principal safety concern. Also identify areas located near the airport that may represent a potential hazard to aircraft, such as flood control areas, stockyards, and sanitary landfills.

f. Use geographic information systems (GIS), aerial photographs, topographical maps, obstruction charts, aeronautical charts, approach plates and other mapping tools to examine and display land use details. Many local governments have comprehensive GIS systems that contain electronic files for land use analysis and zoning.

g. Consider off-airport drainage and flood control issues, which may be affected by airport development.

605. ENVIRONMENTAL OVERVIEW

a. The principal objective of an environmental overview is to document environmental conditions that should be considered in the identification and analysis of airport development alternatives. In the past, master plan studies often focused only on the environmental consequences of the recommended development plan. In those cases, much of the environmental overview would be conducted while other technical analyses were already underway and the environmental data would not be considered in the formulation of alternative development concepts. Current practice is to develop the alternatives with the subsequent environmental processes in mind and to consider environmental data in the evaluation of the alternatives. As a result, the master plan may aid in the formation of the purpose and need statements in subsequent environmental documents.

b. Noise levels and air and water quality are the most common environmental concerns. However, other environmental conditions in and around the airport should also be examined, including: solid waste generation and disposal; toxic material disposal; floodplains and wetlands; endangered and threatened species of flora and fauna; biotic communities; parklands and recreational areas; historic, architectural, archaeological and cultural resources; and prime and unique farmland. Planners should refer to the current version of FAA Order 1050.1, *Environmental Impacts: Policies and Procedures,* for a complete list of environmental impact categories that may need to be examined. In addition to NEPA requirements, planners should consider appropriate state environmental regulations. Past and current uses of airport property should be examined to identify areas that may be contaminated, including fuel farms, chemical or agricultural aerial application refilling stations, and hangar areas used for various industrial processes such as aircraft maintenance and plating.

c. Planners should ask local resource agencies to provide any information they think should be considered in the process of identifying and evaluating alternative development options.

d. Any existing airport noise or environmental programs should be discussed in the environmental overview.

e. When cost effective, data collected in the environmental inventory can be placed in a GIS database for better data visualization, communication, and analysis.

606. DEVELOP SOCIOECONOMIC DATA

a. Socioeconomic data serve two purposes in a master plan study: to ascertain the nature of the community and market the airport serves and/or impacts and to provide specific inputs for the preparation of aviation demand forecasts, particularly econometric demand models.

b. An effective understanding of the community is helpful in ensuring that the planning is responsive to its long-term needs. Planners should focus on those socioeconomic factors that affect the community's need for air transportation. For example, an economy based on tourism would have air transportation needs that would be quite different from those of an agricultural region.

c. A vast array of socioeconomic data are available from many different sources, including a number of commercial vendors; the U.S. Bureau of the Census; metropolitan planning commissions; and state, county, or local agencies. Planners should be careful when using different sources of socioeconomic data to ensure compatibility.

607. ASSEMBLE HISTORICAL AVIATION ACTIVITY

a. The historical data necessary for forecasting aviation demand are generally available in the records maintained by the airport. At airports with FAA airport traffic control towers, FAA records of operations by commercial service, air taxi, military, and general aviation aircraft and revenue passenger enplanements are available in the Air Traffic Activity Data System (ATADS) on the FAA Policy Office's data system website at http://www.apo.data.faa.gov/. At airports without control towers, airport records, FAA Form 5010, *Airport Master Record,* and airport system plan studies are good sources of information.

For commercial service activity, planners should collect data that identify the air carriers; the proportion of operations and enplanements by each; markets served; the number of originating, terminating, and connecting passengers; the proportions of domestic and international passengers; and air cargo activity. It will also be useful to have a breakdown of the fleet mix of aircraft using the airport.

For general aviation activity, planners should collect data that identify the category and class of aircraft, types of fuels those aircraft use, the type of airport services used, and the availability of hangars for tenant and transient aircraft.

b. Master plans for large airports often involve the use of computer simulation models. For an airfield simulation, planners will need a detailed schedule of arrival and departure times for all commercial operations. Records for average or peak days can often be obtained from airport tower records, radar tapes, or noise monitoring systems. Commercial vendors such as the *Official Airline Guide* can also be helpful. For terminal and landside simulations, planners will need the passenger flow volumes in each terminal associated with the aircraft schedules.

608. FINANCIAL DATA

Airport master planners must examine an airport's financial resources, including its basic business model, operating revenues and expenses, and sources and uses of capital funds.

a. **Airport Business Model** – Summarize the airport's basic business model to help planners organize the vast amount of financial data available at most airports. The business model summary should describe the financial operations of the airport, including how its costs and revenues are charged or credited to airport users and how any operational surplus or deficit is handled. In addition, the business model summary should outline how the airport typically funds capital projects (i.e., with AIP and other grants, Passenger Facility Charges, airport revenue bonds, and so forth). If the airport sponsor owns and operates a multi-airport system, the business model summary should discuss how the financials for the study airport are addressed in relation to the whole airport system.

b. **Operating Revenues and Expenses** – Summarize broad categories of operating revenues and expenses. The FAA requires all commercial service airports to submit financial information to the FAA annually on FAA Form 127 and these reports may provide a good starting point. Airport managers often divide operating revenues into airline revenues and non-airline revenues. Non-airline revenues are often subdivided into categories such as terminal concessions; rental car; parking; hangar, land, and other rentals; other; and tax revenues. Operating expenses are often divided into broad categories such as personnel, maintenance, utilities and supplies, other, and debt service.

c. **Capital Funding** – Summarize the airport's ongoing capital improvement program and how it funds its capital development program. The capital improvement program can be funded from many sources, including revenues from the airlines, concessionaires, other airport tenants, tax levies (if applicable), passenger facility charges, AIP grants, other federal and state grants-in-aid, and airport revenue bond proceeds.

The financial feasibility of the capital improvement program will be determined largely by the magnitude and reasonableness of the charges, rents, and taxes paid by airport users, tenants, and others. The information collected in this inventory will be used to prepare a financial plan for the recommended development program.

Much of the information discussed in the preceding paragraphs relates primarily to the financial data for commercial service airports and larger general aviation airports. Many

smaller general aviation airports will not have such data readily available; however, such information may be part of the financial records of the sponsor.

609. DOCUMENTATION GUIDELINES

a. The documentation of existing airport conditions should make liberal use of drawings, tables, aerial photographs, and exhibits produced from geographic information system databases. Presented in this manner, such information is easy to understand, interpret, and locate for later reference.

b. Planners do not need to include all collected information in the report. Some should simply remain in work files until needed to support the technical analyses.

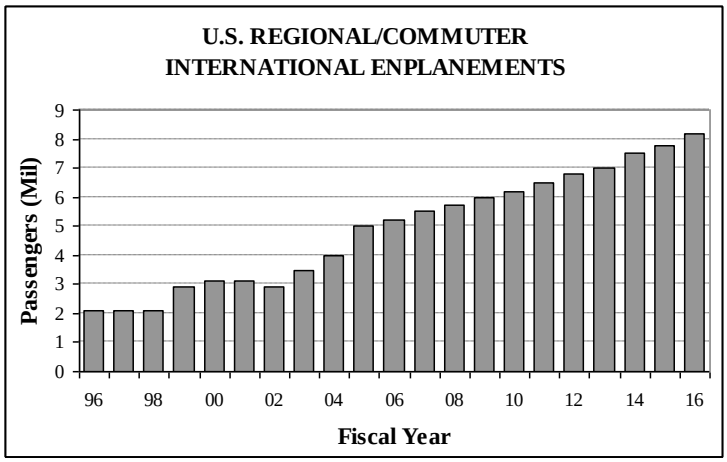
Chapter 7 Aviation Forecasts

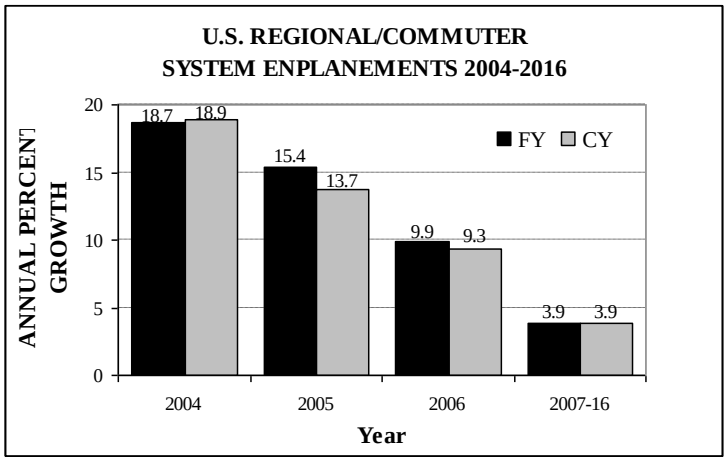
701. GENERAL

a. **Purpose of Aviation Forecasts** – Forecasts of future levels of aviation activity are the basis for effective decisions in airport planning. These projections are used to determine the need for new or expanded facilities. In general, forecasts should be realistic, based upon the latest available data, be supported by information in the study, and provide an adequate justification for airport planning and development. Any activity that could potentially create a facility need should be included in the forecast.

Planners should prepare a reliable activity baseline, select an appropriate forecast methodology, develop a forecast, compare it to other forecasts for reasonableness, and submit the forecasts to the FAA for approval. The planning agency should use appropriate statistical techniques to estimate activity where actual operations counts are not available.

Figure 7-1: Sample of FAA Forecast Graphs





Source: FAA Aerospace Forecasts, Fiscal Years 2005-2016, U.S. Department of Transportation, Federal Aviation Administration, Office of Aviation Policy & Plans, March 2005

b. **Level of Forecast Effort** – The level of effort required to produce a planning forecast will vary significantly from airport to airport. Considerable effort, including the use of elaborate forecasting tools and techniques, may be warranted in the case of more complex projects. An existing forecast, on the other hand, may be all that is required for simpler projects. Planners should determine the appropriate level of forecasting effort in the course of pre-planning and scoping the study.

   A number of forecasts are readily available for use in developing and evaluating the master plan forecast. These include the Terminal Area Forecast (TAF), state aviation system plans, and other planning efforts.

c. **Use of the Forecasts** – Prior to use in the master plan, the proposed forecasts must be submitted to the FAA for review and approval. Once approved, the forecasts may be used to provide an initial timetable for facility improvements, as a basis for the development of alternatives to meet the projected demand, and as a basis for environmental analyses and economic and financial plans

702. FORECAST ELEMENTS

a. **Types of Aviation Activity** – To establish the demands likely to be placed on airport facilities, forecasts should include all relevant aviation demand elements, including both the type and level of aviation activity expected at the airport over the planning horizon. The specific activity elements to be forecast will vary depending on the size and category of an airport and the objectives of the master plan study. Planners should note if the forecast projects the introduction of jet aircraft at the study airport, since this will be important to the future environmental review process.

   Aviation demand forecasts typically include aircraft operations and identify the critical aircraft. Forecasts for commercial service airports will also include, at a minimum, passenger enplanements, while forecasts for general aviation airports will include the number and type of based aircraft. The aviation demand elements to be forecast are shown below in Figure 7-2.

Figure 7-2: Aviation Demand Elements

Required	Included Where Appropriate
Operations (annual) Itinerant Air Carrier Air Taxi and Commuter (Regional) General Aviation Military Local General Aviation Military	 Domestic vs. International Annual Instrument Approaches IFR vs. VFR Operations Air Cargo Aircraft Operations Touch and Go Operations (Training) Helicopter Operations Average Load Factor Fuel Use
Passengers (annual) Enplanements Air Carrier Commuter Enplanements Originating Connecting	 Passenger and Cargo Data Domestic vs. International General Aviation Passengers Helicopter Air Taxi Other Number of Student Pilots Number of Hours Flown
Aircraft Based Aircraft Aircraft Mix Critical Aircraft	 Average Seats/Aircraft

b. **Term of Aviation Forecasts** – Prepare forecasts for short-, medium- and long-term periods and specify the existing and future critical aircraft. Short-term forecasts, for up to five years, are used to justify near-term development and support operational planning and environmental improvement programs. Medium-term forecasts (a 6- to 10-year time frame) are typically used in planning capital improvements and long-term forecasts (beyond 10 years) are helpful in general planning.

c. **Peak Period Forecasts** – Forecasts of annual aircraft operations or passenger activity may not adequately describe the needs of individual airport facilities. Because they average demand levels over the course of an entire year, annual metrics are only useful when activity tends to be evenly distributed over the hours, days, and months of a particular airport facility's operation. However, most airports have peak periods where demand far surpasses those averages. Stresses arising from activity peaks are critical at commercial service airports serving as hubs or that have substantial international traffic. Master plan forecasts must include appropriately defined peak period activity levels for facilities planning, such as terminal buildings and ground access systems.

703. FACTORS AFFECTING AVIATION ACTIVITY

Planners preparing forecasts of demand or updating existing forecasts should consider socioeconomic data, demographics, disposable income, geographic attributes, and external factors such as fuel costs and local attitudes towards aviation.

a. **Economic Characteristics** – The economic characteristics of a community will affect the demand for air traffic. In addition to national and regional economic activity, these include specific, identifiable, local activities that distinguish the geographic area served by the airport. The type of industry in an airport's service area also will affect aviation demand, with manufacturing and service industries tending to generate more aviation activity than resource industries such as mining.

b. **Demographic Characteristics** – The demographic characteristics of an area's population also affect the demand for aviation services. Demographic characteristics influence the level, composition, and growth of both local traffic and traffic from other areas. Factors such as leisure time and recreational activity are important in estimating activity, but can be difficult to measure. Another important demographic characteristic is the level of disposable income, usually measured on a per capita basis, which is a good indicator of the propensity to travel and general aviation aircraft purchases and use.

c. **Geographic Attributes** – The geographic distances between populations and centers of commerce within the airport's service area may have a direct bearing on the type and level of transportation demand. The existence of populations and centers of commerce beyond an airport's service area may indicate the need for additional airports that serve transportation demand. The physical characteristics of the area and the local climate may also be important, since they may stimulate holiday traffic and tourism. The role of the airport within the airport system and its relationship to other airports may also have an effect on the services that are demanded at the airport.

d. **Aviation-related Factors** – Business activity, changes in the aviation industry, and local aviation actions can markedly affect the demand for airport services. Business developments in the airline industry, such as consolidations, mergers, and new marketing agreements, can affect airline operations at a particular airport, while fractional ownership can affect others. Wider industry trends, such as the introduction of new low-fare service, the introduction of new classes of aircraft, and the growth or curtailment of airline hubbing, may also alter the level and pattern of demand. To the extent that such actions affect all aviation activity in a region or the country, their effects will be captured in the FAA's forecasts. If, however, only the demand at a particular airport is affected, appropriate adjustments should be made in that airport's forecast. Actions taken by local airport authorities, such as changes in user charges, ground access policies or their support services can also stimulate or hinder the demand for airport services. Investment decisions made as a result of the planning process itself can also produce change by removing physical constraints to airport growth, which should be reflected in the forecasts.

e. **Other Factors** – External factors may also influence the demand for airport services. These include economic actions such as fuel price changes, availability of aviation fuels, currency restrictions, and changes in the level and type of aviation taxes. Political developments, including rising international tensions, changes in the regulatory environment, and shifting attitudes toward the environmental impacts of aviation, may also impact future demand and should be considered in developing or updating airport forecasts.

704. STEPS IN THE FORECAST PROCESS

The forecast process for airport master plan studies consists of a series of basic steps that may vary from airport to airport, depending on the issues to be addressed and the level of effort required to develop the forecast. Steps in this process include the identification of parameters and measures to forecast, review of previous forecasts, determination of data needs, identification of data sources, collection of the data, selection of the forecast methods, preparation of the forecasts, and evaluation and documentation of the results.

Planners should refer to a report prepared by the FAA's Office of Aviation Policy and Plans (APO-110), *Forecasting Aviation Activity by Airport*, dated July 2001, to help them determine what approach to use. That report can be accessed at http://www.faa.gov/data_research/aviation_data_statistics/. The APO data systems web site, at http://www.apo.data.faa.gov, provides historical traffic counts, forecasts of aviation activity, and delay statistics. The forecast process can be summarized as follows:

a. **Identify Aviation Activity Measures** – The aviation activity measures that planners need to forecast are the level and type of activities that are likely to affect facility needs. For airfield planning, the most important activities are aircraft operations and the fleet mix, since these define the runway and taxiway requirements. As a general rule, plans for general aviation airports require forecasts of aircraft operations and based aircraft. Airports with commercial service require forecasts of aircraft operations, fleet mix, and passenger enplanements. Passenger levels are particularly important, since they determine the size of the terminal building and other important elements of airport infrastructure such as parking facilities and access roads. Planners should forecast instrument operations and instrument approaches, since these data will be needed if they expect to add or upgrade navigational aids and instrument landing systems. For some airports, additional forecast elements may be required, including peak hour operations and peak hour passenger flows.

b. **Review Previous Airport Forecasts** – Planners should review the latest published FAA Terminal Area Forecast for the study airport and any forecasts from an earlier master plan. Contact regional planning bodies and state aviation agencies to determine whether they have conducted airport system planning studies that included forecasts of demand for the study airport.

c. **Gather Data** – Determine what data are required to prepare the forecasts, identify the data sources, and collect historical and forecast data. What data to gather, and for what time period, will depend not only on the parameters to be forecast but also on what data are available from previous airport forecasts. In some cases, it may be necessary to conduct additional activity counts.

d. **Select Forecast Methods** – There are several appropriate methodologies and techniques for forecasting aviation activity at a specific airport. The selection and application of appropriate methodologies and techniques requires professional judgment. A forecast effort may involve a number of different techniques. The FAA report referenced above provides a detailed discussion of several forecasting techniques. The most common techniques include the following:

1) ***Regression Analysis*** – A statistical technique that ties aviation demand (dependent variables), such as enplanements, to economic measures (independent variables), such as population and income. Regression analysis should be restricted to relatively simple models with independent variables for which reliable forecasts are available.

2) ***Trend Analysis and Extrapolation*** – Typically uses the historical pattern of an activity and projects this trend into the future. This approach is useful where unusual local conditions differentiate the study airport from other airports in the region.

3) ***Market Share Analysis or Ratio Analysis*** – This technique assumes a top-down relationship between national, regional, and local forecasts. Local forecasts are a market share (percentage) of regional forecasts, which are a market share (percentage) of national forecasts. Historical market shares are calculated and used as a basis for projecting future market shares. This type of forecast is useful when the activity to be forecast has a constant share of a larger aggregate forecast.

4) ***Smoothing*** – A statistical technique applied to historical data, giving greater weight to the latest trend and conditions at the airport; it can be effective in generating short-term forecasts.

e. **Apply Forecast Methods and Evaluate Results** – After the list of activities to forecast has been identified, the appropriate forecast methods have been selected, and necessary data have been assembled, the actual forecasts can be prepared. If several methods are used to project specific aviation activities, they will probably produce different estimates. Therefore, an evaluation of the reasonableness of the results and their consistency with other forecasts should be conducted.

A useful procedure in such an evaluation is to prepare a time line showing both forecast results and historical trends. Similarly, one might compare the history and forecast for the airport with the FAA national history and forecast for the same activity parameter. If the comparison of the growth rates shows a significant difference, the planners must be able to explain it. Forecast results may also be evaluated by comparing them with other forecasts prepared for the airport, such as those contained in state or regional aviation system plans. One might also review the operational factors and events implicit in the forecast to determine if differing assumptions regarding those factors have affected the forecast results. For example, a constraint on operations associated with runway and apron limitations at the airport could affect the results. Therefore, it is useful to evaluate forecasts both with these constraints and with the constraints removed, i.e., a constrained and an unconstrained forecast.

If demand levels are likely to be particularly sensitive to one or more factors, the planner should estimate the impact of reasonable changes in the underlying assumptions about those factors. For example, if expected growth in aircraft operations is highly dependent on the continued operation of a fixed base operator (FBO) and there is a reasonable possibility that the FBO will close, the planner should estimate how much that closing would change the predicted demand. The planner should also examine general aviation hangar activity, including the airport hangar waiting list, and estimate how much increased hangar space would change predicted demand.

If the timing of important demand-generating factors (specific local or national events or activities resulting in an increased demand for aviation services) is uncertain, the forecaster can construct a time line showing the period of uncertainty, during which demand constraints or the diversion of traffic to another airport may be needed. In this respect, the actual number of operations or enplanements in any specific future year is less important than the certainty that a particular threshold will be reached during the planning period. This approach acknowledges that demand is expected to exceed the airport's capacity, but that there is a range of time (with a range of forecast error costs, i.e., costs in terms of delays and reduced service levels as a result of airport capacity not keeping up with aviation demand because of forecast inaccuracy) during which this problem needs to be considered.

When preparing forecasts for airports with declining activity, the forecast should identify the underlying cause for the decline, including a review of national and local trends. A sudden decrease in activity may be temporary, particularly if local income and population are steady or advancing. If the drop in activity takes place more gradually and is sustained, the decline is more likely to continue during the forecast period.

To document an expected upward trend in activity, planners should get letters of support from airlines, fixed base operators, or other users; information from the *Official Airline Guide*, general aviation associations, news articles that document changes at nearby airports, survey data for aircraft activity, and trend data for based aircraft. Such letters should state that the writers plan changes in their operations at the study airport.

Most forecasts should include a sensitivity analysis to measure likely variations in activity if the factors influencing activity change. One method of measuring the uncertainty in the forecast is to use a number of alternative assumptions in preparing it. The use of alternative scenarios should be discussed with FAA staff during master plan study scoping.

It is often useful to provide a range of activity forecasts, that is, to forecast a high level of activity as well as a lower level and to try to determine where within this range the most likely forecast will be found. If a plan uses scenario forecasting and other techniques that develop alternative projections, the airport sponsor can then provide the most likely forecast projections to the FAA for its approval. Having a range of forecast activity allows airport planners to develop flexibility in facilities to accommodate different activity levels.

It may also be useful to develop Planning Activity Levels (PALs) based on the forecast. PALs are selected activity levels that the planner believes may trigger the need for additional airport capacity or other development and may be used for analyzing the benefits of proposed development alternatives. They may also be used to establish thresholds for the implementation of airport development projects. The use of PALs focuses the airport sponsor and the public on the need to plan for aviation activity levels rather than specific timelines.

f. **Compare Forecast Results with the FAA's Terminal Area Forecasts** – Planners should compare their forecast results with those contained in the most recent Terminal

Area Forecast. To facilitate this comparison, the FAA recommends completing the template in Appendix C of the document titled *Forecasting Aviation Activity by Airport* (July 2001).

g. **Approval of the Forecasts** – The general requirement for FAA approval of the master plan study's forecasts is that they are supported by an acceptable forecasting analysis and are consistent with the TAF. Master plan forecasts for operations, based aircraft, and enplanements are considered to be consistent with the TAF if they meet the following criteria:

1) Large, Medium, and Small Hub Airports

a) Forecasts differ by less than 10 percent in the 5-year forecast and 15 percent in the 10-year period, or

b) Forecasts do not affect the timing or scale of an airport project.

2) Other Commercial Service Airports

a) Forecasts differ by less than 10 percent in the 5-year forecast and 15 percent in the 10-year period, or

b) Forecasts do not affect the timing or scale of an airport project, or

c) Forecasts do not affect the role of the airport as defined in the current version of FAA Order 5090.3, *Field Formulation of the National Plan of Integrated Airport Systems*.

3) General Aviation and Reliever Airports

Where the 5- or 10-year forecasts exceed 100,000 total annual operations or 100 based aircraft:

a) Forecasts differ by less than 10 percent in the 5-year forecast and 15 percent in the 10-year period, or

b) Forecasts do not affect the timing or scale of an airport project, or

c) Forecasts do not affect the role of the airport as defined in the current version of FAA Order 5090.3, *Field Formulation of the National Plan of Integrated Airport Systems*.

When the 5- or 10-year forecast is for less than 100,000 total annual operations or 100 based aircraft, the forecast does not need to be reviewed at FAA Headquarters, but the data should be provided to the FAA for the annual update of the TAF.

Further guidance on FAA review and approval of aviation forecasts is defined in a memorandum dated June 2008 that can be found at http://www.faa.gov/airports/planning_capacity/.

Any substantial differences between the master plan forecasts and the TAF must be resolved before moving onto subsequent parts of the master plan. If the planner expects the master plan forecasts to be inconsistent with the TAF for any reason, the FAA's Project Manager should be contacted early in the forecast development process to discuss the implications of the variance.

Locally prepared forecasts may contain a more detailed analysis of local economic conditions or development that is not considered in preparing the TAF. Therefore, airport sponsors should review the FAA's TAF for their airport on a regular basis and notify their FAA Planner/Planning Program Manager when they believe local conditions merit a revision to the TAF. When requesting a change to the TAF, the airport sponsor should provide reliable historical data and letters from individuals with the authority to affect operations, which document planned changes in operations.

705. DOCUMENTATION

Present the results of the forecast process and a description of the process itself as a separate chapter in the master plan report. The forecast chapter should contain extensive documentation. The level of detail provided should be sufficient to enable both the FAA to analyze the results, for planners to use them later in the planning and environmental process, and so the forecast can be adapted for future planning efforts.

The master plan report should summarize each forecast element, explain the forecast methods used, highlight significant assumptions, clearly and concisely present the forecast results, and provide an evaluation of the forecast. Tabulations of historical and forecast data should be included for each forecast element; graphical presentations of key time series and forecasts are usually helpful. FAA recommends completing the template of the report titled *Forecasting Aviation Activity by Airport* dated July 2001. Explanations should be provided if major variances from historic trends are forecast. For complicated forecasts, an appendix to the technical report should provide detailed documentation of the methodology.

706. SOURCE DATA

The following sources may provide assistance for planners in preparing forecasts for master plan studies:

a. **Terminal Area Forecasts** – The FAA's Terminal Area Forecast (TAF) contains historical data for at least the past 10 years and forecast data for the next 15 years. The TAF summary report for each airport includes, as appropriate: aircraft operations (landings and takeoffs, local and itinerant; total operations; and air carrier, commuter/air taxi, general aviation, and military operations), enplanements (total, air carrier and commuter), and total instrument operations. The TAF presumes an unconstrained demand for aviation services.

b. **National Forecasts** – The FAA's Office of Aviation Policy and Plans publishes two other major forecasts, the FAA Aerospace Forecasts and the FAA Long-Range Aerospace Forecasts. The FAA Aerospace Forecasts are estimates of national aviation demand for the next 12 years.

Figure 7-3: Sample Table from Terminal Area Forecast Summary Report

Summary of Enplanements and Airport Operations at FAA Towers and Contract Towers

Enplanements at Towered Airports

	Count	2003	2010	2020	Annual Compound Growth Rate 2003-2010	2010-2020
Large Hubs	33	460,486,763	623,735,048	832,432,922	4.43	2.93
Medium Hubs	35	113,930,143	146,148,406	191,273,310	3.62	2.73
Small Hubs	66	43,914,690	63,050,236	80,139,022	3.69	2.43
Non Hub Towers	351	17,122,217	19,602,930	23,380,002	1.95	1.78
Total	485	635,453,813	852,536,620	1,127,225,256	4.17	2.83

Operations at Towered Airports

	Count	2003	2010	2020	Annual Compound Growth Rate 2003-2010	2010-2020
Large Hubs	33	14,356,535	17,766,287	22,010,896	3.09	2.17
Medium Hubs	35	6,972,068	7,846,402	9,413,334	1.70	1.84
Small Hubs	66	8,217,052	8,788,618	9,838,151	0.97	1.13
Non Hub Towers	351	33,230,486	35,369,207	40,008,626	0.90	1.24
Total	485	62,776,141	69,770,514	81,271,007	1.52	1.54

Source: Terminal Area Forecast Summary Report, Fiscal Years 2004 – 2020, Prepared March 2005, U.S. Department of Transportation, Federal Aviation Administration, FAA-APO-05-1

c. **Historical Data** – The FAA's Air Traffic Activity Data System (ATADS) contains historical aviation operations data for operations at Air Route Traffic Control Centers and FAA- and contract-towered airports. Monthly and annual counts of aircraft operations and instrument operations by user group are available at the facility, state, regional, and national level. These data can also be accessed at the APO website.

d. **Historical Data at Non-towered Airports** – Estimating current activity at non-towered airports can be difficult. The traditional method of using operations data from a similar towered airport to estimate the activity at a non-towered airport has been found to be unreliable. Records of fuel sales at the non-towered airport may be a more reliable indicator. However, the most reliable method has been found to be using a relatively inexpensive acoustical aircraft activity counter to obtain a series of cluster samples systematically drawn throughout the year and estimating the annual activity from these samples. The samples not only provide information on total annual operations, but also on the seasonal variability and peaking characteristics of the activity. For further information on this subject, see Transportation Research Record 958: "Ford-Shirack Study," *Estimating Aircraft Activity at Non-towered Airports: Results of the Aircraft Activity Counter Demonstration Project*.

The characteristics of operations at a non-towered airport, such as whether the operations are local or itinerant and what type of aircraft are using the airport, are as important as the number of operations. Visual surveys to determine these and other observable

characteristics can be expensive. A statistical sample can greatly reduce the cost. In 1987, the Oregon Department of Transportation published the results of a study in which the characteristics of operations at non-towered airports were determined through statistical sampling. See *Statistical Sampling and Estimating Procedure for Aircraft Activity Characteristics*, Oregon Aeronautics Division, Oregon Department of Transportation, April 1987.

e. **State and Regional Airport System Planning Data** – State and regional airport system plans can provide information, direction, and policy guidance for airport master planners. An airport system plan (at least for all NPIAS airports) provides forecasts and describes the roles of the various airports in the area and the distribution of traffic among them.

f. **Socioeconomic Data** – Planners should use recognized sources of socioeconomic data available from local, regional, state, and federal planning organizations. Key data elements include population, employment, income, and other measures. If possible, data should be presented on an historical basis and projected into the future.

g. **Other Data Sources** – Additional sources of data that should be reviewed are the *Official Airline Guide (OAG)*, FAA Form 5010, Airport Master Record, and other existing studies or reports.

The local FAA Airports office can provide additional guidance on using forecasting tools, techniques, and methods. Whether the aviation forecasts are being prepared by the airport planning staff or by consultants, early consultation and periodic discussion with FAA airports and forecasting staff are encouraged. Such discussions are particularly important when planners are considering using significantly different forecast assumptions and methods in developing the basis for a specific airport master plan or where there are differences between existing forecasts. These early discussions will be especially useful when the forecasts indicate that federal grants for airport improvements at the study airport would be justified sooner than called for in the existing TAF.

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Chapter 8 Facility Requirements

801. GENERAL

a. Planners should determine what, if any, additional facilities will be required to accommodate forecast activity. This task begins with an assessment of the ability of existing facilities to meet current and future demand.

In some cases, the airport sponsor may decide that it is in the community's best interest for the airport not to continue to grow to accommodate forecast activity, or to accommodate forecast activity only up to a point. In these cases, the master plan should document this decision and indicate the probable consequences of the decision (e.g., demand will be capped, the demand will go unmet, or the demand will be diverted to another airport).

This analysis needs to clearly define the aviation problems and why the airport needs to resolve them. Findings supporting a problem, and the potential solutions to that problem, must be clearly documented. Planners should ensure that this needs analysis provides information sufficient to provide a basis for describing the purpose and need for proposed Federal actions. Care should be taken that the facility requirements are not so narrowly defined that they point to a single solution.

b. Although this AC provides guidance on the facilities commonly found at airports of all sizes, planners should limit their efforts to those elements that are applicable to the study airport. Preparation of an appropriate scope of work in the pre-planning process will ensure that both the airport sponsor and the planners understand what elements should be studied.

c. The requirements for new or expanded facilities reflect the unique circumstances of each airport, such as, but not limited to, the following:

1) Capacity shortfalls, which are commonly driven by growing demand.

2) Enhanced security requirements mandated by the Transportation Security Administration, including the flexibility to respond to changes in threat levels.

3) Updated standards developed and adopted by the FAA or other regulatory agencies, to correct existing non-standard conditions and eliminate existing modifications to standards. If there are approved modifications to standards, planners should review the reasoning that led to those adjustments. The facility requirements chapter should indicate if those deviations will continue or will be eliminated in the new master plan.

4) The airport sponsor's strategic vision for the airport. Such needs are typically associated with a sponsor's strategic business plan, mission statement, or similar plans that will require modification of the airport.

5) The outdated condition, arrangement, or functionality of existing facilities.

d. At some airports, planners can use simulation models to help determine facility requirements. For large airports, simulations can model major components of an airport, including the airfield system, airspace environment, passenger and baggage flows in the terminal, and ground access networks. For smaller airports, simulations can model usage projections, passenger flows, and other support requirements including fixed base operator, maintenance, flight school, and fuel support requirements.

e. Many of the significant improvements needed at an airport are actually driven by the demand level, not a time frame or a specific year. Therefore, planners should identify what demand levels will trigger the need for the expansion or improvement of a specific facility. In this way, the sponsor can monitor growth trends and expand the airport as demand warrants. (For a discussion of the use of Planning Activity Levels, see Section 704.e.)

f. The findings from capacity analyses and facility requirement determinations help develop alternatives that can best meet future demand. Since critical investment decisions will be based on these analyses, the planner, airport sponsor, and FAA should consider the cost of inadequate analysis in determining the level of effort and sophistication of the capacity and delay analyses. If the analyses are not sophisticated enough, development funds could be wasted on alternatives that do not meet future demand. On the other hand, planning funds can be wasted by capacity and delay analyses that are more sophisticated than they need to be. Future facility needs and investment are to be based on these analyses and it is critical that these analyses be adequate, supportable, and defendable. Therefore, the need for more refined analysis is an important consideration during master plan scope of work development.

802. EMERGING TRENDS

a. The aviation industry is always evolving, and these changes affect the size, quantity, and type of airport facilities needed to accommodate future demand. The FAA, airport management, and planning professionals must remain aware of changes that impact airport planning and development, some of which currently include:

1) Airline industry consolidation, changes in air service patterns, and aircraft fleet decision making.

2) The continued introduction of new generation aircraft, which may present airport-aircraft compatibility challenges for airports as some may need to adapt their airside and terminal facilities to accommodate longer and wider aircraft with greater seating capacity than the aircraft they replaced.

3) Transformation of the National Airspace System (NAS) by Next Generation Air Transportation System (NextGen) initiatives. NextGen is the FAA's plan for modernizing the national air transportation system. Airspace optimization and performance-based navigation are key components of NextGen. NextGen initiatives may affect airspace and airfield capacity, airfield and terminal area operations,

aircraft equipage requirements, and on- and off-airport obstruction management requirements. Airport master plans should consider the specific NextGen initiatives and related technologies and flight procedures that may be implemented over the planning horizon.

4) Enhancements in information technology that are enabling more data to be transferred faster, influencing everything from airline scheduling and weather planning to advances in self-service passenger processing such as ticketing and check-in. Terminal automation systems will affect both functional space requirements in the terminal building as well as space allocation among tenant airlines and others.

5) Greater focus on sustainability. In the master plan, the planner should identify or consider practices that will enhance the airport's overall sustainability. These may include initiatives that maximize linkages with public transportation to reduce private vehicle trips to the airport, promote recycling and waste minimization, increase energy efficiency (including the use of alternative energy sources), reduce airport-related emissions, facilitate airport-related community and economic development, and increase community engagement in the airport planning and development process. Specific sustainability goals and objectives and strategies or measures may be identified during the planning process.

b. Planners should examine emerging industry trends and identify those that may influence airport capacity and facility needs, bearing in mind that not all trends will affect all airports in the same manner (and some may not be affected at all). Where considerable uncertainty about future demand or the role of the airport exists, plans that can be implemented in phases or adapted to new industry requirements and demands will allow the airport to meet future needs in a timely and sustainable manner.

803. DESIGN HOUR DEMAND

a. For master plans, estimates of annual and peak-hour demand for airline passengers, aircraft operations, cargo, and vehicle trips should be used to identify future facility needs. Peaking characteristics can provide insight on seasonal and time-of-day variations in demand; failure to consider these characteristics can result in high congestion and low levels of service during peak hours.

b. In the U.S., the evaluation of peak-hour demand is often based on the peak hour of the average day of the peak month. This approach provides sufficient facility capacity for most days of the year, but recognizes there will be some very busy days that experience congestion, queues, and delays, and that it is important that facilities are neither under nor overbuilt. However, for some critical airport systems, the peak hour of the average day of the peak month can substantially understate the demand at peak times, resulting in unacceptable levels of service or overloading of systems to a point that may approach gridlock. Some components of the passenger terminal complex, such as baggage handling systems and security screening checkpoints, are particularly sensitive to this issue.

c. To address these problems, planners may wish to consider alternate methodologies for determining peak-hour demand, such as the percentile of busy hours throughout the year (for example, 90th or 95th percentile). A facility sized to meet such demands should have sufficient capacity and service levels during 90 percent or 95 percent of the hours throughout the year. The specific percentile will depend on the facility being evaluated, the desired level of service, and the unique demand characteristics of the study airport. Methodologies for calculating peak hour demand are further descripted in ACRP Report 82, *Preparing Peak Period and Operational Profiles – Guidebook.*

804. SECURITY CONSIDERATIONS

Security requirements have become very important in planning airport facilities. Planning for security early in the development process can produce designs that accommodate security requirements in a more efficient, less costly, and less intrusive manner. However, specific measures for implementing security requirements will vary in response to shifting threats, evolving technology, and the physical and operational circumstances of individual airports. Planners should meet with representatives of the Transportation Security Administration (TSA) early in the process and be familiar with the current versions of applicable documents, including TSA's *Recommended Security Guidelines for Airport Planning, Design, and Construction* and relevant sections of the Transportation Security Regulations (TSRs). Appendix B, Useful Reference Materials, has a list of applicable TSRs and other security-related publications.

Security requirements will vary depending on the role and service provided at the airport. The information contained in 49 CFR Part 1542, *Airport Security,* describes the security rules and requirements for commercial service airports. Operators of general aviation airports are encouraged to use the recommended guidelines in appropriate TSA publications discussing security at general aviation airports to enhance the security of their facilities. Both commercial service and general aviation airports are extremely diverse and appropriate security measures can be determined only after careful examination of an individual airport.

Terminal facilities also have extensive security requirements, particularly with regard to the location of passenger and baggage screening. Ground access facilities, such as roadways and parking structures, may be subject to security-based siting considerations, including terminal proximity limitations. Security requirements are also becoming an increasingly important element in planning air cargo and general aviation facilities.

805. AIRFIELD AND AIRSPACE REQUIREMENTS

The determination of airfield and airspace requirements includes an assessment of the airports' ability to handle forecast activity levels, analysis of its compliance with design and safety standards, and a determination of design standards for new facilities or the improvement of existing facilities.

FAA Advisory Circular 150/5300-13, *Airport Design*, is a key resource for the planner in virtually all analyses to determine airfield requirements and is frequently referenced in this chapter.

a. **Airfield Capacity Analysis** – Airfield capacity is expressed in terms of the number of aircraft operations that can be conducted in a given period of time. Capacity is most often expressed as annual capacity (or annual service volume) and hourly capacity (or throughput capacity) for a particular runway and taxiway configuration.

   At low activity airports, airfield capacity often exceeds the anticipated level of demand and only a minimal analysis is necessary. For airports with higher activity levels, several techniques for determining airfield capacity are available to airport planners. The methodology in FAA Advisory Circular 150/5060-5, *Airport Capacity and Delay*, commonly referred to as the "handbook methods," yields hourly capacities and annual service volumes (ASV) and permits the estimation of aircraft delay levels as demand approaches and exceeds the throughput capacity of each airfield configuration. The handbook methods are typically used for long range planning and the results should be discussed with FAA representatives.

   Although the handbook methodology is adequate for many master plans, congested airports may incur higher levels of delay than are typically used in the ASV definitions. ASVs may not be appropriate to use at airports with a 24-hour operation, such as late night cargo operations. For such airports, computer simulation modeling may be necessary to provide the depth of analysis necessary to support major airfield investment decisions. There is no universally adopted simulation tool that must be used in airfield capacity analyses. The FAA's Technical Center supports the simulation engine for the most current version of the FAA Airport and Airspace Simulation Model, which is available to the public free of charge. Both public domain software and proprietary software developed by the private sector are also available for modeling. If simulation modeling is employed, planners must be careful to explain modeling capabilities and limitations, and review key assumptions, inputs, operating configurations and results with appropriate representatives of the FAA.

   Aircraft operational delay costs or savings are often used as the measure for comparing various airfield development alternatives. Delay is typically expressed in minutes per aircraft operation, which can be translated into hours of annual delay and easily converted into dollar estimates to be used as a basis for comparison. Traditionally, four to six minutes of average delay per aircraft operation is used in ASV calculation. This can be considered as an acceptable level of delay. When the average annual delays per aircraft operation reaches four to six minutes, the airport is approaching its practical capacity and is generally considered congested.

   The selection of a particular airfield capacity analysis technique should be made in the pre-planning phase of the master plan study. The selected technique should be clearly defined in the negotiated scope of work. At the conclusion of the airfield capacity analysis, planners will have a sense of whether an additional runway or taxiway should be included in the alternatives analysis.

b. **Runway Requirements** – Existing and future runways should be examined with respect to dimensional criteria, orientation, length, width, and pavement design strength:

1) ***Dimensional Criteria*** – FAA guidance on dimensional standards is based on a coding system known as the Runway Design Code (RDC). This system is used to relate critical design criteria to the operational and physical characteristics of the aircraft that will utilize a runway. Existing and future RDC classifications are determined from a review of the aviation demand forecasts and an understanding of the airport's existing and future role in the air transportation system. While the RDC classification is assigned to a specific runway, it is appropriate to apply a less demanding RDC to other runways that will not be used by the primary critical aircraft. See FAA AC 150/5300-13, *Airport Design*, for more information on appropriate RDC codes and dimensional criteria requirements.

2) ***Orientation*** – Runway orientation is primarily a function of wind coverage requirements for the existing and projected aircraft fleet mix. Historical wind and weather data can be obtained from the National Oceanic and Atmospheric Administration (NOAA). This analysis is used to determine if additional runways are needed to provide the necessary wind coverage. See FAA AC 150/5300-13, *Airport Design,* for guidance on wind coverage analysis techniques.

   Planners should also review runway designation. Periodic changes in magnetic declination may necessitate renumbering the runways. A declination calculator can be found at http://www.ngdc.noaa.gov/seg/geomag/jsp/Declination.jsp. The existence of obstructions and environmental and physical features, either man-made or natural, in approach and departure routes should also be considered in determining runway orientation.

3) ***Length*** – The length of a runway is a function of many factors, the most notable of which are the selection of an appropriate design aircraft and the longest nonstop distance to be flown by the design aircraft from the airport. Aircraft-specific runway length requirements are a function of aircraft physical characteristics at time of flight, weather conditions, and runway conditions. See FAA AC 150/5325-4, *Runway Length Requirements for Airport Design,* for guidance on this analysis. Other common resources for runway length assessments are the aircraft characteristics information published by aircraft manufacturers, consultation with aircraft operators at the airport, and the FAA document, *Best Practices: Planning Airports for Business Jets*. Aircraft manufacturers may be able to provide airport-specific runway length requirements for their aircraft, especially at airports with severe conditions such as high temperatures or high airport elevations.

4) ***Width*** – The required width of a runway is a function of the approach minimums, airplane approach category, and airplane design group for the design aircraft using the runway and is discussed in FAA AC 150/5300-13, *Airport Design*.

5) ***Pavement Design Strength*** – What aircraft types and the critical aircraft expected to use the airport should be used to determine the required pavement design strength, or weight bearing capacity, of airfield surfaces. The required pavement design strength is an estimate based on average levels of activity, and is expressed in terms of aircraft landing gear type and geometry (i.e., load distribution). The pavement design strength is not the maximum allowable weight. Limited operations by heavier aircraft

than the critical aircraft may be permissible. Pavement design and load distribution assumptions can be found in FAA AC 150/5320-6, *Airport Pavement Design and Evaluation*.

c. **Taxiway Requirements** – The taxiway system must provide safe and efficient aircraft movement between the runways and the aprons that serve passenger terminals, cargo, and general aviation facilities. Planners must consider 'cockpit-over-centerline' as the taxiway method for safe and efficient taxiing throughout the airport.

1) The Taxiway Design Group (TDG) relates to the undercarriage dimensions of the aircraft. Taxiway width and fillet standards may require a specific runway to taxiway, and taxiway to taxiway/taxilane separation. Aircraft Design Group (ADG) separation criteria are based on aircraft wingspans and tail heights. ADG separation criteria is the minimum separation criteria for avoidance of collisions, however greater separation may be recommended based on TDG for efficiency in ground maneuvering. Planners should consider upgrading intersections designed using slower judgmental oversteer taxi method to accommodate cockpit-over-center line taxi. Advisory Circular AC 150/5300-13, Airport Design, provides specific fillet geometry to accommodate cockpit over centerline maneuvering at existing runway to taxiway and taxiway to taxiway/taxilane separations. It is appropriate for a series of taxiways on an airport to be planned to a different TDG than another based on expected use. As traffic increases, the taxiway system can become the limiting operational factor, especially if the airfield configuration results in frequent runway crossings by taxiing aircraft, or does not provide sufficient access or bypass capability. The location of taxiway exits may also reduce runway occupancy time, thereby increasing capacity.

2) Planners should re-examine intersections with more than three possible turns "three-node" intersection (see Taxiway Design, AC 150/5300-13), the location and type of runway exit/entrance taxiways as well as the location of parallel taxiways, crossover taxiways, bypass taxiways, perimeter taxiways, and holding pads. At congested airports, computer simulation can aid this analysis.

d. **Electronic, Visual, and Satellite Aids to Navigation** – Aids to navigation provide pilots with information to assist them in locating the airport and provide horizontal and/or vertical guidance during landing. Navigational aids also permit access to the airport during poor weather conditions. The need for new or additional navigational aids is a function of the fleet mix, the percentage of time that poor weather conditions are present, and the cost to users of not being able to use the airport when it is not accessible. Important navigational aids include instrument landing systems (ILS), approach lighting systems (ALS), Precision Approach Path Indicators (PAPI) or other visual approach slope indicators, and global positioning systems (GPS), such as the Wide Area Augmentation System (WAAS). Airport users can assist planners in identifying the need for navigational aids and the development of WAAS approaches. The installation of new navigational aids may require airspace coordination.

e. Air traffic control facilities include air surveillance radars, airport surface detection equipment, remote transmitters and receivers, wind shear detectors, weather observing

equipment, and others. The general siting of future air traffic control facilities should take place during the master plan process so that adequate space is reserved for them and their critical areas are protected from development that would interfere with their operation.

f. **Airspace Requirements** – For complex master plans, particularly for a commercial service airport located near another commercial service airport, determining airspace requirements may require a detailed investigation, often using computer simulations. Such efforts need to be carefully coordinated with FAA air traffic representatives so as to reach agreement regarding key modeling assumptions. In addition, if the airfield capacity analyses call for new runways or major airfield reconfigurations, significant airspace changes or redesign may be required and FAA air traffic representatives should participate in the discussions.

In most master plan studies, however, the focus will be on reviewing the airport's existing airspace classifications and determining if growth at the study airport or at neighboring airports could require an upgrade to a higher airspace classification.

At non-towered airports, the master plan should determine if the growth in aircraft operations will exceed threshold values for the establishment of an airport traffic control tower. For towered airports, line of sight investigations may reveal that the airport traffic control tower should be relocated. See FAA Order 6480.4, *Airport Traffic Control Tower Siting Criteria*, for help in making such a determination.

Planners should identify penetrations of imaginary surfaces (as defined in 14 CFR Part 77, *Objects Affecting Navigable Airspace)* to determine their disposition. Obstacle clearance surfaces associated with *United States Standard for Terminal Instrument Procedures (TERPS)*, and obstacle clearance requirements found in FAA AC 150/5300-13, *Airport Design*, should be evaluated as appropriate. In some cases, the TERPS surface may be the controlling airspace surface.

With the ongoing implementation of NextGen technologies and flight procedures including new approaches using Wide Area Augmentation Systems (WAAS), Localizer Performance with Vertical Guidance (LPV), and area navigation (RNAV) and Required Navigation Performance (RNP), the master plan should evaluate existing and potential future approach capabilities and include airspace obstruction analysis to ensure appropriate planning for existing and future approach procedures.

806. COMMERCIAL SERVICE PASSENGER TERMINAL COMPLEX

a. The commercial service passenger terminal complex extends from the aircraft parking positions on the airside interface to the vehicle curbside on the landside interface. The role of an airport in the national, state and regional air transportation systems will influence passenger terminal facility requirements. A major connecting hub, for example, will need terminals that are functionally different from those at an origin and destination airport. Similarly, airports serving major tourist destinations or business centers may have special needs.

The scope of analysis will be based on a number of factors, including but not limited to, the size and type of airport, available land, state of existing facilities, activity levels (passengers and aircraft operations), demographics of the passengers served, airport goals and objectives, and funding considerations. Planners should also consider the level of detail needed for the master plan. It may be appropriate to provide only the general location and footprint of a future terminal complex in the master plan, and complete a more extensive terminal requirements analysis in a separate study, especially if existing facilities will not accommodate future demand or industry requirements.

1) ***Airside Requirements*** –

a) Planners should identify the number and type of aircraft gates and parking positions that will be needed to accommodate future activity. The mix of aircraft expected to operate at the airport during the design hour will determine the linear feet of apron frontage and the gate dimensions. The location of aircraft parking positions relative to air traffic movement areas should be considered to avoid or limit the effects of aircraft pushbacks on aircraft taxiing flows. Aircraft gate requirements should include consideration of the functionality of jet bridges to serve the current and forecast aircraft fleet mix.

b) The availability of and need for remain-overnight (RON) aircraft parking should be evaluated. RON aircraft parking may be provided at aircraft gates or in proximity to the passenger terminal building or in remote locations (remote hardstands).

c) For airports that experience cold winter weather, deicing facilities should be evaluated.

d) The parking and storage of ground service equipment should also be considered in determining apron frontage requirements. Planners should strive to separate ground vehicle movement areas from aircraft movement areas as much as possible to ensure safety.

e) Some airports operators are exploring the possibility of accommodating commercial space activities, including the possibility of either horizontal or vertical launch capabilities as well as reentry activities.

In such cases, it is important for the airport planning process to consider a broad range of associated issues, particularly in order to prevent or minimize any potential impacts to the safety, efficiency or utility of the airport, including (but not limited to) airside facilities. The FAA will address associated issues in future guidance and policy documents, addressing not only airport planning but also environmental, financial, safety and compliance issues.

2) ***Passenger Terminal Building Requirements*** –

a) Within the terminal building, requirements are commonly expressed in terms of square footage for major functional elements, such as ticket counter/kiosk areas, security screening checkpoints, aircraft gates and holdroom/departure lounges, concessions, airline operations, baggage makeup, baggage claim, circulation, public space, restrooms, airport offices, and mechanical space. Airports that serve international flights also require facilities for customs and immigration. Planners should evaluate the special requirements for these facilities by referencing the latest guidance from U.S. Customs and Border Protection (CBP) and the Centers for Disease Control and Prevention (CDC).

b) Understanding the space requirements of these elements will assist planners in configuring the terminal complex. In master plans where terminal building expansion or reconfiguration may be recommended for the long term, it may be appropriate to provide only a general location and footprint of the future terminal building, rather than specific functional area requirements. Industry planning, design and level of service standards are often used to develop generalized gross terminal space requirements necessary to properly size the terminal footprint (refer to Section 806.c for relevant reference materials).

3) ***Landside Requirements*** –

a) The length of curbside area required is a function of the modal splits of originating and terminating passengers, pedestrian circulation, dwell time assumptions and occupancies for the vehicles at the curbside, and the assignment of different types of vehicles to the curbside. Airport sponsor policies regarding dwell time and other airport roadway management practices (including use of inner and outer and upper and lower level roadways and curbs for specific roadway users such as arriving and departing passengers, taxi/limousine, shared ride, hotel/parking/rental car shuttles, etc.) will influence curbside requirements. The availability of convenient, short-term parking within walking distance of the passenger terminal building, the availability of public transit, the extent of consolidation among the various door-to-door shuttles, and the use of cell-phone waiting areas or parking lots will reduce the amount of curbside area required.

b) To facilitate the flow of traffic in front of the terminal, the number of lanes should be assessed.

b. **Passenger Convenience and Access to Airport Facilities** – Section 131 of the FAA Modernization and Reform Act of 2012 (49 U.S.C. § 47101(g)(2)) requires airport master plans to consider passenger convenience, access to airport facilities, and ground access. In accordance with this provision, the following sections identify some of the considerations that an airport master plan may evaluate in order to improve the overall passenger experience – enhancing the passenger's sense of convenience and facilitating access to and from and through the airport complex. Section 810.i provides specific information on passenger convenience as it relates to ground access.

1) ***Passenger Convenience*** – Key measures of passenger convenience focus on passengers being processed in an efficient amount of time and with minimal imposition. Passenger convenience also may be evaluated in terms of comfort. It will be perceived differently by every passenger at every phase of travel, and is a function of a passenger's demographic characteristics, place of residence, trip purpose, and travel habits. Passengers with mobility and sensory impairments, language barriers, elderly travelers, families traveling with small children, and nursing mothers traveling on business may face more hurdles when traveling, leading to negative perceptions about convenience.

   Many aspects of the traveler's experience don't fall wholly within the direct control of the airport sponsor, and are influenced to a greater or lesser degree by airlines and other service providers at the airport. In 2009 and 2011, in response to a series of significant delays in which passengers were held on board aircraft for lengthy periods (and also in response to the high incidence of flight delays and other consumer problems), the U.S. Department of Transportation issued two final rules entitled Enhancing Airline Passenger Protections (74 FR 68983 and 76 FR 23109), which became effective on April 29, 2010, and August 23, 2011, respectively. These two rules put in place a number of consumer protection measures to "improve the air travel environment for consumers" (see Federal Register Notice dated April 25, 2011, announcing the Final Rule (https://federalregister.gov/a/E9-30615 and https://www.federalregister.gov/articles/2011/04/25/2011-9736/enhancing-airline-passenger-protections).

1) Even with these new consumer protection rules for air travelers, within the terminal complex, passengers often continue to experience long wait times or delays due to problems with facilities or staffing at key points in their journey (such as during the check-in and/or baggage drop-off process, at TSA or CBP checkpoints, at baggage claim, and at rental car facilities) or other inconveniences due to facility design (such as long unassisted walking distances, which often contribute to passenger complaints regarding their travel experience).

   Airports do, however, have a lot of influence over other aspects of the passenger experience including the overall balance between airside, landside and terminal facilities; airport signage and messaging systems; curbside management; various aspects of the airport concessions program; and decision making related to other facilities and amenities within the airport's public areas.

   a) As appropriate to the level of detail included in the overall terminal plan, planners should consider the basic types of services provided to travelers at various points within the terminal building, as well as the degree of congestion, waiting and processing times during each phase of the journey from airport curb to aircraft gate. Shorter wait times and walking distances, intuitive way finding, accessible and reliable flight information displays, and sufficient and accessible restrooms, and reasonable distribution of space for a variety of concessions, among other

considerations, may enhance the passengers' overall travel experience and contribute to a sense of convenience.

b) Providing amenities to make passenger wait-time more productive, comfortable or more entertaining may improve the passenger experience and perceptions of convenience. Amenities should be shown as appropriate to a level of detail to determine rough blocked-out areas for these functions. Examples include comfortable holdroom seating, dedicated work areas, accessible power connections, Wi-Fi, full-service restaurants, children's play areas, facilities for nursing mothers (such as lounges or non-bathroom spaces)[1], family restrooms, gym/fitness centers with shower facilities, library/reading rooms, public art and museum exhibits or displays, and entertainment options. The types of amenities offered by an airport in or in close proximity to their passenger terminal complex will vary greatly depending on the airport's passenger characteristics, airline composition, facility layout, and other factors.

c) Planners should also consider an appropriate balance of pre-security screening facilities and amenities for airport employees, airport visitors, and meeters and greeters. At a minimum, restroom requirements and at least limited concessions (such as a coffee kiosk and news and gift store) should be evaluated. The type and quantity of these pre-security screening amenities will depend on the characteristics of the airport and the local market.

d) Many publications describe common metrics and accepted standards for evaluating the passenger experience at an airport. Some of these publications are listed in Appendix B of this AC. Planners should consult the appropriate publications depending on the size and scope of the project. Airport surveys or comment kiosks can also be useful in determining the public's perception of the functionality and convenience of the terminal facility. Airport customer service representatives, airport passengers, airport duty managers and airline station managers, Travelers Aid agencies and the United Service Organization (USO) also provide valuable insight to improvements needed in terminal facilities.

2) ***Access to Airport Facilities*** – Access to airport facilities refers to the ease with which passengers can navigate and travel through the airport complex. Passengers should be able to access the airport's landside facilities and terminal building, and travel between each, in a seamless flow.

a) Planners should evaluate parking and curbside capacity and designated areas for travelers waiting for their next mode of transportation. Access to shuttles, buses, trains, and automated people movers (APM) where warranted should be evaluated, as well as the frequency of service relative to aircraft arrival and departure times.

[1] In addition to facilities for passengers, in accordance with Section 4207 of the Affordable Care Act (the Health Care Reform Act), many airports and airport employers are required to provide reasonable break time and a private, non-bathroom place for nursing mothers to express breast milk during the workday. These requirements became effective on March 23, 2010.

b) Inside the terminal building, planners should evaluate passenger pathways, vertical transitions, clarity of signage and wayfinding, space and queue lengths at check-in and security, space and wait times at baggage claim, access to airport information and airline schedules, and convenience of restrooms, concessions, and departure lounges.

c) Planners at international airports should evaluate CBP facilities where immigration and infectious diseases are addressed. This evaluation should include an assessment of passenger processing times to ensure that the facilities and associated staffing levels provide acceptable levels of service throughout the day. Coordination with CBP is important during the planning study and on an on-going basis to ensure that the facilities and staffing continue to meet the needs of the traveling public.

d) Access to airport facilities for people with disabilities, impairments, and limited mobility can be particularly challenging. Planners should evaluate whether airport facilities meet the Americans with Disabilities Act (ADA) and other building code requirements. Existing facilities that are in noncompliance with these requirements should be remedied as required by law. New facilities should be planned and designed to improve accessibility and convenience for all passengers while meeting the special needs of disabled passengers. The master plan should identify requirements for service animal relief areas within the terminal complex. AC 150/5360-14, Access to Airports by Individuals will Disabilities, should be consulted for additional guidance.

e) Planners should be cognizant of the specific needs of passengers using wheelchairs or other types of mobility assistance, and those with specific medical requirements. Planners should identify any specific terminal layout requirements, amenities (including concessions, information booths, medical clinics, and restroom facilities) and staffing considerations necessary to best accommodate these passengers and improve their travel experience.

c. **Methodologies** – Information on methodologies that can be used to determine passenger terminal facility requirements is provided in several sources, including:

1) FAA Advisory Circulars 150/5360-13, *Planning and Design Guidelines for Airport Terminal Facilities,* and 150/5360-9, *Planning and Design of Airport Terminal Facilities at Non-Hub Locations*

2) *Airport Development Reference Manual*, published by the International Air Transport Association

3) *ACRP Report 25, Airport Passenger Terminal Planning and Design, Volume 1: Guidebook* (http://www.trb.org/Publications/Blurbs/163252.aspx)

ACRP Report 25, Airport Passenger Terminal Planning and Design, Volume 2: Spreadsheet Models and User's Guide
(http://www.trb.org/Publications/Blurbs/163171.aspx)

4) *Recommended Security Guidelines for Airport Planning, Design and Construction*, published by the Transportation Security Administration (http://www.tsa.gov/sites/default/files/assets/pdf/airport_security_design_guidelines.pdf)

5) Proprietary computer simulation modeling tools can also be used to evaluate passenger and baggage flows through airport terminals.

Additional references are provided in Appendix B.

807. GENERAL AVIATION REQUIREMENTS

a. General aviation (GA) encompasses a variety of users and activities, such as corporate flight departments, cargo operators, recreational flyers, business commuters, flight training, agricultural applications, law enforcement, emergency medical services, firefighting, and fixed base operators (FBOs). As a result of the variety of GA aircraft activity, GA needs include aircraft storage facilities, transient parking aprons, terminal facilities, automobile parking areas, and vehicle access from adjacent roads. Planners should consult appropriate publications for specific information regarding GA airport facilities planning, such as FAA AC 150/5300-13, *Airport Design* and applicable ACRP reports.

1) ***Aircraft Storage Facilities*** – Physical requirements of GA users vary from tie-down aprons to large conventional hangars with major maintenance services and transient aircraft aprons. Conventional hangars and T-hangars protect aircraft from the weather and provide security against vandalism or theft. Planners should evaluate the demand for outdoor aircraft parking versus covered aircraft parking and storage facilities in t-hangars or enclosed hangars. The demand for enclosed hangars may be higher in areas of the country that experience extreme winter and summer weather conditions.

2) ***Transient Aircraft Parking Aprons*** – Temporary parking for visiting aircraft may be provided on a transient apron adjacent to the terminal building, or on aprons managed or leased by an FBO. Parking apron requirements should be based on the regular use needs of the airport.

3) ***Terminal Facilities*** – Terminal buildings at GA airports range from very modest structures with little more than a waiting room and a telephone to multistory buildings with extensive amenities, such as pilot briefing rooms and lounges, restaurants, gift shops, conference and training rooms, and rental car counters. At GA airports, the terminal building may also house administrative offices. At commercial service airports, general aviation terminal facilities are often provided by one or more FBOs. In such cases, the facilities are provided principally for customers of the FBO and access for the general public is limited.

b. Planners should analyze existing and forecast activity, including based aircraft activity and transient aircraft operations, and the types of users when assessing future facility requirements at GA airports. The role of the GA airport in the region as well as the also

may influence facility requirements. More information on evaluating airports as part of a system is provided in FAA AC 150/5070-7, *The Airport System Planning Process.*

c. Planners should be aware of factors that may influence existing demand for GA facilities. For example, if facilities are in disrepair compared with facilities at nearby airports with overlapping service areas, demand may shift from the study airport to the nearby airport. The airport sponsor's pricing policies may also affect demand. A useful barometer of facility needs, particularly short-term needs, is the existence of waiting lists for hangars, T-hangars, and aircraft tiedown positions.

d. Planners should carefully evaluate the existing and future GA aircraft fleet mix. Business jets have different facility and service requirements than single-engine aircraft.

e. Additionally, in accordance with (49 U.S.C. § 47101(g)(2)), passenger convenience considerations for GA facilities at commercial service airports and at GA airports include automobile parking, rental car facilities, aircraft parking (transient and long term), signage, comfort and cleanliness of FBO facilities, services such as aircraft maintenance and catering, and dedicated work areas for pilots.

808. AIR CARGO REQUIREMENTS

a. For commercial service airports and larger GA airports, air cargo activity is generated by a diverse collection of companies with differing business strategies and market roles, including the following:

1) ***Integrated Carriers***, which transport freight from door-to-door using their own fleet of trucks and aircraft.

2) ***Freight Forwarders***, which act as brokers that link shippers with freight carriers; they coordinate the shipment of freight, but do not transport it.

3) ***All-Cargo Operators***, which sell space to freight forwarders or individual companies and ship the air cargo on their aircraft.

4) ***Combination Carriers***, which carry both passengers and freight on a single aircraft, typically with a reconfigured cabin.

5) ***Belly Freight Carriers***, which carry cargo in the baggage compartment or belly of a passenger aircraft.

Airport planners should assess the capacity of existing cargo processing facilities and determine future requirements for buildings, aircraft parking aprons, and ground access facilities. Each type of cargo operation has somewhat different site requirements, so a range of spaces will need to be provided for cargo development. In planning for future air cargo facilities, planners should consider: (1) the existing air cargo market and demand at the airport including existing fleet mix and activity (operations and tonnage) and facilities (on- and off-airport office, warehousing and sorting facilities, truck/loading dock areas, airside apron and aircraft parking areas, and employee parking), (2) the type and number of cargo companies expected to expand or initiate

operations; (3) annual air cargo operations projected for all cargo operators; (4) the number of existing apron parking spaces; (5) projected growth in annual enplaned cargo tonnage; (6) the availability of ground access for the heavy commercial trucks associated with cargo activity; (7) the availability of ground access and parking for employees in air cargo facilities, and (8) any security needs and requirements. Planners should consider providing a means of separating cargo trucks from other airport traffic for security purposes.

b. At most GA airports, air cargo facilities are included in the broad category of general aviation facilities. Air-cargo-related activities are accommodated in the hangar, apron, and ground access facilities of the general aviation tenants and operators. In such cases, an independent analysis of air cargo needs is unnecessary.

809. SUPPORT FACILITIES

a. Support facilities at an airport encompass a broad range of functions that ensure the smooth, efficient, and safe operation of the airport. As applicable, the future requirements for the following support facilities should be assessed:

1) ***Aircraft Rescue and Firefighting*** – For airports that require 14 CFR Part 139 certification, planners should review the aircraft operations forecast to determine if the airport's Aircraft Rescue and Firefighting (ARFF) index will change during the planning period. If 14 CFR Part 139 certification is not currently provided at the study airport, but will be required during the planning period, the applicable ARFF building and equipment requirements should be defined in the master plan. See 14 CFR Part 139, *Certification of Airports*, particularly sections 139.315 through 139.319, for ARFF index definitions, and FAA AC 150/5210-15, *Aircraft Rescue and Firefighting Station Building Design*, for standards and guidance in planning an ARFF station. Planners should also consider if multiple ARFF stations will be required to meet response time requirements as defined in 14 CFR Part 139. For airports that do not require 14 CFR Part 139 certification, planners should identify any existing mutual aid agreements with local authorities for emergency response services, or the lack thereof.

2) ***Airport Maintenance*** – Airports provide a wide variety of services to ensure a a safe, efficient, and reliable environment for airport tenants and users. The facilities needed to support these services include administrative offices, buildings for storage and maintenance of airport equipment, shop space, and buildings for supply storage. Northern airports need equipment for snow removal operations (refer to FAA AC 150/5220-18A, *Buildings for Storage and Maintenance of Airport Snow and Ice Control Equipment and Materials).*

3) ***Fuel Storage*** – FBOs often provide fuel storage and supply at general aviation airports. At some airports, unattended self-service facilities may be provided when activity does not warrant full-time attendants. At commercial service airports, fuel storage facilities provide jet fuel if the supply through pipelines or tanker trucks is interrupted. To support general aviation, planners should address the types of approved aviation fuel needed to meet current and future public demand.

4) ***Aircraft Maintenance*** – For the general aviation community, aircraft maintenance is typically provided by an FBO. The types of services provided include, but are not limited to, airframe and power plant repair by an FAA-certified repair station. The facilities required to sustain these services include: (1) an aircraft maintenance hangar with sufficient work space for any aircraft upon which maintenance is being performed; (2) suitable storage and shop space for equipment and tools; (3) office space, customer lounge, restrooms, and telephone; (4) apron area with pavement type and strength adequate to support the expected aircraft fleet; (5) adequate automobile parking and ground access; and (6) proximity to the engine run-up area to limit taxiing times and fuel costs. At larger airports, a tenant airline may have established a maintenance base for the periodic inspection and maintenance of its aircraft. To determine the space requirements for such a maintenance facility, planners should ask airline representatives about the types of aircraft they plan to service at the airport and their expected facility needs.

5) ***Deicing*** – Airports in locations with winter weather conditions that can cause accumulation of frost, snow, slush, or ice on aircraft surfaces must have aircraft deicing facilities. These airports should consider deicing pads to maintain departure flow rates and avoid unacceptable aircraft delays. Any new aircraft deicing facility must have runoff mitigating structures to collect deicing fluid runoff, and must comply with U.S. Environmental Protection Agency (EPA) requirements. See FAA AC 150/5300-14B, *Design of Aircraft Deicing Facilities,* for standards and guidance in planning deicing facilities.

Guidance for assessing the future needs of aviation support facilities is provided in the referenced ACs. In many cases, planners may rely on interviews with airport management and airport tenants and users to better understand existing and future facility requirements..

810. GROUND ACCESS, CIRCULATION, AND PARKING REQUIREMENTS

One of the key elements in choosing a mode of travel to the airport is the total trip time between the passenger's point of origin and their destination. Travelers are particularly sensitive to the duration of the ground access portion of an air travel trip. The regional roadway network, on-airport circulation roadways, and parking facilities are the principal components of the ground access system. The capacity and reliability of this system will determine the levels of service and convenience provided to air travelers during the ground access segment of their trips.

a. **Regional Transportation Network and Public Transportation** – Coordination with local transportation planning agencies during the review of existing conditions should produce enough information to enable an assessment of ground access capability, and to confirm whether or not the existing and planned networks can accommodate projected aviation demand.

   At airports where the capacity of the airport ground access or regional roadway system may be a concern, discussions between the airport and local transportation planning agencies may help in identifying roadway capacity needs and potential roadway improvements or management techniques to improve roadway level of service and reduce congestion. At busy and complex airports, planners can benefit from the use of a variety

of analytical computer models and simulation models to evaluate existing conditions, analyze future scenarios, and consider alternative strategies to manage future airport roadway and curbside demand.

b. Larger commercial-service airports may implement strategies or policies to reduce the number of single-occupant private vehicle trips and to encourage greater use of high-occupancy vehicles. In major urban areas, the Metropolitan Planning Organization (MPO) or other regional planning agency may be able to provide assistance to airport planners. Where roadway congestion is determined to be a constraint, a separate ground access study may be required to identify near-term and long-term improvements or traffic management techniques to manage demand.

   Public transportation has the potential to reduce roadway congestion and the amount of land required for automobile parking while reducing total air pollutant emissions and other environmental impacts. Public transportation services, including scheduled bus and passenger rail, or other alternate modes of transportation, are often examined as part of an airport master plan.

   Airport plans (for new roadways, transit/rail corridors, and other transportation improvements) should be integrated into regional and state transportation plans to ensure that these long-range plans reflect future airport-related transportation improvements.

c. **On-Airport Circulation Roadways** – This roadway access system is shared by a wide range of users having different trip purposes, which include:

   1) ***Originating and terminating airline travelers*** who most often arrive at the airport in a private vehicle, but may also use a taxicab, limousine, courtesy bus, mass transit, charter bus, door-to-door shuttle, rental car, or bicycle.

   2) ***Employees*** who travel to and from the airport each day using private vehicles, public transportation, shuttles from remote parking facilities, or bicycles.

   3) ***Delivery vehicles*** that supply the goods and materials consumed or purchased at the airport.

   4) ***Other vehicles*** that may require access to air cargo facilities, general aviation facilities, support facilities, and other activity centers.

d. Each user group has a different pattern of arrival and departure times for its airport trips. Analytical methods and computer models may be used to evaluate roadway capacities and the levels of service they provide. Such analyses should also identify potential capacity increases in the form of additional lanes or operational modifications. Security provisions for vehicle screening may be required. Other users of the roadway facilities that should be evaluated may include:

   1) ***Taxicab/Limousine/Courtesy Shuttle Staging Areas*** – Locations where vehicles can be parked and dispatched as needed to pick up passengers at terminal curbsides. A

staging area is a critical resource at busy airports where terminal curbside space is scarce.

2) ***Rental Car Facilities*** – At smaller airports, the rental car ready and return parking spaces are often located in lots adjacent to the terminal building or in the public parking garage. At larger airports, ready and return spaces may be provided in a consolidated rental car facility or at remote locations that are accessed via courtesy shuttles or buses. Rental car operations also require space for cleaning, fueling, maintaining, and storing vehicles.

3) ***Courtesy Shuttles and Buses*** – Courtesy buses and other types of shuttles serving on- and off-airport rental car facilities, hotels, and parking facilities are major users of on-airport roadways. At the larger commercial service airports, courtesy vehicles are often allocated dedicated curbside space to pick up and drop off passengers.

4) ***Charter Bus Operations*** – Airports that are gateways to major tourist destinations may accommodate high volumes of charter bus operations. Cruise ships, for example, may impose extraordinary passenger surges on airport facilities when they use charter buses to transfer passengers between the airport terminal and the marine port.

e. **Public Parking Facilities** – Public parking facilities at general aviation airports are generally small surface lots located next to the terminal building, while parking facilities at commercial service airports range from surface lots next to the passenger terminal to a combination of structured parking facilities and surface lots for short-term hourly, daily, and long-term parkers. Close-in parking often includes separate areas for hourly and daily parking. At larger airports, remote parking facilities with shuttle bus service may need to be considered.

f. **Cell Phone Waiting Lots –** At many airports, cell phone lots for meeters and greeters of arriving passengers reduce the amount of recirculating traffic on airport roadways. These lots may include amenities such as flight information displays, restrooms and concessions depending on the volume of traffic to support such facilities.

g. **Employee Parking** – At small commercial service airports, parking for employees whose worksite is inside the commercial passenger terminal building can usually be accommodated in small surface lots near the terminal. At larger airports, however, public parking in surface lots or garages is often given higher priority over terminal area employee parking. In these cases, planners should evaluate existing and future employee parking requirements to determine the the need for terminal area employee parking and remote employee parking, and associated employee parking facility shuttle bus service requirements. Employee parking and ground transportation surveys provide useful data to aid in establishing future facility requirements.

h. **Bicycle Lanes and Racks/Storage** – Planners should evaluate the extent of bicycle use by passengers and employees within the airport complex to determine requirements for

bicycle lanes and bicycle storage (racks and storage lockers). Consider co-locating bicycle storage within transit and parking facilities.

i. **Ground Access Passenger Convenience Considerations** – Per 49 U.S.C. § 47101(g)(2), planners should examine the various components of the airport's ground access system (including roadways, curbside, ground transportation services, signage, and parking facilities) in terms of passenger convenience. Passengers that need to travel to and from an airport must select a mode of transportation for that travel, taking into account mode efficiency and comfort, cost of trip, duration of trip, vehicular traffic, complexity of routing, and potential impacts of road closures and accidents.

On the airport, signage should be simple, concise, and uniform to aid in wayfinding. At airports with multiple terminal facilities, roadway and curbside signage identifying airline locations is critical. Poor signage can reduce the level of service provided to airport patrons and result in increased recirculating traffic (refer to FAA AC 150/5360-12E, *Airport Signing and Graphics).* Passengers traveling by automobile will be most concerned with how easy it is to find parking, parking options and costs, signage and wayfinding to/from rental car facilities if renting a vehicle, and signage denoting airline terminal assignments. Variable or dynamic message signs may provide real-time information to passengers in the event of roadway closures, detours, or changes in airline terminal assignments or other facility locations that are not yet captured by the airport's signage system.

Good connectivity between an airport terminal and the various modes of transportation is essential. Public transportation options should be examined for frequency, travel time, cost, and number of segments (additional time required for connections), as well as type of intermodal facilities available on the airport to provide seamless and convenient connections for passengers on the next leg of their journeys. Walking distances to parking garages, frequency of shuttles to rental car facilities and nearby hotels on and off airport, and amount of curbside for vehicle staging should be examined for passengers not using public transportation.

811. UTILITIES

The master plan should address existing and future utility needs, such as for water, sanitary sewer, drainage and deicing, industrial waste, communications, power supply, and back-up power and water in case of emergencies. Existing systems should be evaluated and their capacity verified at the airport boundary. Historical ratios of utility demand to the level of enplanements or aircraft operations can form the basis for projecting future demand. Since an airport can be a large consumer of utility services, planners should discuss their projections with local utility providers to ensure that the airport's needs are included in their long-term service plans. Planners should also consult local building codes to ensure any specific local requirements are identified during the planning phase.

812. OTHER REQUIREMENTS

Many airports have significant acreage devoted to non-aeronautical uses, such as industrial parks, recreational uses, agricultural or grazing leases, or retail businesses. Some uses are considered temporary, to remain only until a higher aviation use materializes, while others are expected to remain as surplus to anticipated aviation needs. In either case, the revenue from these activities provides supplemental revenue to the airport and improve the airport's overall financial position. The planner should review the infrastructure needs of such activities and identify improvements that preserve the revenue-generating performance of a valuable asset.

813. DOCUMENTATION GUIDELINES

a. A stand-alone chapter of the technical report should describe the analyses and techniques used to determine future facility requirements. A summary at the beginning or end of the chapter and in the report's executive summary should highlight findings for key components.

b. Planners should use appendices to improve the readability and organizational flow of the documentation. However, they should avoid making the appendices a depository for unnecessary information, which can result in lengthy reports that may confuse and discourage the reader.

c. It is not necessary for the chapter documentation to mirror the outline of major sections provided in this chapter of the AC. However, it should follow the structure of the chapter of the technical report that describes existing conditions.

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Chapter 9 Alternatives Development and Evaluation

901. GENERAL

a. This chapter brings together many different elements of the planning process to identify and evaluate alternatives for meeting the needs of airport users as well as the strategic vision of the airport sponsor. Airports have a wide variety of development options, so an organized approach to identifying and evaluating alternative development options is essential for effective planning. The key elements of this process are:

1) Identification of alternative ways to address previously identified facility requirements.

2) Evaluation of the alternatives, individually and collectively, so that planners gain a thorough understanding of the strengths, weaknesses, and other implications of each.

3) Selection of the recommended alternative.

Planners should carefully organize the analysis because it is easy to consider alternatives that do not meet the airport's needs, or fail to consider certain long-term development options, particularly if one highly visible issue seems to overshadow other planning elements. Both of those outcomes can be avoided by the careful review of the scope of work, and by verifying that the facility requirements (including timing) are complete; that other considerations, such as the sponsor's strategic development objectives, unusual site or environmental consideration and other factors are documented and understood; and that there has been sufficient stakeholder participation.

b. Planners should also review the scope of work to ensure that the alternatives process conforms to the overall study design. In simple master plans, alternatives development may be limited. In these instances, facility improvements are simply an extension of existing land use patterns and can be best addressed in the Airport Layout Plan.

c. Planners should meet the airport's development needs in order to improve the airport as a system, while remaining responsive to environmental, fiscal, and other objectives. To do so, the planner must balance competing needs among the airport's various functional elements. Although the process varies by airport, planners typically consider the airside first; terminal, general aviation, and cargo facilities next; and then airport access. Since a master plan covers a 20-year time frame, planners should recognize that the recommended alternative should be functional through various stages of the plan. For example, it would not be a good idea to develop a new location for general aviation operations early on if the airside improvements needed to support it would not be provided until a later phase. A 20-year plan should also have the flexibility to meet unforeseen future conditions.

In some cases where it is appropriate to identify major development alternatives, such as a new runway, that meet demand beyond a 20-year time frame. For example, if an airport is experiencing urban encroachment that would lead to land use incompatibility,

planners should assess alternatives that would help protect aviation assets from that encroachment, or to plan for long-term land acquisition. However, planning beyond the 20-year period should be general in nature and in much less detail than that for the short- or even mid-term development. For example, if planning for a future runway, the master plan might only indicate the general location and potential length of the runway. The alternatives analysis would only consider key evaluation criteria and would be at a low level of detail.

d. Effective facility planning must consider environmental issues in the alternatives identification, evaluation, and selection effort. The early consideration of the potential environmental impacts of alternatives can avoid later problems. Some master planning efforts will produce short-term recommendations that will require an Environmental Assessment or Environmental Impact Statement. In these situations, the master plan must provide a good technical foundation for the subsequent environmental process. In some complex situations, it may be helpful to include an environmental consultant or FAA Airports Environmental Specialist as an advisor to the master plan. However, the planner should carefully review the master plan scope of work to avoid undertaking tasks better suited for the follow-on environmental analysis, such as wetland delineation or cultural resources surveys. To better understand how a master plan alternatives analysis fits within the overall development process, planners should concurrently review the following FAA guidance:

   1) FAA Order 5050.4, FAA Airports guidance for complying with NEPA,

   2) FAA Order 1050.1, *Environmental Impacts: Policies and Procedures*

   3) AC 150/5300-13, *Airport Design*

   4) Chapter 5 of this AC, *Consideration of Environmental Factors in Airport Master Planning*

   Master plans that address controversial undertakings, such as capacity projects at larger airports, should pay particular attention to environmental factors and the National Environmental Policy Act (NEPA) process during alternatives identification, analysis, and selection. The plan's environmental evaluation is intended to support the NEPA process. The planning and environmental review will be less likely to experience delays if the master plan supports the subsequent NEPA analysis.

   Although master planning is not part of the NEPA process, the master plan alternatives development and evaluation can provide an important component of an efficient NEPA process. In complex cases, the careful scope of work preparation (with assistance from an environmental consultant or FAA Airports Environmental Specialist) can ensure that the master plan provides information useful to subsequent environmental analyses under NEPA. Items of particular interest during planning include the types of reasonable alternatives that the sponsor and FAA can implement. The analysis of these alternatives must be consistent and well documented.

e. The alternatives effort should also consider fiscal issues. Planners must be aware of the practical fiscal limitations imposed on the airport by the availability of grant funds, passenger facility charges (PFCs), user fees and other sources of development dollars and their development options should reflect the fiscal capabilities of the airport. Cost should not be a factor in rejecting an alternative unless the cost of the alternative makes the alternative infeasible. A plan that is not realistic in terms of what can be funded will not provide much benefit to the sponsor or airport users. Note, however, that under NEPA, cost alone is not necessarily a valid reason for rejecting an alternative.

f. The alternatives identification, evaluation, and selection process should be the most collaborative portion of the master plan study as part of an effective public involvement program. The foundation for a successful effort in the alternatives analysis process is careful consideration of this task in the pre-planning activities. The level of detail to be undertaken in this task will greatly affect the cost of the master plan study.

902. ALTERNATIVES ANALYSIS PROCESS IN AIRPORT MASTER PLANNING

a. A general process of identifying, analyzing, and recommending alternatives is illustrated in Figure 9-1. The steps shown are an example of a comprehensive process that can be used on large and complex projects. For many airport planning projects, some of the steps may not be applicable. The process should be adapted to the needs of the study airport and the level of detail may vary considerably from study to study. The alternatives analysis process may be adapted in several ways, but variations should be clearly described in the study's scope of work; they may include changes such as:

1) What airport elements are included in the process

2) How the elements are ranked in the planning hierarchy

3) What type and level of analysis will be used to differentiate among the alternatives

b. Where a particular functional element does not exist, it can be eliminated from the alternatives analysis process; for example, planners need not consider an airline passenger terminal at general aviation airports. In addition, if there are no facility needs associated with a functional element, it is not appropriate to consider alternatives for that element. Thus, it is possible, if there are no facility improvements for primary elements and those for secondary elements are simply extensions of existing land use patterns, that the alternatives analysis process can be materially reduced or even skipped altogether.

c. The alternatives analysis process planning hierarchy that addresses the primary analysis first examines recommended alternatives for those elements that require large land areas and must be considered as a functional whole. For most airports, this will include the airside. For larger airports, airline passenger terminal and ground access elements may be included. For smaller airports, general aviation facilities may be included in the primary analysis.

The secondary analysis addresses elements that have greater planning flexibility, however, not all airport planning will have secondary analysis. For example, the support

facilities at some airports will include an Aircraft Rescue and Fire Fighting (ARFF) building. While an ARFF building will have specific size, location, and functional requirements, these requirements are significantly easier to satisfy than those for a new runway or passenger terminal.

The order of the elements in the planning hierarchy may vary by airport. For example, at an airport with particularly complex airside, airline passenger terminal, and cargo situations, but a very simple ground access element, the alternatives analysis process would be adapted to make the ground access element a secondary analysis element while making the cargo element a primary analysis element.

d. Planners may also adapt the analysis to the unique circumstances of the study airport. For example, an airport may have ample airfield capacity, but significant terminal and ground access congestion. In such a case, planners might conduct a relatively simple airfield capacity analysis, or none at all, while the airline passenger terminal and ground access elements would get a more intensive analysis, including computer simulation.

e. The alternatives analysis process is an iterative process, intended to be flexible enough to permit creative thinking about the future of the airport, but sufficiently structured to ensure consideration of all pertinent factors. The planner, in following this process, should focus on issues that shape how the airport will function as a system, as well as on narrower technical analyses.

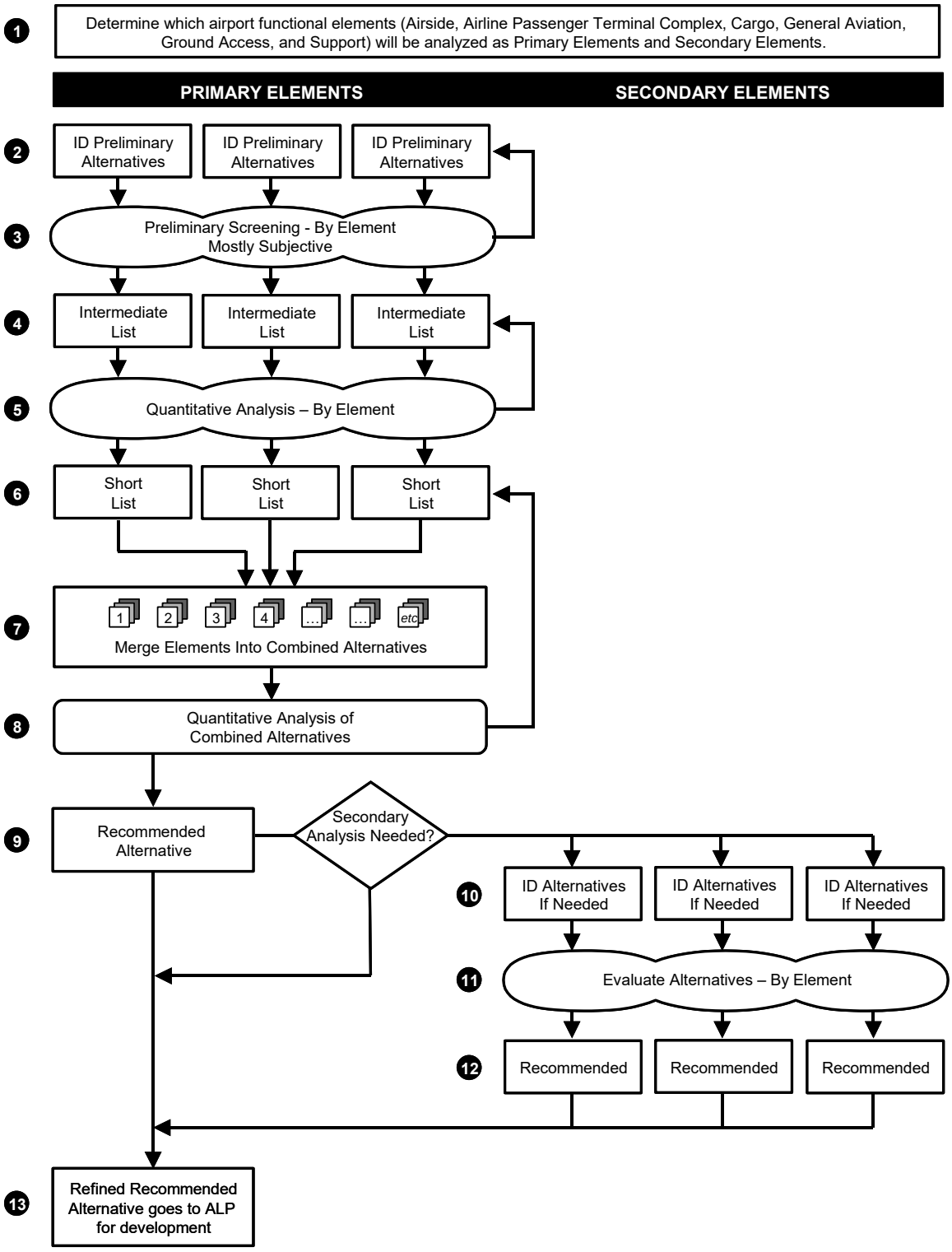
f. The alternatives analysis process should incorporate the public involvement program. Although the appropriate level of public involvement will vary, a meaningful involvement program is important and will provide a number of important benefits.

g. As shown in Figure 9-1, the alternatives analysis process should start with a broad group of alternatives for the primary elements and progressively screen them to produce reasonable alternatives that meet the planning need. The sponsor may identify a recommended single alternative.

1) ***Determine Primary and Secondary Elements (Step 1)*** – Determine which functional elements (airside, airline passenger terminal complex, cargo, general aviation, ground access, and support) should be considered in the primary analysis and which ones can be in the secondary analysis. Primary elements require large, contiguous land areas. Secondary elements have greater planning flexibility, can often be subdivided, and fill-in around the primary elements.

2) ***Identify Preliminary Primary Element Alternatives (Step 2)*** – After the principal elements for primary and secondary analysis are identified, select preliminary alternatives for the primary elements.

Figure 9-1: Alternatives Analysis Process Example



3) ***Screen Alternatives for Intermediate List of Primary Element Alternatives (Steps 3 and 4)*** – Screen the preliminary alternatives, using a mostly subjective, qualitative analysis, to make an intermediate list of alternatives. This screening will eliminate some alternatives for each of the primary elements, and may introduce others. Any subsequent environmental analysis will be aided by clear documentation of this screening, focusing on why alternatives were eliminated.

4) ***Quantitative Analysis for Short List of Primary Element Alternatives (Steps 5 and 6)*** – As appropriate, subject the selected alternatives to a more rigorous, and often quantitative, analysis to get a short list of alternatives by element. Again, clear documentation of this analysis will help in any subsequent environmental analysis.

5) ***Combine and Analyze Primary Element Alternatives (Steps 7 and 8)*** – Identify combined alternatives, consisting of the logical matching of the individual primary element alternatives, and subject them to a further analysis, based on previous work.

6) ***Select Preferred Primary Element Alternative (Step 9)*** – Select and document the recommended alternative for the primary elements. Note that subsequent environmental processing will materially benefit from clear documentation of this selection with a focus on why alternatives were eliminated.

7) ***Identify Alternatives for the Secondary Elements (Step 10)*** – Identify alternatives or options for the secondary elements. In some cases, the simplicity of the situation may eliminate the need for some or all of the secondary component alternatives.

8) ***Evaluate and Select Recommended Alternatives for Secondary Elements (Steps 11 and 12)*** – As appropriate, evaluate secondary elements alternatives, typically using a mix of qualitative and quantitative analysis, and select and document reasonable alternatives or options. Note that subsequent environmental processing will materially benefit from clear documentation of this analysis. It provides a focus on why some alternatives were eliminated and why reasonable alternatives were retained for consideration and environmental analyses.

9) ***Prepare Refined Recommended Alternative (Step 13)*** – The final step in the process is the combination of the recommended alternatives for the primary and secondary elements.

h. During the alternatives analysis process, planners will get new information and input that will help refine the alternatives or result in the introduction of new alternatives. Therefore, planners should view the alternatives analysis process as an iterative one.

903. IDENTIFICATION OF ALTERNATIVES

a. The alternatives identification (steps 2 and 10 in Figure 9-1) should consider only those alternatives meeting the sponsor's planning need and that the FAA or the airport sponsor will be able to implement. Planners should examine each identified alternative's technical feasibility, economic and fiscal soundness, and aeronautical utility (i.e., build and operated safely). Alternatives not meeting those criteria should be dismissed, while

providing reasons for their respective dismissals. The master plan should include reasons why planners rejected any alternative that would avoid environmentally sensitive resources or that would require extensive mitigation. This planning information is critically important to efficient project development. It is also critical to streamlining the subsequent NEPA process, since that process must consider the above master plan alternatives and those outside the FAA's or sponsor's jurisdiction.

b. To avoid an unnecessarily complex alternatives analysis process, the planner should carefully select different ways of addressing the identified need that are not simply variations on the same basic approach. Alternatives should have discrete, measurable, and materially different impacts on the established alternative evaluation criteria. Early work should consider a number of ideas, but these should be reduced to a manageable number of true alternative approaches through the initial steps of the process, taking care to adequately document what concepts were examined and why certain ones were dismissed. The need to work with a manageable number of alternatives in the master plan must be balanced with NEPA requirements to consider all reasonable planning alternatives to avoid or minimize impacts to environmental resources.

   Planners should understand the condition of the airport, the business relationships between the airport and tenants, the future vision of the airport sponsor, the environmentally sensitive features of the airport, and other factors that make each airport unique.

c. There should be a direct link between the facility requirements and the development alternatives. Not all facility requirements are related to capacity shortfalls, as some will improve operations, comply with standards, or meet the sponsor's strategic objectives. However, the basis for all facility requirements should be clearly documented.

d. The alternatives should address those airport elements that are the focus of the particular master plan (airside, airline passenger terminal, or ground access) and de-emphasize functional elements that are less important to the airport's overall function.

e. The process of identifying alternatives should be iterative. It should begin with the identification of a broad range of possibilities, often generated by using a collaborative brainstorming approach. The focus should be on the primary elements. The elements should be reviewed to ensure that necessary interrelationships are considered (i.e., make sure there is a ground access option and airside option that supports each terminal option). The elements may conflict (i.e., a terminal option may conflict with an airside option). Initial screening should narrow the range of possibilities to those reasonable alternatives that meet the planning need for each element, which will then undergo more intensive development and evaluation.

f. As the alternatives are evaluated, planners may need to apply more specialized skills. In some cases, they may need to conduct airspace reviews to determine an alternative's aeronautical utility. In very complex cases, they may need to conduct preliminary engineering studies and prepare cost estimates.

g. In many cases, the secondary element may not require the formulation and analysis of alternatives, but may be integrated directly into the recommended primary element alternative. This is particularly true when the secondary element can follow an extension of an existing land use pattern and no environmental resources are affected.

904. EVALUATION OF ALTERNATIVES

The evaluation of alternatives (steps 3, 5, 8 and 11 in Figure 9-1) should be adapted to each airport's unique situation. Sophisticated and expensive analyses should be done only when deemed necessary to differentiate among alternatives. In all cases, the analysis should follow generally accepted planning practices, be replicable, consistently applied, and well documented.

The alternatives analysis process uses increasing levels of detail as the evaluation of alternatives proceeds. The initial rounds of evaluation should be qualitative and more subjective, based on a combination of good planning judgment, relatively simple-to-use models and simplified calculations. However, subsequent rounds of analysis should be more rigorous.

Evaluation criteria should be determined in advance, but may be adjusted based on information uncovered as part of the alternatives analysis process. Since the selection of appropriate evaluation criteria involves a significant degree of subjectivity, planners must be careful to achieve a balanced evaluation, while still being responsive to the various study participants' points of view. The planner must carefully consider factors of particular importance at the study airport, but make sure that the evaluation addresses all aspects of the alternatives. Therefore, the planner should include a broad range of evaluation criteria to ensure the adequate consideration of all aspects of the alternatives.

Evaluation criteria are divided into four broad categories: operational performance, best planning tenets and other factors, environmental factors, and fiscal factors. For most airports with relatively straightforward planning issues, a simple analysis across a broad range of evaluation categories will be sufficient. The following evaluation criteria should be adapted for each airport to achieve a balance between the need for a thorough evaluation and the inefficiency of over-analysis:

a. **Operational Performance** – How well the airport functions as a system can be evaluated from several perspectives, including capacity, capability, and efficiency.

   1) ***Capacity*** – Test for the capability of accommodating future activity levels. Various capacity techniques can be applied to the airside, terminal, and ground access elements. Consistent application of the technique to each alternative will permit the planner to compare them.

   2) ***Capability*** – Test for the capability of meeting specific functional objectives, such as accommodating the design aircraft, providing the required number of aircraft parking positions or gates, or allowing space for the runway length requirement.

   3) ***Efficiency*** – Test how well the alternatives work as a system by examining combined alternative elements. For example, airfield taxiing efficiency can be evaluated by

combining terminal and airside alternatives to measure which combination yields the lowest weighted average aircraft taxiing time and the fewest runway crossings.

Several FAA offices have a role in assessing the aeronautical utility of various alternatives. These include the FAA's Air Traffic Organization (generally the terminal, technical operations, and planning units), Flight Procedures, and Flight Standards. Questions to be addressed may include the feasibility of approach procedures, navigational aid siting, and airspace interaction.

b. **Best Planning Tenets and Other Factors** – Planners should determine the relative strengths and weaknesses of the alternatives. The following best planning tenets will apply to the evaluation of alternatives at most airports, but others may be applicable at a specific airport:

1) Conforms to best practices for safety and security

2) Conforms to the intent of applicable FAA design standards and other appropriate planning guidelines

3) Provides for the highest and best on- and off-airport land use

4) Allows for forecast growth throughout the planning period

5) Provides for growth beyond the planning horizon, as applicable

6) Provides balance (typically capacity) between elements

7) Provides the flexibility to adjust to unforeseen changes

8) Conforms to the airport sponsor's strategic vision

9) Conforms to appropriate local, regional, and state transportation plans and other applicable plans

10) Technically feasible (limited site constraints)

11) Socially and politically feasible

12) Satisfies user needs

c. **Environmental Factors** – The potential environmental effects of the alternatives are an important consideration. The impact categories defined in FAA Order 1050.1, *Environmental Impacts: Policies and Procedures* and FAA Order 5050.4, FAA Airports guidance for complying with NEPA, offer significant insight about the likely impacts of various alternatives. At some airports, only a few of the items will be applicable, such as noise, wetlands, or social impacts and a simple approach will be sufficient to differentiate among the alternatives. Where an Environmental Assessment or Environmental Impact Statement is likely to be prepared, a more detailed evaluation of environmental factors will be useful. An environmental consultant may provide significant insight in such cases.

Early consideration of the environmental effects of the alternatives can help ensure that they remain responsive to the overall environmental objectives of the airport sponsor. If early examination indicates that the principal alternatives are likely to have extensive environmental effects, it may be appropriate to develop additional alternatives. If there are no additional alternatives, the decision to move forward with the existing alternatives should be made only after careful consideration by the airport sponsor.

d. **Fiscal Factors** – Preparing rough cost estimates is a very effective way to compare alternatives and should be done in all alternatives analyses. Cost estimates should account for any special differences among alternatives. For example, in comparing a green-field site versus the redevelopment of an existing site, the evaluation should consider the respective cost advantages and disadvantages. A green-field site might have cost premiums associated with site work, installation of support infrastructure, and access roadways. At the same time, redevelopment might have cost premiums associated with demolition, phasing, and relocations.

Early fiscal analysis may also be necessary to determine if the alternatives are responsive to the fiscal constraints of the study airport. The identification of likely funding sources and their funding potential are important factors in determining the feasibility of the alternatives. If early estimates indicate that the principal alternatives are beyond the realistic fiscal capability of the airport, planners should include that information in the master plan and develop more fiscally responsible alternatives.

Planners may also prepare a preliminary benefit-cost analysis, following the current benefit/cost analysis guidance from the FAA Office of Airports. However, for most alternatives reviews, a summary analysis using reasonable estimates and judgment will be sufficient. Planners should conduct any required benefit-cost analyses in accordance with FAA guidelines when the development and financing plans are sufficiently refined to allow a more accurate estimate of the costs, benefits, and other factors.

905. SELECTION OF A RECOMMENDED ALTERNATIVE

a. The selection of an airport sponsor's recommended alternative (steps 9 and 12 in Figure 9-1) will usually be based on a combination of efforts, including: summation of the alternative evaluation criteria, supplemental analyses and evaluations, stakeholder input through the public involvement process, and sponsor preferences. The level of complexity of the selection process typically reflects the complexity of the airport's situation. However, in all cases the reasons for the selection of the recommended alternative should be clearly documented.

b. Summation of the alternative evaluation criteria can take many forms. Because this effort typically relies heavily on the judgment of the planning team, particular care must be taken to ensure that the summation process is clear and understood by the airport sponsor and study participants. In simple situations with relatively few evaluation criteria, a recommended alternative can often be selected with little or no summation of the evaluation criteria. In more complex settings, a matrix of findings can be effective in selecting a recommended alternative. In addition, a matrix of findings can document

matters of judgment; facilitate the sponsor's, the FAA's, and others' participation in the decision making process; and build consensus regarding the recommended alternative.

In master plans that are controversial or will lead to an Environmental Assessment or that may require an Environmental Impact Statement, the planner should ensure that the process used to select a recommended alternative is comprehensive, logical, well documented, and has meaningful public participation. The public involvement process during a master plan serves an important function, but it does not replace the public involvement process required by NEPA and described in FAA Order 1050.1, *Environmental Impacts: Policies and Procedures* and FAA Order 5050.4, FAA Airports guidance for complying with NEPA. If the master plan contains short-term development projects that are known to require additional environmental processing, the airport sponsor should consider beginning the environmental processing prior to selecting a recommended alternative. Selecting a recommended alternative prior to beginning the environmental processing may complicate the NEPA process because the various agencies and public involved may perceive that the NEPA analysis is biased.

906. AIRPORT SITE SELECTION

The emphasis in airport planning is normally on the expansion and improvement of existing airports. Sometimes, however, an existing airport cannot be expanded to meet the future demand and a new or supplemental airport is required. In these cases, a new airport site may be selected as part of the airport planning process. The process of identifying, evaluating, and selecting a potential site for a new airport is similar to the process of identifying, evaluating, and selecting alternatives for individual airport projects. Appendix E contains guidance on the airport site selection process. If planners want to use Federal financial assistance under the AIP for follow-on planning or site acquisition and development, the FAA must approve the selected site before any additional planning work is started.

907. DOCUMENTATION GUIDELINES

a. The documentation of the alternatives identification, evaluation, and selection process should be a separate chapter in the master plan technical report. The planner should provide a summary at the beginning of the chapter that describes the recommended alternative and its principal benefits.

b. Planners should move technical information to appendices to improve the readability and organizational flow of the documentation.

c. Since this documentation may be heavily relied upon in a subsequent Environmental Assessment or Environmental Impact Statement, the planner should ensure that the documentation is logical and thorough. It should make clear what alternatives were considered, why particular alternatives were eliminated from further consideration, and why the recommended alternative was selected.

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Chapter 10 Airport Layout Plans

1001. GENERAL

a. This chapter provides guidance for the preparation of the drawings that make up the Airport Layout Plan (ALP) drawing set. The ALP depicts existing airport facilities and proposed developments as determined from the planners' review of the aviation activity forecasts, facility requirements, and alternatives analysis. The process outlined in this chapter also applies to ALPs that are prepared without a master plan.

b. FAA Order 5100.38, *Airport Improvement Program Handbook*, provides supplemental guidance for the preparation of an ALP. United States Code (USC) 47107(a) requires, in part, a current ALP approved by both the sponsor and FAA prior to the approval of an airport development project. USC 47107(a)(16) requires that the airport sponsor maintain an ALP that ensures the safety, utility and efficiency of the airport. Grant assurance number 29 requires that the sponsor keep the ALP up to date at all times. As stated in Order 5100.38, an ALP remains current for a five-year period, or longer, unless major changes at the airport are made or planned.

c. The minimum elements of the ALP drawing set are defined in Appendix F, *Airport Layout Plan,* of this AC. This chapter complements the ALP drawing set requirements in Appendix F.

d. The ALP preparer must work closely with the airport sponsor, the responsible FAA office, and if appropriate, the applicable state agency, to define the requirements, standards, and criteria to be employed. To ensure that the ALP is comprehensive, all parties must agree to its content and standards. ARP Standard Operating Procedure (ARP SOP) 2.00, FAA Review and Approval of Airport Layout Plans (ALPs), and ARP SOP 3.00, FAA Review of Exhibit 'A' Airport Property Inventory Maps, should be referenced for specific ALP review and approval procedures and additional preparation guidance. Current versions of these SOPs are located at http://www.faa.gov/airports/resources/sops/.

e. The five primary functions of the ALP that define its purpose are:

1) An ALP creates a blueprint for airport development by depicting proposed facility improvements. The ALP provides a guideline by which the airport sponsor can ensure that development maintains airport design standards and safety requirements, and is consistent with airport and community land use plans.

2) The ALP is a public document that serves as a record of aeronautical requirements, both present and future, and as a reference for community deliberations on land use proposals and budget resource planning.

3) The approved ALP enables the airport sponsor and the FAA to plan for facility improvements at the airport. It also allows the FAA to anticipate budgetary and

procedural needs. The approved ALP will also allow the FAA to protect the airspace required for facility or approach procedure improvements.

4) The ALP can be a working tool for the airport sponsor, including its development and maintenance staff.

5) An approved ALP is necessary for the airport to receive financial assistance under the terms of the Airport and Airway Improvement Act of 1982, as amended, and to be able to impose and use Passenger Facility Charges. An airport must keep its ALP current and follow that plan, because those are grant assurance requirements of the AIP and previous airport development programs, including the 1970 Airport Development Aid Program (ADAP) and Federal Aid Airports Program (FAAP) of 1946, as amended.

f. The ALP drawing set is a set of planning drawings and is not intended to provide design engineering accuracy. Individual items such as runway coordinates, obstruction survey data, and application of airport design standards must comply with Federal survey standards. The ALP preparer will need to define accuracy requirements for specific elements of the ALP in cooperation with the airport sponsor and approving agencies.

g. Airport Layout Plans are prepared either as first time ALPs, formal revisions based on changes to the airport, or informal revisions based on minor improvements to the airport. Informal revisions, often referred to as pen-and-ink revisions, can be made to individual sheets of the ALP drawing set, although the responsibility for review and approval must still be coordinated with the FAA. These and other requirements are discussed in FAA Order 5100.38, *Airport Improvement Program Handbook*.

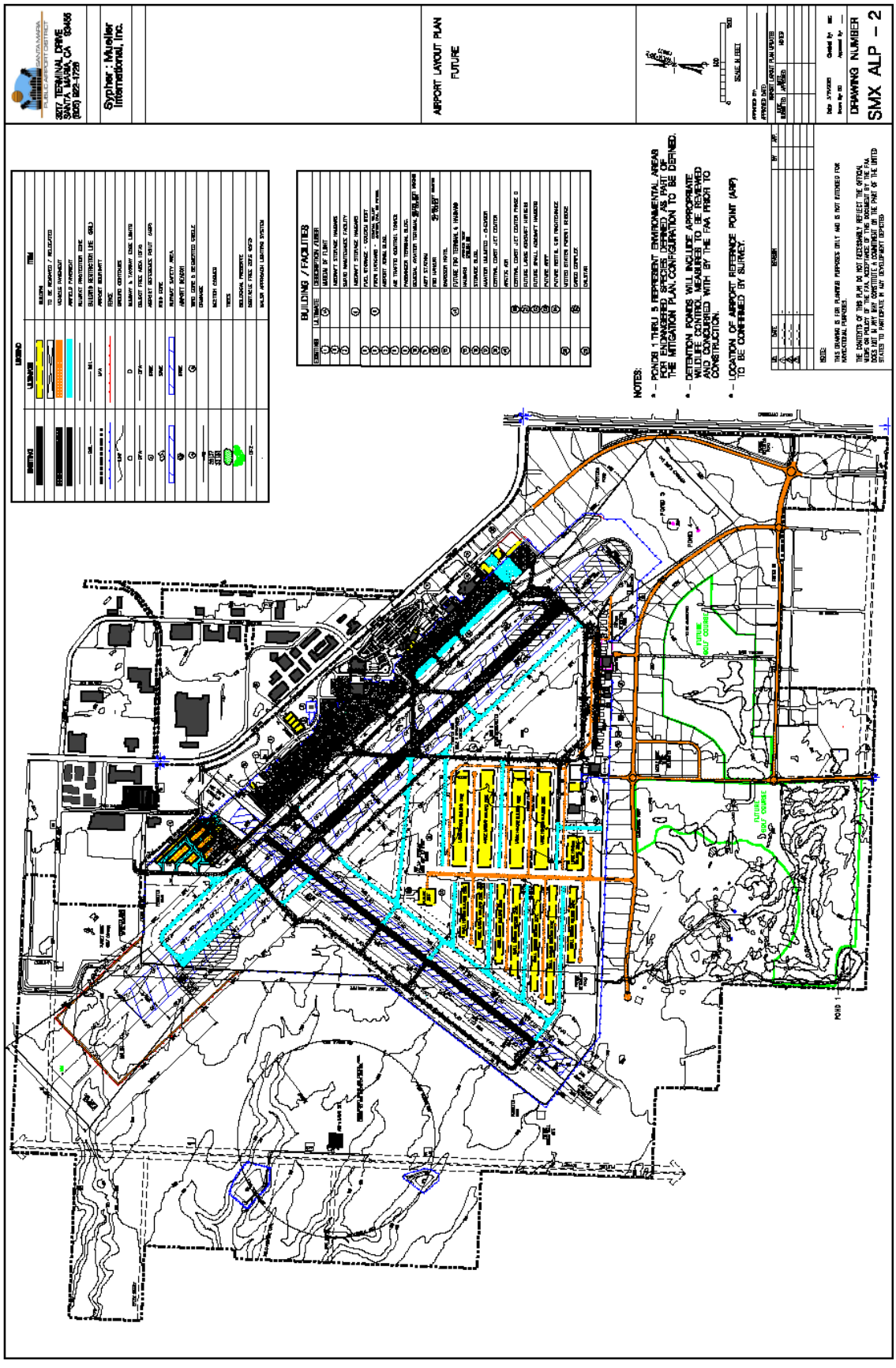
1002. AIRPORT LAYOUT PLAN DRAWING SET

a. The individual sheets that comprise the Airport Layout Plan drawing set will vary with each planning effort. The ALP preparer, airport sponsor, FAA and any other approving agency must determine which sheets are necessary during the project scoping activities. ARP SOP 2.00, Appendix A, ALP Review Checklist, may be used to guide the scope development. The following sheets are described further in the SOP:

1) ***Cover Sheet*** – A separate cover sheet, with approval signature blocks, airport location maps, and other pertinent information as required by the local FAA Airports office.

2) ***Airport Layout Plan*** –A drawing depicting the existing and future airport facilities. The drawing should include the depiction of all applicable design standards contained in the latest version of Advisory Circular 150/5300-13, including but not limited to, landing areas, movement areas and aircraft parking areas (e.g., runways, taxiways, helipads, aprons, etc.), required facility identifications, description labels, imaginary surfaces, Runway Protection Zones, Runway and Taxiway Safety Areas, Runway and Taxiway Object Free Areas, Runway Obstacle Free Zones and basic airport and runway data tables. It may be necessary to include the data tables on a separate sheet. Figure 10-1 is an example of an ALP drawing.

Figure 10-1: Airport Layout Plan Drawing



Source: Santa Maria Airport (SMX), prepared by Sypher:Mueller.
Note: This is a draft airport layout plan and has not yet been reviewed or approved by FAA.

3) ***Data Sheet*** – A separate sheet containing basic airport and runway data tables.

4) ***Facilities Layout Plan*** – A drawing that depicts existing and future facilities, and only critical, non-overlapping clearance criteria, with minimal text. It is essentially a simplified ALP.

5) ***Terminal Area Plan(s)*** – This plan consists of one or more drawings that present a large-scale depiction of areas with significant terminal facility development. Such a drawing is typically an enlargement of a portion of the ALP. At a commercial service airport, the drawing would include the passenger terminal area, but might also include general aviation facilities and cargo facilities.

6) ***Airport Airspace Drawing*** –14 CFR Part 77, *Objects Affecting Navigable Airspace*, defines this as a drawing depicting obstacle identification surfaces for the full extent of all airport development. It should also depict airspace obstructions for the portions of the surfaces excluded from the Inner Portion of the Approach Surface Drawing.

7) ***Inner Portion of the Approach Surface Drawing*** –Drawings containing the plan and profile view of the inner portion of the approach surface to the runway and a tabular listing of all surface penetrations. The drawing will depict the obstacle identification approach surfaces contained in 14 CFR Part 77, *Objects Affecting Navigable Airspace*. The drawing may also depict other approach surfaces, including the threshold-siting surface, those surfaces associated with United States Standards for Instrument Procedures (TERPS), or those required by the local FAA office or state agency. The extent of the approach surface and the number of airspace obstructions shown may restrict each sheet to only one runway end or approach.

8) ***On-Airport Land Use Drawing*** – A drawing depicting the land uses within the airport property boundary.

9) ***Off-Airport Land Use Drawing*** – A drawing depicting land uses and zoning in the area around the airport. At a minimum, the drawing must contain land within the DNL 65 db noise contour and to the extents of the future RPZs, if they extend beyond the airport property. For general aviation airports or low activity commercial service airports, where noise issues are less important, on-airport land use and off-airport land use drawings may be combined.

10) ***Airport Property Map*** – A drawing depicting the airport property boundary, the various tracts of land that were acquired to develop the airport, and the method of acquisition. This drawing is only required for those airports that have acquired land with Federal funds or through an FAA-administered land transfer program; however, it may be useful to all airport sponsors. If any obligations were incurred as a result of obtaining property or an interest therein, they should be noted. Obligations that stem from Federal grant or an FAA-administered land transfer program, such as surplus property programs, should also be noted. The drawing should also depict easements beyond the airport boundary. An airport property map is not a substitute for an Exhibit A unless it is prepared in accordance with AC 150/5100-17, *Land Acquisition and Relocation Assistance for Airport Improvement Program Assisted Projects.*

11) ***Runway Departure Surface Drawing*** – This drawing depicts the applicable departure surfaces as defined in Table 3-2 and Figure 3-4 in FAA AC 150/5300-13. The surfaces are shown for runway end(s) designated primarily for instrument departures. The one-engine inoperative (OEI) obstacle identification surface (OIS) should be shown for departure runway end(s) supporting air carrier operations.

12) ***Utility Drawing*** – This drawing depicts the location and capacity of major utilities on the airport and in the surrounding area.

13) ***Airport Access Plans*** – If access to the airport is a significant issue, a separate airport access drawing should be created, depicting the major routes of various modes of transportation that serve the airport. Such a drawing could also include proposed improvements to the system.

14) ***Other Plan(s)*** – Drawings that address a specific, unique need at the airport. For example, these drawings may include a Well Site Plan for on-airport oil and gas extraction, or a Launch Site Boundary for commercial spaceport facilities[2], etc.. The sponsor, FAA and other approving agencies must discuss and agree to include them.

1003. COMPUTER-AIDED DESIGN STANDARDS

a. ALP drawings may be produced electronically using design software. The sponsor and responsible reviewing agency will select what program to use. Design standards should be established and may include defined line types, line weight/thickness, lettering styles, symbols, and file-naming conventions. The sponsor, FAA and/or state agency must determine which standards must be followed in development of the Airport Layout Plan drawing set.

b. Following computer design standards will facilitate the review and approval of the drawings by the responsible agency, reduce the chance of someone misunderstanding the drawings, produce drawings that are useful for the reviewing agency and the airport sponsor, and produce drawings that may be used in subsequent planning and design efforts.

1004. GEOGRAPHIC INFORMATION SYSTEMS APPLICATIONS

a. Geographic Information Systems (GIS) allows users to visualize, question, analyze, interpret, and understand data to reveal relationships, patterns, and trends. GIS may be used by the airport sponsor for a number of purposes, including the inventory and maintenance of airport facilities, preparation for emergency services, planning for airport improvements, the inventory of airport property, and the inventory of sensitive environmental areas.

b. The ALP may be linked to an existing GIS or the airport sponsor may implement a new GIS incorporating the ALP. Airports are required to submit digital geospatial data in

[2] See FAA's publication entitled "Proposed commercial space facilities and operations at Federally-obligated or Part 139 airports," dated October 20, 2014, available online at http://www.faa.gov/airports/airport_safety/

conformance with the most current version of AC 150/5300-18, *General Guidance and Specifications for Submission of Aeronautical Surveys to NGS: Field Data Collection and Geographic Information System (GIS) Standards*.

1005. BASE MAPPING AND DATA SOURCES

Base mapping and data source issues should be discussed as part of the master plan scoping, since they may affect not only the ALP drawings, but also subsequent environmental matters. These issues might include the following:

a. **Base Mapping** – The level of detail required for the base mapping of the ALP must be determined by the airport sponsor, FAA, state agency, and the ALP preparer. Although some sponsors may already have the necessary data, new base mapping will often be required. Base mapping is typically done at the outset of the planning effort and is used in the facility requirements determination and alternatives analysis and selection. Since these processes ultimately establish the total area that will be depicted on the drawings, the preparer should establish the area that must be mapped by considering the following:

- Potential airport expansion beyond the existing boundaries
- The extent of noise contours
- Location of other potential environmental impact areas
- The area required to address ground access issues
- The area to be depicted on the Approach Surface Drawing
- Implications of the use of GIS

The ALP preparer will need to determine, based on topography, budget, and future uses of the base mapping, what intervals of topographical contours to use on the maps. Topographic issues may be important in the alternatives analysis, which may require that reduced contour intervals be used. The ALP preparer should also consider how to analyze airspace obstructions and violations. If aerial photogrammetry is used for the obstruction analysis, mapping can be paired with it, but parameters for both products must be established.

b. **Airspace Obstruction Identification and Analysis** – An assessment of airspace obstructions near the airport should be included on the Approach and Departure Surfaces Drawings and the Airspace Drawing. The ALP preparer and reviewing agency must establish data sources and parameters for this assessment. Obstruction data sources include airport obstruction removal programs, previous obstruction survey data, the airport's Obstruction Chart, and the FAA Digital Obstacle File. Numerous methods may be used for inventorying new obstructions or for verification of identified obstructions, including a physical site survey using traditional methods, aerial photogrammetry; and laser mapping. Obstruction analysis parameters include the extent of the approach surfaces to be surveyed and analyzed, and the survey of areas off the sides of the runways. Existing obstruction clearing and maintenance programs at the airport may minimize the need for extensive obstruction surveying. Conversely, development of a new airport, construction of new runways, and the extension, reclassification, or approach procedure revisions to existing runways may require additional surveying. Surveys should be done in accordance with FAA Advisory Circulars 150/5300-16, 17, and 18.

c. **Off-Airport Property** – The airport property map will identify the parcels that were acquired to develop the airport. The airport alternatives analysis may benefit from an inventory of parcels surrounding the airport boundary, particularly in areas of anticipated airport development. Being able to identify these parcels by size and use may also benefit potential subsequent environmental studies. The ALP preparer, the responsible agency, and airport sponsor should determine if expanding the property map to include these areas is necessary.

1006. CHECKLISTS

a. ARP SOP 2.00, Standard Procedure for FAA Review and Approval of Airport Layout Plans (ALPs) should be referenced for the most current ALP Checklist for use in scoping the ALP and managing the ALP review and approval process. This SOP replaces earlier checklists provided by individual Regions and District Offices.

b. For airports not included in the NPIAS, the FAA's checklist may not apply; states may have separate requirements.

c. Planners must verify that the ALP checklist is current, since it is continually revised to reflect changing Federal and state standards.

d. Once the applicable checklist has been identified, the ALP preparer should consult with the reviewing agencies to define the specific items on the checklist that are applicable to the project. The checklist is comprehensive and not all items are applicable to a specific project.

1007. APPROVALS

a. The ALP drawing set approval process may vary, depending on the requirements of the state aviation agency. The airport sponsor, FAA, state, and ALP preparer need to identify a review and approval process at the outset of ALP preparation.

b. FAA Order 5100.38, *Airport Improvement Program Handbook*, states that FAA review and coordination of the ALP will cover Federal interests and must consider any required coordination that was not completed at the local or state level.

c. The review of the Airport Layout Plan drawing set will typically be completed through multiple submittals. Milestones must be determined by the reviewing agency, but typically include:

1) ***Preliminary ALP submittal*** – The drawing set should be submitted to the sponsor for review and comment to ensure that the graphic depictions correctly present the sponsor's goals.

2) ***Draft ALP Submittal*** – The drawing set and support documentation should be submitted to the FAA and state aviation agencies for review and comment. Supporting documentation will include the ALP checklist and must be predetermined

with reviewing agencies. Review comments may be addressed prior to submittal of the Draft ALP drawing set for airspace review.

3) ***Draft ALP Airspace submittal*** – The Draft ALP drawing set should be submitted to the reviewing agency for distribution to various FAA offices for airspace review. As noted above, in some cases the FAA or state may require that the Draft ALP drawing set be submitted for review and comment and then resubmitted for airspace review after their comments have been addressed. In other cases, the FAA may conduct the airspace review at the same time as its general review of the Draft ALP drawing set.

4) ***Final ALP submittal*** – The ALP drawing set should be revised, as needed, based on the airspace determination and review comments if these were not addressed prior to submitting the Draft ALP drawing set for airspace review. The final ALP drawing set and accompanying narrative (Master Plan Report or ALP Narrative Report) should be sent to the reviewing agency for distribution.

d. Conditional Approval – The FAA may approve the ALP drawing set conditionally, based on specific components that will be subject to further review and approvals prior to funding and implementation. See Chapter 5 for additional information regarding master plan environmental review and ALP approval.

e. Unconditional Approval – The FAA may unconditionally approve the ALP drawing set when all proposed development projects are either categorically excluded from additional environmental processing, have received a Finding of No Significant Impact resulting from an Environmental Assessment, or have received a Record of Decision resulting from an Environmental Impact Statement.

1008. DOCUMENTATION GUIDELINES

a. The requirements for documentation of the ALP drawing set must be determined with the airport sponsor and the reviewing agency or State agency. Documentation will typically include a complete reduced-size set of the ALP drawing set and the accompanying text. The master plan will provide the narrative if the ALP is prepared as part of a master plan. If the ALP is prepared separately as an ALP Update, an ALP narrative is required. The narrative will typically describe ALP development criteria and the rationale for the development shown on the ALP. Examples of these include airport reference code-related design criteria unique to specific areas of the airfield, or known or proposed modifications to FAA design standards. (See Section 202.c of this AC for further guidance on the ALP Narrative Report.)

b. The quantity and form of ALP drawing sets must also be defined by the airport sponsor, FAA and state agencies. A reproducible, signed original copy and multiple paper copies of the drawings set may be required. Distribution requirements should be established during the project scoping.

c. Electronic files of the Airport Layout Plan drawing set may be prepared. These files are typically provided to the reviewing agency and may also be provided to the sponsor.

d. Once approved by the sponsor and approving agency, the ALP becomes a legal document and the sponsor should consider placing security controls on the ALP drawing set to prevent unauthorized changes to the drawings.

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Chapter 11 Facilities Implementation Plan

1101. GENERAL

a. The facilities implementation plan provides guidance on how to implement the findings and recommendations of the planning effort. Facility implementation plans will vary considerably, depending on the complexity of the projects and the airport sponsor's preferences. In some cases, a simple schedule, listing of key projects, project descriptions, timing of key activities, estimated development cost, interrelated projects, and any special considerations will be sufficient. Other situations may warrant a detailed implementation plan that includes a comprehensive master schedule for the implementation of the major projects, a detailed coordination plan outlining key activities and responsibilities, and detailed project descriptions in the form of project data sheets or project booklets for each major project. In all cases, an implementation plan should provide the airport sponsor and FAA with the information they will need to integrate the master plan's recommendations with the daily activities of the airport.

The airport sponsor, FAA, and other involved parties may use similar terms to describe somewhat different components of the facility implementation plan, particularly in regard to what makes up a Capital Improvement Plan (CIP). Airport sponsors maintain a "capital improvement program" or a "capital improvement plan" that includes all of their airport planning and development projects, both eligible and ineligible for AIP funding. The FAA considers actual funding requests through the Airports Capital Improvement Plan (ACIP) process.

Regardless of the terms used, the facilities implementation plan must address all of the airport's planned capital projects (even those projects that are not associated with the recommendations of the master plan) to ensure that adequate fiscal, staff, scheduling, and other resources are available. In addition, all documentation should be prepared so that it will be clearly understood by all parties.

The facilities implementation plan must balance funding constraints; project sequencing limitations; environmental processing requirements; agency and tenant approvals and coordination processes; business issues, such as leases and property acquisition; and sponsor preferences. The plan must also be coordinated with the master plan ALP and the airport's financial plan.

The facilities implementation plan may change from year to year in response to changing conditions. Therefore, the facility implementation plan should be prepared so that it is easy to update after the master plan is completed. For example, future aviation activity may grow more quickly than the initial facilities implementation plan anticipated, requiring modification of the plan to allow earlier implementation of projects. It should be more detailed in its early years than in the later years to reflect the imprecise nature of long-range facility planning.

1102. FORMULATION OF THE CAPITAL IMPROVEMENT PLAN

a. A new or revised Capital Improvement Plan (CIP) is a key element of the facility implementation plan. The projects illustrated on the ALP should be more precisely described in the sponsor's CIP. While the ALP illustrates facility improvements for broad time periods, (5, 10, and 20 years), those descriptions must be refined into specific projects for the CIP. The airport sponsor will then be able to integrate the master plan projects into its overall program of facility improvement projects, repair projects and maintenance projects. In some cases, planners may need to significantly revise the sponsor's existing CIP if it includes projects that are no longer relevant to the airport's development as a result of changes in the master plan. At large airports, where there may be many ongoing development projects, it can be difficult to integrate the projects identified in the master plan into the sponsor's existing CIP. The planner should work with the sponsor to define ongoing projects with regard to schedule, scope, and sources and uses of funds in order to integrate the master plan projects into a realistic CIP.

b. Given the wide variability in project descriptions and CIP processes, the planner needs to understand the requirements of the sponsor, FAA, and other applicable agencies before undertaking this task. Effective coordination among the planner, FAA, and the sponsor is essential. The airport's CIP contains all projects including those that may not be reflected in the FAA's planning module of SOAR. The level of detail in the sponsor's CIP may also vary considerably, depending on the complexity of the study airport and sponsor preference.

   Specific projects, based on the ALP, should be divided into smaller projects that reflect how projects are approved, designed, and constructed. Planners should maintain an appropriate project scope in designing individual projects. For example, if the master plan recommends the extension of a runway, the project would include extending the runway, as well as associated projects such as extending the parallel taxiway and adding associated navigational aids, electrical systems, and service roadways. However, if the master plan recommends the relocation of a passenger terminal, the subsequent projects associated with that could be extensive in themselves, including projects to address access roadway modifications, terminal area parking, terminal curb and roadway, terminal building and concourse, terminal apron, access taxiways, and miscellaneous support infrastructure. In all cases, however, the standard descriptions outlined in the SOAR planning module should be used for projects submitted to the FAA for funding consideration. Each component of an overall project should be described. For example, the land acquisition that is part of a runway extension should be described as "Extend Runway – Land Acquisition, Phase 1."

   Specific projects can be described as project listings on a master table, on individual project data sheets, or in projects booklets. The approach used will vary with the level of detail needed to support the sponsor's needs. Project descriptions may include the following types of information:

   - Project identification (name and project number)
   - Project scope (detailed project description and illustrations)
   - Concise project purpose or objective (why the project is needed)

- Project schedule (begin/end dates for pre-design, design, construction, close out, and start-up)
- Prerequisites, dependent, and interrelated projects
- Project budget (construction cost estimate, including quantities and unit costs, soft costs, and contingencies)
- Environmental processing required
- Funding information (AIP grant and PFC estimates, other funding source),
- Special considerations (lease considerations, property acquisition requirements, known environmental mitigation requirements, and site constraints)
- Identification of responsibilities (key activities and when they must be completed, by agency, organization, position, or person)
- Benefit/cost information (see Chapter 12 for a discussion of the FAA's *Airport Benefit Cost Analysis Guidance*)

1103. PROJECT SEQUENCING AND THE COMPREHENSIVE MASTER SCHEDULE

a. Airport projects may be complex, so the implementation plan should consider the interrelationships among the projects in the sponsor's existing and revised CIP. Planners should examine all projects to establish interrelationships, determine a sequence to minimize conflicts, and establish a master schedule to ensure the sequence is maintained throughout the implementation plan.

The facility implementation plan should cover the same years as the forecasts in the planning effort. Typically, detailed information should be provided for the five-year horizon, with less detail provided for the longer planning periods.

In addition to the technical aspects of designing and constructing the projects, the project sequencing plan or master schedule should reflect the sponsor's overall financial, environmental, and strategic plans. Developing the project-sequencing plan is an iterative process and may result in the reformulation of projects or revisions to the airport's financial, environmental, and strategic plans.

Since activity rarely grows exactly as forecast in the master plan, establishing triggers for key improvements, such as an aircraft apron expansion, additional aircraft storage hangars, or additional runway capacity, is recommended to allow a sponsor to respond to actual activity levels as they occur. The project-sequencing plan should document these triggers along with the year in which planners expect them to be reached. Such an approach will be particularly useful for the longer-range part of the implementation plan.

Preparation of the project-sequencing plan should be undertaken with a full understanding of how the airport sponsor will use the implementation plan. Given the high levels of complexity associated with such an effort, planners should ensure that planning resources are efficiently used to meet the sponsor's needs. In many cases, a plan that simply highlights the order of the projects and key activity triggers will be sufficient. In more complex situations, an implementation plan should include the preparation of an actual master schedule that incorporates project sequencing, key activities, and the identification of the responsible parties.

1104. KEY ACTIVITIES AND RESPONSIBILITIES

a. The implementation plan should provide information regarding key activities and responsibilities. Because the lead-time associated with many projects is significant, the early identification of key activities and responsibilities can help ensure that essential preparatory activities are completed on a timely basis. As with other elements of the implementation plan, the level of detail regarding key activities and responsibilities will vary, depending on the sponsor's needs and the complexity of the program.

The key activities and responsibilities will vary from airport to airport, but will include many of the following:

1. ***Sponsor-specific project approval activities***, such as airport board, council, or other administrative body approvals; various budgetary approvals and funding appropriations; and similar sponsor-specific items
2. ***Airline and other tenant approvals*** and lease modifications
3. ***Project funding activities***, such as FAA and other agency grant applications, PFC application, and long-term debt financing.
4. ***Environmental processing activities***, as appropriate, under current versions of FAA Order 1050.1, Environmental Impacts: Policies and Procedures and FAA Order 5050.4, FAA Airports guidance for complying with NEPA.
5. ***Land acquisition activities***
6. ***Sponsor-specific project implementation process activities*** associated with designing and constructing the projects
7. ***Agency coordination activities***, including the FAA, local metropolitan planning organization or its equivalent, Transportation Security Administration, Department of Defense, and other agencies that may have direct involvement with the airport
8. ***Public Coordination activities*** that carry the public involvement process into the project implementation phase

At a minimum, the listing of key activities and responsibilities should include what activities should be undertaken, by what party, and when. In more complex situations, it may be useful to provide a schedule of activities or to incorporate the key activities and responsibilities into the overall sponsor's CIP master schedule.

1105. DOCUMENTATION GUIDELINES

a. The documentation of the facilities implementation plan will vary, depending on the complexity of the study airport and sponsor objectives. Because the implementation plan may be read as a stand-alone document, planners should provide enough source documentation so the plan can be independent of the master plan. Planners should use appendices to improve the readability and organizational flow of the documentation, particularly if project data sheets, project booklets, or benefit/cost analyses are included. The documentation should include any electronic spreadsheets and files so as to facilitate the modification of the facilities implementation plan as needed. Prior coordination with the local FAA Airports office will facilitate the integration of the sponsor's CIP into the planning module of SOAR.

b. The documentation of the facilities implementation plan should normally include a new or revised CIP for at least the short-term airport development projects. Planners should address major developments in sufficient detail so the sponsor will know how to fund each project in the CIP. The plan should clearly indicate other agencies that are anticipated to provide grants-in-aid so they can determine the appropriate level of their involvement.

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Chapter 12 Financial Feasibility Analysis

1201. GENERAL

a. This chapter provides guidance on what will be required to demonstrate the airport sponsor's ability to fund the projects in the master plan. Planners should emphasize the projects that they expect to implement over the near-term, as presented in the capital improvement plan (CIP). A more general discussion of the funding of the medium- and long-term projects is more appropriate because of the uncertainty of future funding and - possible shifts in the importance of those projects.

b. The sponsor's ability to fund the recommended projects should be a major consideration in preparing the CIP and facilities implementation plans. The financial feasibility analysis should take place concurrently with the development of the CIP and the facilities implementation plan.

c. The level of effort necessary to conduct a financial feasibility analysis will vary considerably, based on the size of the airport. In general, items to consider are: the funding sources for the CIP, a projection of revenues and expenses (pro forma cash flow analysis) for each year of the CIP, and methods to enhance airport revenues.

d. During the scoping process for the master plan, planners may determine that the financial feasibility analysis need not be a stand-alone chapter. The CIP and facilities implementation plan should provide adequate information on how the projects in the CIP will be funded.

1202. SOURCES OF FUNDING

a. Airport development can be financed from several sources, including Federal and state grants-in-aid, private financing or third party development, passenger facility charges, customer facility charges, a variety of bonds, and local funds.

1) **Federal Funding** – Some airport projects are eligible for FAA funding through the Airport Improvement Program (AIP), which provides entitlement funds for primary airports (based upon their annual enplaned passengers), airports supporting significant cargo activity (based upon the proportion of landed cargo weight), state apportionment and nonprimary entitlement funds. Additional AIP funds, designated as discretionary, may also be available for eligible projects, based on the FAA's national priority system and several other factors.

Although the AIP has been reauthorized several times and the funding formulas have been periodically revised to reflect changing national priorities, the program has remained essentially the same. Public use airports included in the NPIAS and that serve civil aviation may receive AIP funding for eligible and justified projects, as described in FAA Order 5100.38, *Airport Improvement Program Handbook*. The airport sponsor must fund the remaining project cost, using a combination of the funding sources discussed in this section.

2) **State Funding** – Many states have programs to assist in airport capital development. The administration of these funds depends on the mechanisms established in each state. The most common source is a state aeronautics commission or department. State funds are often used to provide some part of the non-Federal share of projects supported by the FAA and for other projects that have been included in the state airport or aviation system plan. Most states have established a priority system for the allocation of state funds. Some states also provide limited funding to airports to support local economic development.

3) **Third Party Development** – Third party financing may be appropriate in a case where an airport sponsor uses a third party developer or a tenant to finance a construction project. Only projects with a strong positive cash flow can support this type of financing. Generally, the third party would lease the structure for a period of years to the tenant paying the airport ground rents. According to the terms of the agreement, the airport sponsor receives ownership of the asset upon expiration of the lease. This method of financing preserves the airport sponsor's cash to fund higher priority projects. Examples of projects that are funded in this manner include the development of passenger terminals, general aviation hangars, corporate hangars, and cargo facilities.

4) **Passenger Facility Charge** – The Aviation Safety and Capacity Expansion Act of 1990 authorized the Secretary of Transportation to grant public agencies the authority to impose a Passenger Facility Charge (PFC) to fund eligible airport projects. PFC revenue may be used on a "pay-as-you-go" basis or leveraged to pay debt service on bonds or other debt used to pay for PFC-eligible projects. Although the FAA is required to approve the collection and use of PFCs, the program permits local collection of PFC revenue through the airlines operating at an airport and provides more flexibility to airport sponsors than AIP funds.

   To be eligible for PFC funding, a project must preserve, enhance, or make a significant contribution to the safety, security, or capacity of the national air transportation system; reduce noise or mitigate noise impacts resulting from an airport; improve local air quality in accordance with the Voluntary Airport Low Emission program; or furnish opportunities for enhanced competition between or among air carriers; reduce current or anticipated congestion; or other qualification that may be added to the program over time. Allowable project costs include only those incurred on or after November 5, 1990. Regulations associated with the imposition of a PFC are described in 14 CFR Part 158, as implemented through FAA Order 5500.1, *Passenger Facility Charge*.

5) **Customer Facility Charge** – A customer facility charge (CFC) is a fee paid by airport customers for the use of some non-aeronautical service at the airport. These charges are commonly collected from on-airport rental car agencies. The funds are collected by the rental car agency from their customers and then paid to the airport for use in paying the debt service on, for example, a consolidated rental car facility. The airport constructs the facilities on behalf of the agency, allowing them to finance major projects, but keeping the debt off their balance sheets.

6) **Bonds** – A variety of bonds can be issued to support airport development projects.

a) ***General obligation bonds*** are backed by the creditworthiness and taxing power of the municipality operating the airport. They usually bear low interest rates because of their high degree of security. However, state laws may limit a municipality's overall debt, and competition from other community financing requirements may preclude their use for an airport project. Some states have an exemption from the debt limitation rule for general obligation bonds because they are used for a revenue producing enterprise.

b) ***Revenue bonds*** pledge the revenues of an airport sponsor to the repayment of debt service. These are the most common source of funding at larger commercial service airports. Revenue bonds are popular because they do not burden the taxpayer or affect the bonding capacity of the municipality. However, their use is limited to airports with a sufficient operating surplus to cover the debt service. Projected Net Revenues must exceed debt service requirements by at least 1.25 times and up to 2.0 times, depending on the strength of the bond issuer and the underlying assumptions with respect to the market risk for the bonds. Interest rates are dependent on the coverage ratio, but in any case will be higher than for general obligation bonds. Other factors that may affect the interest rates on revenue bonds are the strength of the local passenger market and the financial condition of the airlines serving the market.

c) ***Special facility revenue bonds*** are normally issued by the airport sponsor for the construction of a facility for a third party and backed by the revenues generated from that facility. This method of funding can be used for such facilities as maintenance hangars, airline reservation centers, terminal buildings, and air cargo terminals.

d) ***Industrial development bonds*** can be issued by states, local government, or an airport authority to fund the construction of an airport industrial park or other facilities that may attract business and increase non-aeronautical leasing revenues at the airport.

7) **Local Funds** – The remaining portion of project costs must be funded from local sources. The local share of project costs can come from the annual cash flow at the airport or with unrestricted cash balances available to the airport sponsor. The local municipality may provide the local share from its annual cash flow or available cash reserves.

1203. FINANCIAL FEASIBILITY

a. **Prepare CIP Funding Plan** – The CIP and development-phasing plan for the CIP prepared in the facilities implementation plan should be summarized, with the potential funding sources clearly identified for each year of the financial plan. The planner should use realistic assumptions about the amount of external funding available so an accurate plan of finance can be carried forward in the financial feasibility analysis.

If the airport sponsor needs to issue debt for projects included in the CIP, it should identify the financing assumptions for the amount of bond proceeds needed to cover the local share and annual debt service requirements.

b. **Review Airport's Financial Structure** – Planners should analyze the financial structure of the airport to determine the composition of the airport's management, relevant airport leases, and other operating issues that will affect future cash flow at the airport.

1) Airports are typically operated under the jurisdiction of city or county government, with airport or aviation departments or public authorities dedicated either to airports or aviation, or with a department responsible for aviation or airports. The ability of the airport to finance capital improvement projects depends upon the political, management, and financial structure under which these entities operate. The airport's ability to support development is based on the likelihood of obtaining Federal and state aid, its ability and willingness to issue a financial instrument to fund a portion of the costs, and the amount of revenue from airport operations.

2) Revenue-producing areas, or direct cost centers, for a high activity commercial service airport typically include the landing area (airfield), aircraft aprons, terminal, (both space rental and concessions), parking and ground transportation, cargo buildings, aircraft maintenance facilities, fixed base operator facilities, and other leased areas. Many of these revenue-producing facilities will not exist at smaller airports.

Airports commonly use two mechanisms for the recovery of airport operating costs from airlines and other tenants in the airport terminal: the compensatory cost method and the residual cost method. The compensatory approach allocates all airport costs to cost centers and the rates and charges are assigned to airport tenants based upon recovering these costs in proportion to the tenant's use of these facilities and services. A residual methodology has one or more signatory airlines agree to pay the net costs of operating the airport not recovered from other tenants or other sources of airport revenue. One of the basic differences in these two funding mechanisms is the assignment of risk. In the compensatory cost method, the airport sponsor assumes the financial risk, whereas in the residual cost method the signatory airlines assume the risk. These two methodologies represent either end of the airline rate-setting methodology spectrum. Many "hybrid" allocation methodologies are used at commercial service airports.

3) Planners should examine the budgeting process used by the airport to establish the financial management plan for operating revenue, operating and maintenance (O&M) expenses, and capital expenditures.

4) At larger airports where the complexity of the financial analysis increases, the planner should recognize that constraints may occur because of the various legal documents relating to the airport, including any bond ordinance, airline use and lease agreements, and other operating agreements at the airport, such as:

a) ***A Bond Ordinance or Trust Indenture*** limits the amount of additional debt that an airport sponsor can issue to fund capital projects and may include the application of revenue, rate covenant, and additional bonds test. The application of revenue refers to the priority of the flow of funds of the airport's gross revenues. A rate covenant requires the airport sponsor to set rates, fees, and charges at the airport at a level that will produce net revenues that will satisfy the debt service coverage requirement. An additional bonds test is the documentation the airport sponsor must produce to prove that the airport can generate the necessary coverage before it can issue additional bonds.

b) ***The Airline Use and Lease Agreement (AULA)*** is the contractual relationship between the airport and the airlines serving the airport. Normally this agreement would specify the airfield facilities available to each airline, the terminal space leased by each airline, and the rates and charges for use of the various facilities, landing fees, apron fees and any other charges. In a residual cost center arrangement, the airlines often have majority-in-interest (MII) approval, which is a weighted "vote" to construct capital projects that are included in the airline rate base. This allows an airport sponsor to include the net cost of a capital project in the airlines' rate base if a majority of the airlines approves that project, based on the terms of the AULA.

c) ***Lease documents*** are established between the airport and aeronautical and non-aeronautical tenants, such as fixed based operators, concessionaires, and airport service providers. Normally these lease agreements specify the term of the lease, the specific assignment of space for these business enterprises, the rental rate or fees for use of the facilities, and a concession fee.

d) ***Analyze Historical Cash Flow*** – The planner should examine both the airport revenues and O&M expenses by cost center, where applicable, for the prior three-to-five years and a historical cash flow profile for the airport that describes financial operating trends. The planner may decide to exclude non-cash expenditures such as depreciation and amortization. The historical cash flow will be useful in projecting future revenues and O&M expenses.

e) ***Prepare Pro Forma Cash Flow Analysis*** – The planner should prepare a pro forma cash flow analysis that projects airport revenues, O&M expenses, existing and new debt service requirements, and other non operating revenues and expenses for each year of the CIP. The general test of financial feasibility applied throughout the planning process is the ability of the airport sponsor to cover the local cost of the CIP through airport cash flow.

(1) Planners for low activity airports should recognize their dependence on Federal and state aid for improvements, but should not rely on the availability of such funds. Instead, they should consider alternative strategies for financing in an effort to become more self-sufficient, in accordance with AIP grant assurances. The master plan should discuss the investment requirements and the benefits of the proposed development, so the airport sponsor can make

practical decisions predicated on availability of funds and public investment priorities.

(2) High activity commercial service airports usually generate sufficient revenue to support revenue bond financing for capital improvements. Such airports' need to supplement bond financing with Federal aid will vary in degree, usually depending on activity levels. High activity commercial service airports are usually self-sufficient and produce adequate cash flow from setting rates, fees, and charges at the airport in accordance with the Bond Ordinance, airline use and lease agreements, and other operating agreements.

(3) In conducting the pro-forma cash flow analysis, the planner should focus on the three to five year time frame that coincides with the CIP. The planner should also emphasize the first 10 years of development, since the CIP is generally better defined during that period. Discuss development during the 10 to 20 year horizon in a broader manner, because projects during this period are often demand driven and will have a neutral effect on the airport's cash flow. In addition, over the longer-term, priorities for airport capital projects may change and a new master plan or update may be completed.

(4) In analyzing the financial feasibility of an airport's CIP, the planner may choose to value construction expenses, operating revenues, and O&M expenses in current year dollars.

(5) The planner may decide to increase the capital cost from current year dollars to the year in which construction is expected. If the planner conducts the analysis in this manner, inflationary impacts must be included in the projection of revenues and O&M expenses, along with increases because of operational factors.

f) ***Conduct Sensitivity Analysis*** – In some cases, a sensitivity test may be warranted to assess financial risk. For example, the planner may want to test different rates of passenger growth to determine how sensitive the financial plan is to this, particularly where PFCs or revenue bonds are being heavily relied upon in the CIP.

1204. REVENUE ENHANCEMENT

a. Airports are often under pressure to improve their financial condition to keep user costs at reasonable levels. In preparing the pro forma cash flow analysis, the planner should compare the financial performance of the study airport to that of comparable airports to identify ways to increase concession, airline, and non-aeronautical revenues.

b. Increases in concession revenues will be subject to the terms of existing operating agreements. Certain concessions may not be subject to operating agreement constraints, including automobile parking rates, future land rental rates, fuel flowage fees, and aircraft tie down fees, but may be subject to others constraints.

c. The existing AULA may not allow the airport sponsor to recover the cost of operating the airport from the airlines, or the terms of the existing airline agreement may no longer meet the needs of the airport sponsor. Alternatively, the airport sponsor may have sufficient unrestricted funds and wish to reduce airline-operating costs. In either case, the master planning process is a good time for the airport sponsor to examine its AULA and make appropriate revisions, to the extent it is able, particularly if there are projects in the CIP that will require funding from the airlines.

d. Non-aeronautical revenues provide the best opportunity for an airport sponsor to establish new types of lease revenue, based on the use of existing land parcels at the airport. An example of such an arrangement is a short-term lease of land to grow hay, grass or to graze cattle, which would allow the airport sponsor to increase revenues while maintaining control of the future use of the land. The airport sponsor should be aware of the restrictions placed on these activities by 14 CFR Part 139, wildlife hazard concerns, and grant assurances.

1205. BENEFIT COST ANALYSIS

a. The FAA *Airports Benefit Cost Analysis (BCA)*, December 1999, states that when possible, airport sponsors should conduct a BCA as part of the development of the master plan. FAA utilizes BCA to assess aviation user benefits of a proposed investment against its estimated costs. In an October 24, 2011, Federal Register notice, FAA stipulated that formal BCA is required for projects that enhance capacity at an airport and are expected to receive $10 million or more in AIP discretionary funds or apply for a Letter of Intent. If the airport sponsor decides to submit a complete BCA to the FAA, more detailed cost estimates for a project(s) will be required than those prepared for the facilities implementation plan.

1206. DOCUMENTATION GUIDELINES

a. The documentation of this chapter in the master plan should clearly show the financial feasibility of the CIP.

b. The financial planning chapter of a master plan for a large commercial service airport will be more complex than one for a low activity general aviation airport. In this chapter, planners should consider the funding plan for the CIP, historical cash flow, existing and future debt service requirements, airline rates and charges, airline cost per enplanement, concession revenues per enplanement, and pro forma cash flow analysis.

c. If a BCA has been prepared during the master plan process, it should be included as an Appendix to the master plan report.

d. Documentation provided to the airport should include any electronic spreadsheets and files to facilitate planners in modifying the financial plan on an as-needed basis.

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Appendix A Glossary

Advisory Circular – External publications issued by the FAA consisting of non-regulatory material providing for the recommendations relative to a policy, and guidance and information relative to a specific aviation subject.

Aircraft Approach Category – An alphabetic classification of aircraft based upon 1.3 times the stall speed in a landing configuration at their maximum certified landing weight.

Aircraft Operation – The landing, takeoff or touch-and-go procedure by an aircraft on a runway at an airport.

Aircraft Rescue and Fire Fighting – A facility located at an airport that provides emergency vehicles, extinguishing agents, and personnel responsible for minimizing the impacts of an aircraft accident or incident.

Airfield – The portion of an airport that contains the facilities necessary for the operation of aircraft.

Airplane Design Group – A Roman numerical classification of aircraft based upon wingspan.

Airport Authority – A quasi-governmental public organization responsible for setting the policies governing the management and operation of an airport or system of airports under its jurisdiction.

Airports Capital Improvement Plan – The planning program used by the Federal Aviation Administration to identify, prioritize and distribute funds for airport development and the needs of the National Airspace System to meet specified national goals and objectives.

Airport Improvement Program – A program authorized by the Airport and Airway Improvement Act of 1982 that provides funding for airport planning and development.

Airport Layout Plan – A scaled drawing of the existing and planned land and facilities necessary for the operation and development of an airport.

Airport Master Plan – The airport's concept of the long-term development and use of an airport's land and facilities.

Airport Obstruction Chart – A scaled drawing depicting the Federal Aviation Regulation (FAR) Part 77 surfaces, a representation of objects that penetrate these surfaces, runway, taxiway, and ramp areas, navigational aids, buildings, roads and other detail in the vicinity of an airport.

Airport Reference Code – A coding system used to relate airport design criteria to the operational and physical characteristics of the airplanes intended to use the airport. It is a two character code consisting of the aircraft approach category and the airplane design group.

Airport Reference Point – The latitude and longitude of the geometric center of the runway system at an airport.

Airport Sponsor – The entity that is legally responsible for the management and operation of an airport including the fulfillment of the requirements of laws and regulations related thereto.

Airside – The portion of an airport that contains the facilities necessary for the operation of aircraft.

Air Taxi – An aircraft operated under an air taxi operating certificate for the purpose of carrying passengers, mail, or cargo for revenue in accordance with FAR Part 121 and FAR Part 135.

Airport Traffic Control Tower – A facility in the terminal air traffic control system located at an airport which consists of a tower cab structure and an associated instrument flight rules room, if radar equipped, that uses ground-to-air and air-to-ground communications and radar, visual signaling, and other devices to provide for the safe and expeditious movement of terminal area air traffic in the airspace and airports within its jurisdiction.

Annual Service Volume (ASV) – The number of annual operations that can reasonably be expected to occur at the airport based on a given level of delay.

Approach Surface – An imaginary obstruction limiting surface defined in FAR Part 77 which is longitudinally centered on an extended runway centerline and extends outward and upward from the primary surface at each end of a runway at a designated slope and distance based upon the type of available or planned approach by aircraft to a runway.

Apron – A specified portion of the airfield used for passenger, cargo or freight loading and unloading, aircraft parking, and the refueling, maintenance and servicing of aircraft.

Avigation Easement – A contractual right or a property interest in land over which a right of unobstructed flight in the airspace is established.

Based Aircraft – The general aviation aircraft that use a specific airport as a home base.

Benefit Cost Analysis (BCA) – An analysis of the benefit, cost, and uncertainty associated with a project or action. A formal BCA is required for capacity projects of $10 million or more in AIP discretionary funds.

Building Restriction Line – A line defined by specifications and displayed on an airport layout plan beyond which airport buildings must not be located to limit building proximity to aircraft movement areas.

Capital Improvement Plan – The individual airport sponsor's plan for the capital needs of the airport, typically including their planned capital funding sources. This is separate and distinct from the FAA's Airports Capital Improvement Plan (ACIP), which is the FAA's plan for how to allocate AIP funds. .

Cargo Service Airport – An airport served by aircraft providing air transportation of property only, including mail, with an annual aggregate landed weight of at least 100,000,000 pounds.

Citizen's Advisory Committee (CAC) – A group of individuals that weigh recommendations against community goals, values, and needs.

Commercial Service Airport – A public airport providing scheduled passenger service that enplanes at least 2,500 annual passengers.

Computer Aided Design – Software that is commonly used for drafting architectural and engineering drawings.

Conical Surface – An imaginary obstruction-limiting surface defined in FAR Part 77 that extends from the edge of the horizontal surface outward and upward at a slope of 20 to 1 for a horizontal distance of 4,000 feet.

Critical (Design) Aircraft – The most demanding aircraft with at least 500 annual operations that operates, or is expected to operate, at the airport.

Crosswind – A wind that is not parallel to a runway centerline or to the intended flight path of an aircraft.

Crosswind Component – The component of wind that is not parallel to the runway centerline or the intended flight path of an aircraft.

Discretionary Funds – Federal grant funds that may be awarded to an airport based upon designation by the Secretary of Transportation or Congress to meet a specified national priority such as enhancing capacity, safety or security, or mitigating noise.

Displaced Threshold – An aircraft runway landing area that begins at a point on the runway other than the designated physical end of the runway.

Enplanement – The boarding of a passenger, cargo, freight or mail on an aircraft at an airport.

Entitlement – Federal funds for which a commercial service airport may be eligible based upon its annual passenger enplanements.

Environmental Assessment – An environmental analysis performed pursuant to the National Environmental Policy Act to determine whether an action would significantly affect the environment and thus require a more detailed environmental impact statement.

Environmental Impact Statement – A document required of federal agencies by the National Environmental Policy Act for major projects or legislative proposals affecting the environment. It is a tool for decision-making describing the positive and negative effects of a proposed action and citing alternative actions.

Federal Aviation Regulations – The general and permanent rules established by the executive departments and agencies of the Federal Government for aviation, which are published in the Federal Register. These are the aviation subset of the Code of Federal Regulations.

Finding of No Significant Impact (FONSI) – A public document prepared by a Federal agency that presents the rationale why a proposed action will not have a significant effect on the environment and for which an environmental impact statement will not be prepared.

Fixed Base Operator – A business enterprise located at on airport that provides services to pilots including aircraft rental, training, fueling, maintenance, parking, and the sale of pilot supplies.

General Aviation – The segment of aviation that encompasses all aspects of civil aviation except certified air carriers and other commercial operators such as airfreight carriers.

General Aviation Airport – An airport that supports air service primarily for general aviation purposes.

Geographic Information System (GIS) – A GIS is a computer system capable of capturing, storing, analyzing, and displaying geographically referenced information according to location. It is a technology that manages, analyzes, and disseminates geographic data.

Global Positioning System – A satellite based navigational system that provides signals in the cockpit of aircraft defining aircraft position in terms of latitude, longitude and altitude.

Ground Access – The transportation system on and around the airport that provides access to and from the airport by ground transportation vehicles for passengers, employees, cargo, freight, and airport services.

Horizontal Surface– An imaginary obstruction-limiting surface defined in FAR Part 77 that is specified as a portion of a horizontal plane surrounding a runway located 150 feet above the established airport elevation. The specific horizontal dimensions of this surface are a function of the types of approaches existing or planned for the runway.

Instrument Flight Rules – Procedures for the conduct of flight in weather conditions below Visual Flight Rules weather minimums. The term IFR is often also used to define weather conditions and the type of flight plan under which an aircraft is operating.

Instrument Meteorological Conditions – Meteorological conditions expressed in terms of specific visibility and ceiling conditions that are less than the minimums specified for visual meteorological conditions.

Itinerant Operations – Operations by aircraft that leaves the local airspace.

Landside – The portion of an airport that provides the facilities necessary for the processing of passengers, cargo, freight, and ground transportation vehicles.

Local Operations – Aircraft operations performed by aircraft that are based at the airport and that operate in the local traffic pattern or within sight of the airport, that are known to be departing for or arriving from flights in local practice areas within a prescribed distance from the airport, or that execute simulated instrument approaches at the airport.

Military Operations – Aircraft operations that are preformed in military aircraft.

National Airspace System – The network of air traffic control facilities, air traffic control areas, and navigational facilities throughout the U.S.

National Environmental Policy Act (NEPA) – Federal legislation that establishes environmental policy for the nation. It requires an interdisciplinary framework for federal agencies to evaluate and disclose environmental impacts and contains procedures to ensure that federal agency decision makers take environmental factors into account.

National Plan of Integrated Airport Systems – The national airport system plan developed by the Secretary of Transportation on a biannual basis for the development of public use airports to meet national air transportation needs.

Navigational Aid – A facility used as, available for use as, or designed for use as an aid to air navigation.

Operation – The landing, takeoff or touch-and-go procedure by an aircraft on a runway at an airport.

Passenger Facility Charge (PFC) – The collection of PFC fees for every enplaned passenger at commercial airports controlled by public agencies to be used to fund FAA-approved projects that enhance safety, security, or capacity; reduce noise; or increase air carrier competition.

Peak Hour (PH) – An estimate of the busiest hour in a day. This is also known as the design hour.

Planning Activity Level (PAL) – Selected activity levels that may trigger the need for additional facilities or improvements.

Primary Airport – A commercial service airport that enplanes at least 10,000 annual passengers.

Primary Surface – An imaginary obstruction limiting surface defined in FAR Part 77 that is specified as a rectangular surface longitudinally centered about a runway. The specific dimensions of this surface are a function of the types of approaches existing or planned for the runway.

Record of Decision (ROD) – A public document that reflects the FAA's final decision, rationale behind that decision, and commitments to enforce and monitor mitigation.

Regression Analysis – A statistical technique that seeks to identify and quantify the relationships between factors associated with a forecast.

Reliever Airport – General aviation airports in major metropolitan areas that provide pilots with attractive alternatives to using congested hub airports.

Runway – A defined rectangular area at an airport designated for the landing and taking-off of an aircraft.

Runway Gradient – The ratio of the change in elevation divided by the length of the runway expressed as a percentage.

Scope – The document that identifies and defines the tasks, emphasis and level of effort associated with a project or study.

System Of Airports Reporting (SOAR) – The FAA Office of Airports integrated database that contains airport planning, development, and financial information.

Technical Advisory Committee (TAC) – A group of individuals that provide input on technical issues.

Terminal Area Forecast – The official forecast of aviation activity, both aircraft and enplanements, at FAA facilities. This includes FAA-towered airports, federally contracted towered airports, non-federal towered airports, and many non-towered airports.

Terminal Instrument Procedures – Published flight procedures for conducting instrument approaches to runways under instrument meteorological conditions.

Transient Operations – Operations by aircraft that are not based at a specified airport.

Transitional Surface – An imaginary obstruction-limiting surface defined in FAR Part 77 that extends outward and upward at right angles to the runway centerline and the runway centerline extended at a slope of 7 to 1 from the sides of the primary and approach surface.

Uncontrolled Airport – An airport without an air traffic control tower at which the control of Visual Flight Rules traffic is not exercised.

Visual Flight Rules – Procedures for the conduct of flight in weather conditions above Visual Flight Rules (VFR) weather minimums. The term VFR is often also used to define weather conditions and the type of flight plan under which an aircraft is operating.

Visual Meteorological Conditions – Meteorological conditions expressed in terms of specific visibility and ceiling conditions which are equal to or greater than the threshold values for instrument meteorological conditions.

Wide Area Augmentation System – An enhancement of the Global Positioning System that includes integrity broadcasts, differential corrections, and additional ranging signals for the purpose of providing the accuracy, integrity, availability, and continuity required to support all phases of flight.

Appendix B Useful Reference Materials

1. FAA ADVISORY CIRCULARS

Most of these Advisory Circulars are available for viewing and/or printing on the FAA website at http://www.faa.gov/regulations_policies/advisory_circulars/. See the most recent versions.

70/7460-1 Obstruction Marking and Lighting. Describes the FAA standards for marking and lighting structures to promote safety.

90-66 Recommended Standard Traffic Patterns and Practices for Aeronautical Operations at Airports without Operating Control Tower. Calls attention to regulatory requirements and recommended procedures for aeronautical operations at airports without operating control towers. It recommends traffic patterns and operational procedures for aircraft, lighter than air, glider, parachute, rotorcraft, and ultra-light vehicle operations where such use is not in conflict with existing procedures in effect at those airports.

90-98 Simultaneous Closely Spaced Parallel Operations at Airports Using Precision Runway Monitor (PRM) Systems. Notify pilots and operators about the establishment of specific air traffic procedures to conduct flight operations into airports identified for simultaneous closely-spaced parallel approaches using PRM systems.

150/5020-1 Noise Control and Compatibility Planning for Airports. Provides general guidance for noise control and compatibility planning for airports. Provides specific guidance for preparation of airport noise exposure maps and airport noise compatibility programs by airport sponsors for submission under FAR Part 150 and the Aviation Safety and Noise Abatement Act of 1979.

150/5060-5 Airport Capacity And Delay. Explains how to compute airport capacity and aircraft delay for airport planning and design.

150/5100-14 Architectural, Engineering, and Planning Consultant Services for Airport Grant Projects. Provides guidance for airport sponsors in the selection and employment of architectural, engineering, and planning consultants under Federal Aviation Administration airport grant programs.

150/5100-17 Land Acquisition and Relocation Assistance for Airport Improvement Program Assisted Projects. Provides guidance to sponsors of airport projects developed under the Airport Improvement Program to meet the requirements of the Uniform Relocation Assistance and Real Property Acquisition Act of 1970 (PL 91-646, as amended) and the regulations of the Office of the Secretary of Transportation, 49 CFR Part 24.

150/5100-19 Guide for Airport Financial Reports Filed by Airport Sponsor. Provides airport sponsors with guidance for complying with the airport financial reporting requirements required by 49 USC §47107(a)(15).

150/5190-4 A Model Zoning Ordinance to Limit Height of Objects around Airports. Provides a model zoning ordinance to be used as a guide to control the height of objects around airports.

150/5190-7 Minimum Standards for Commercial Aeronautical Activities. Provides basic information about the FAA's recommendations on commercial minimum standards and related policies.

150/5200-30 Airport Winter Safety and Operations. Provides guidance to assist airport owners/sponsors in the development of an acceptable airport snow and ice control program and to provide guidance on appropriate field condition reporting procedures.

150/5200-31 Airport Emergency Plan. Provides guidance for the preparation of emergency plans at civil airports.

150/5200-33 Hazardous Wildlife Attractants On or Near Airports. Provides guidance on locating certain land uses having the potential to attract hazardous wildlife to or in the vicinity of public-use airports.

150/5200-34 Construction or Establishments of Landfills Near Public Airport. Contains guidance on complying with new Federal statutory requirements regarding the construction of establishment of landfills near public airports.

150/5210-15 Airport Rescue and Firefighting Station Building Design. Provides standards and guidance for planning, designing, and constructing and airport rescue and firefighting station.

150/5220-18 Buildings for Storage and Maintenance of Airport Snow and Ice Control Equipment and Materials. Provides guidance for site selection, design and construction of buildings used to store and maintain airport snow and ice control equipment and materials.

150/5300-7 FAA Policy on Facility Relocations Occasioned by Airport Improvements or Changes. Reaffirms the aviation community of the FAA policy governing responsibility for funding relocation, replacement and modification to air traffic control and air navigation facilities that are made necessary by improvements or changes to the airport.

150/5300-9 Predesign, Prebid, and Preconstruction Conferences for Airport Grant Projects. Provides guidance for conducting predesign, prebid, and preconstruction conferences for projects funded under the FAA airport grant program.

150/5300-13 Airport Design. Contains the FAA’s standards and recommendations for airport design.

150/5300-14 Design of Aircraft Deicing Facilities. Provides standards, specifications, and guidance for designing aircraft deicing facilities.

150/5300-15 Use of Value Engineering for Engineering and Design of Airport Grant Projects. Provides guidance for the use of value engineering in airport projects funded under

the FAA's Airport Grant Program. This Advisory Circular should be used by sponsors of airport development projects considering the application of value engineering to projects involving grant funds.

150/5320-5 Airport Drainage. Provides guidance for engineers, airport managers, and the public in the design and maintenance of airport drainage systems.

150/5320-6 Airport Pavement Design and Evaluation. Provides guidance to the public for the design and evaluation of pavement at civil airports.

150/5325-4 Runway Length Requirements for Airport Design. Provides design standards and guidelines for determining recommended runway lengths.

150/5340-1 Standards for Airport Markings. Contains the FAA standards for markings used on airport runways, taxiways, and aprons.

150/5340-18 Standards for Airport Sign Systems. Contains the FAA standards for the siting and installation of signs on airport runways and taxiways.

150/5360-9 Planning and Design of Airport Terminal Facilities at Non-Hub Locations. Provides guidance material for the planning and design of airport terminal buildings at non-hub locations.

150/5360-12 Airport Signing and Graphics. Provides guidance on airport related signs and graphics.

150/5360-13 Planning and Design Guidelines for Airport Terminal Facilities. Provides guidelines for the planning and design of airport terminal buildings and related access facilities.

150/5390-2 Heliport Design. Provides recommendations and standards for heliport design.

150/5395-1 Seaplane Bases. Provides guidance to assist operators in planning, designing, and constructing seaplane base facilities.

2. FAA ORDERS

Virtually all of the following orders are available for viewing and/or printing on the FAA website at http://www.faa.gov/regulations_policies/orders_notices/.

1050.1 Environmental Impacts: Policies and Procedures. Provides policies and procedures to ensure FAA compliance with the provisions of the National Environmental Policy Act.

5050.4 National Environmental Policy Act (NEPA) Implementing Instructions for Airport Projects. FAA Airports guidance for complying with NEPA. Provides instructions and guidance for the preparation and processing of environmental assessments, findings of no significant impact, and environmental impact statements for airport development proposals and other airport activities.

5090.3 (current version) Field Formulation of the National Plan of Integrated Airport Systems. This order contains instructions for FAA Regional offices in the formulation and maintenance of the NPIAS computer database and on the preparation of the Secretary of Transportation's biennial Report to Congress.

5500.1 Passenger Facility Charge. Provides guidance and the processes to be used by FAA personnel in administering the Passenger Facility Charge program.

5100.38 Airport Improvement Program Handbook. Provides guidance and sets forth policies and procedures for the administration of the Airport Improvement Program by the FAA.

5100.39 Airports Capital Improvement Plan. Prescribes the development of the national Airports Capital Improvement Program that serves as the primary planning tool for systematically identifying, prioritizing and assigning funds to critical airport development and associated capital needs for the National Airspace Program.

8260.3 United States Standard for Terminal Instrument Procedures (TERPS). Contains criteria for instrument approach and departure procedures.

3. FEDERAL AVIATION REGULATIONS

Virtually all of the following Federal regulations addressing aviation are available for viewing and/or printing on the FAA website at http://www.faa.gov/regulations_policies/faa_regulations/.

14 CFR Part 77 Safe, Efficient Use, and Preservation of the Navigable Airspace

14 CFR Part 150 Airport Noise Compatibility Planning

14 CFR Part 158 Passenger Facility Charges (PFCs)

4. TRANSPORTATION SECURITY REGULATIONS

The following Transportation Security Regulations (TSRs) are available for viewing and/or printing on the Transportation Security Administration website at www.tsa.gov/.

TSR Part 1540 Civil Aviation Security: General Rules. Definitions and rules for all aspects of aviation.

TSR Part 1542 Airport Security. Requirements for airport security programs including establishment of secured areas, air operation areas, security identification display areas, and access control systems. Also describes requirements related to Security Directives.

TSR Part 1544 Aircraft Operator Security: Air Carriers and Commercial Operators. Applies primarily to operators holding certificates for scheduled and charter passenger operations. Details the requirements for security program and screening of passengers and property.

TSR Part 1546 Foreign Air Carrier Security. Discusses security and screening requirements.

TSR Part 1548 Indirect Air Carrier Security. Describes requirements for indirect carriers such as freight forwarders.

TSR Part 1550 Aircraft Security Under General Operating and Flight Rules. Applies to operation of all other aircraft such as general aviation aircraft.

5. SECURITY-RELATED PUBLICATIONS

Recommended Security Guidelines for Airport Planning, Design, and Construction. (Formerly DOT/FAA/AR-00-52, June 2001. TSA Revised May 2011.) Available from TSA at http://www.tsa.gov/aviation-security-advisory-committee.

Security Guidelines for General Aviation Airports (Information Publication A-001), Transportation Security Administration, May 2004. Available from TSA at http://www.tsa.gov/stakeholders/security-directives.

Integrated Security System Standard for Airport Access Control. (RTCA DO-230C, June 2011) Available from RTCA at http://www.rtca.org.

6. FAA REPORTS

Airport Noise Compatibility Planning (ANCP) Toolkit, FAA Office of Environment and Energy (http://www.faa.gov/about/office_org/headquarters_offices/apl/noise_emissions/planning_toolkit/).

FAA Airport Benefit-Cost Analysis Guidance, Office of Aviation Policy and Plans (http://www.faa.gov/airports/aip/bc_analysis/).

FAA Guide to the Best Practices for Environmental Impact Statement Management, FAA Office of Airport Planning and Programming (http://www.faa.gov/airports/environmental/eis_best_practices/).

Forecasting Aviation Activity by Airport, GRA, Inc., FAA Office of Aviation Policy and Plans (APO-110), July 2001. (http://www.faa.gov/data_research/aviation_data_statistics/).

Intermodal Ground Access to Airports: A Planning Guide, Federal Highway Administration, Intermodal Division and Federal Aviation Administration, National Planning Division, Report No. DOT/FAA/PP/96-3. Available from National Technical Information Service as PB97-189484 (www.ntis.gov).

National Plan of Integrated Airport Systems (NPIAS), FAA Office of Airport Planning and Programming, Airport Planning and Environmental Division (http://www.faa.gov/airports/planning_capacity/npias/).

Terminal Area Forecast (TAF), FAA Office of Aviation Policy and Plans (http://www.faa.gov/about/office_org/headquarters_offices/apl/aviation_forecasts/).

Recycling, Reuse and Waste Reduction at Airports: A Synthesis, FAA Office of Airport Planning and Programming, July 2013.

7. GENERAL AIRPORT PUBLICATIONS

Aerodromes, Annex 14 to the Convention on International Civil Aviation, International Civil Aviation Organization.

Aerodromes, Annex 14 Vol. 1 Aerodrome Design and Operations to the Convention on International Civil Aviation, International Civil Aviation Organization.

Aerodromes, Annex 14 Vol. 2 Heliports to the Convention on International Civil Aviation, International Civil Aviation Organization.

Aerodrome Design Manual, Part 1, Runways, International Civil Aviation Organization.

Aerodrome Design Manual, Part 2, Taxiways, Aprons and Holding Bays, International Civil Aviation Organization.

Airport Engineering, Ashford and Wright, John Wiley & Sons, Inc.

Airport Finance, Ashford and Moore, Van Nostrand Reinhold, Inc.

Airport Planning and Management, Smith, Odegard and Shea, Wadsworth Publishing Company.

Airport Planning and Management, Wells and Young, McGraw-Hill Companies, Inc.

Airport Planning Manual, Part 1 – Master Planning, International Civil Aviation Organization.

Airport Planning Manual Part 2 – Land Use and Environmental Control, International Civil Aviation Organization.

Airport Systems Planning, Design, and Management, deNeufville and Odoni, McGraw-Hill Companies, Inc.

Airport Terminals Reference Manual, International Air Transportation Association.

Construction of Visual and Instrument Flight Procedures (PANS-OPS), International Civil Aviation Organization.

Environmental Protection, Annex 16 to the Convention on Civil Aviation, International Civil Aviation Organization.

Planning and Design of Airports, Horonjeff and McKelvey, McGraw-Hill Companies, Inc.

STOL Port Manual, International Civil Aviation Organization.

8. AIRPORT COOPERATIVE RESEARCH PROGRAM (ACRP) REPORTS

The following ACRP publications are available for viewing and/or printing on the Transportation Research Board website at http://www.trb.org/Publications/PubsACRPPublications.aspx.

ACRP Synthesis 2, Airport Aviation Activity Forecasting, Airport Cooperative Research Program, March 31, 2007.

ACRP Synthesis 10, Airport Sustainability Practices, Airport Cooperative Research Program, October 23, 2008.

ACRP Synthesis 33, Airport Climate Adaptation and Resilience, Airport Cooperative Research Program, June 18, 2012.

ACRP Synthesis 37, Lessons Learned from Airport Safety Management Systems Pilot Studies, Airport Cooperative Research Program, August 6, 2012.

ACRP Report 1, Safety Management Systems for Airports, Airport Cooperative Research Program, September 4, 2007.

ACRP Report 4, Ground Access to Major Airports by Public Transportation, Airport Cooperative Research Program, July 9, 2008.

ACRP Report 10, Innovations for Airport Terminal Facilities, Airport Cooperative Research Program, February 26, 2009.

ACRP Report 23, Airport Passenger-Related Processing Rates Guidebook, Airport Cooperative Research Program, November 11, 2009.

ACRP Report 25, Airport Passenger Terminal Planning and Design, Volume 1: Guidebook, Airport Cooperative Research Program, April 7, 2010.

ACRP Report 25, Airport Passenger Terminal Planning and Design, Volume 2: Spreadsheet Models and User's Guide, Airport Cooperative Research Program, March 18, 2010.

ACRP Report 30, Reference Guide on Understanding Common Use at Airports, Airport Cooperative Research Program, May 26, 2010.

ACRP Report 35, Planning for Offsite Airport Terminals, Airport Cooperative Research Program, September 27, 2010.

ACRP Report 40, Airport Curbside and Terminal Area Roadway Operations, Airport Cooperative Research Program, December 2, 2010.

ACRP Report 55, Passenger Level of Service and Spatial Planning for Airport Terminals, Airport Cooperative Research Program, October 13, 2011.

ACRP Report 56, Handbook for Considering Practical Greenhouse Gas Emission Reduction Strategies for Airports, Airport Cooperative Research Program, January 7, 2012.

ACRP Report 77, Guidebook for Developing General Aviation Airport Business Plans, Airport Cooperative Research Program, November 15, 2012.

ACRP Report 79, Evaluating Airfield Capacity, Airport Cooperative Research Program, December 17, 2012.

ACRP Report 80, Guidebook for Incorporating Sustainability into Traditional Airport Projects, Airport Cooperative Research Program, November 4, 2012.

ACRP Report 82, *Preparing Peak Period and Operational Profiles – Guidebook*, Airport Cooperative Research Program, February 15, 2003.

Appendix C List of Potential Stakeholders

Users and tenants:

- Commercial service and charter airlines
- Air cargo airlines and operators
- Corporate aircraft owners
- Freight forwarders
- Airline ground handling and catering companies
- Airline maintenance base operators
- Aircraft fueling and storage operators
- General aviation aircraft owners
- General aviation hangar owners and tenants
- Fixed base operators
- Air tour operators
- Air ambulance and rescue operators
- Flight schools
- Flying clubs/Civil Air Patrol
- Military users and tenants of the airport
- Rental car operators
- Parking lot operators
- Concessionaires
- Ground transportation companies (taxi, shuttle bus, limousine operators, and public transportation)

Groups and individuals from within the airport sponsor's organization:

- Airport board or similar executive group
- Airport executive director or manager
- Airport executive management team (operations director, engineering/planning director, maintenance director, finance director, and others.
- Airport senior line operations and line maintenance personnel
- Airport senior fire and safety officer

FAA personnel from these offices:

- Airports District Office
- Air Traffic Organization
- Airport Traffic Control Tower
- Regional Technical Operations
- System Management Office
- Regional Flight Standards
- Runway Safety Office
- Flight Procedures Office
- NAS Implementation Center
- Flight Service Station

Resource agencies and other governmental units with regulatory or review authority:

- Federal Inspection Service agencies
- Federal agencies with responsibility for affected resources
- Transportation Security Administration
- Federal, state, regional, and local air quality, water quality, and wildlife agencies
- Representatives of local political jurisdictions
- State, regional, metropolitan and local planning office
- State, regional, metropolitan and local transportation and land use planning agencies
- State aeronautics office
- State and local environmental regulatory authorities
- Native American and Alaska Native tribes and pueblos
- On-airport law enforcement agency
- Local fire and police departments

Other interested groups:

- Private land owners and developers
- Airport hotel and business associations
- Local tourism board or authorities
- Chamber of Commerce and other economic development groups
- Citizens and others with a strong economic or social tie to the airport
- Non-government organizations
- Neighborhood associations
- Traveling public

Appendix D Consideration of Environmental Factors in Airport Master Planning

1. INTRODUCTION

This appendix presents practices that can be applied to airport master planning to make the planning process and subsequent environmental analysis more efficient. A more integrated and efficient planning and decision making process should reflect environmental values, result in less delay, and avoid conflicts in the completion of needed airport development.

The consideration of environmental factors by Federal agencies is delineated in Council on Environmental Quality (CEQ) regulations implementing the National Environmental Policy Act (NEPA), reference 40 CFR 1500.5(a) and 1501.2. The NEPA statute and CEQ regulations require all Federal agencies to integrate the NEPA process with other planning at the earliest possible time. This is to ensure that planning and decisions reflect environmental values. CEQ regulations require Federal agencies to "utilize a systematic, interdisciplinary approach which will insure the integrated use of the natural and social sciences and the environmental design arts in planning and in decision making which may have an impact on man's environment." Doing this early in the planning process helps incorporate environmental factors in project planning and development, avoid delays and second-guessing later in the NEPA process, and can head off potential conflicts.

This guidance is not intended to make master planning a part of the NEPA process. It is to ensure that supportable and consistent planning data and environmental, technical, economic and other planning analyses are provided for use in FAA decision making. Airport planning provides the basis for a project's purpose and need in environmental evaluation and the alternatives that the FAA will carry into its NEPA analysis.

a. **Applicability**

This guidance is primarily intended for complex and controversial undertakings such as capacity projects at larger airports. It may also be helpful in the planning of projects smaller in scope, and should be reviewed prior to starting an airport master plan that has the potential to impact resources. It is intended for airport development professionals (e.g., planners, environmental specialists, project managers, engineers) employed by airport sponsors, consultants, FAA and state agencies.

b. **Clarifications**

When this document refers to airport planners it means individuals engaged in airport planning, no matter their specific job title. When the document refers to environmental specialists it means individuals engaged in environmental analysis or review, no matter their specific job title. When the document refers to engineers it means individuals engaged in engineering, no matter their specific job title. The term "project (program) manager" is not used, although it is recognized that many organizations employ "project managers" in airport planning, environmental analysis, and engineering.

2. PRACTICE AND PROCESS

a. Background

This section summarizes the key points of NEPA as it relates to project planning. When the term "agency" is used, it refers to Federal agency.

CEQ regulations require agencies to identify environmental effects and values in adequate detail so they can be compared to economic and technical analyses. Agencies must study, develop and describe appropriate alternatives to recommended courses of action in any proposal that involves unresolved conflicts concerning alternative uses of available resources. To permit these, environmental analysis must be integrated early in planning along with other planning analyses.

In cases where actions are planned by private applicants or other non-Federal entities before Federal involvement, agencies must ensure that 1) policies or designated staff are available to advise potential applicants of studies or other information likely required for later Federal action; 2) applicants are aware of the Federal agencies need to consult with State and local agencies and Indian tribes and with interested private persons and organizations when its own involvement is reasonably foreseeable; and 3) the Federal agency commences its NEPA process at the earliest possible time after the project proponent or sponsor has completed planning sufficient to allow environmental impact analysis.

b. Timing of Airport Planning and Environmental Analysis

Environmental considerations are integral to the planning process, and should be identified and evaluated at the same time as economic and technical analyses and prior to commencing preparation of an EA or EIS. This will assist in defining those projects that are reasonably foreseeable, and therefore may be subject to the NEPA analysis.

Airport planning should be complete or nearly so when the airport sponsor begins preparing its EA or FAA begins preparing its EIS. If a sponsor selects a recommended alternative and completes its planning process before beginning environmental processing, the FAA is not obligated to select that recommended alternative as its preferred alternative. FAA will select its preferred alternative during the NEPA process. Starting preparation of a NEPA document immediately after the completion of planning may improve the likelihood that aviation forecast and modeling data remain current during the environmental analysis process. In the case of an Environmental Impact Statement, the start of the NEPA process would be considered the issuance of a Notice of Intent to prepare the EIS. For an Environmental Assessment, the start of the NEPA process (for the purpose of this guidance) should be considered the earlier of: the approval of an AIP grant for the EA; or the initiation of the environmental resource agency/community coordination. The airport sponsor and FAA should always complete (and document) the following prior to commencing preparation of an EIS or EA.

- Local aviation forecasts that are current and approved by the FAA
- Justification of the scope and timing of the project's planned facilities based on airport planning, operational requirements, and design standards
- Identification and consideration of all reasonable planning alternatives (within the sponsor's or FAA's jurisdiction), eliminating (and documenting) those not meeting the stated aeronautical need. If an alternative does potentially meet the aeronautical need, but is not considered reasonable, provide sufficient explanation as to why not
- Tentative identification of studies or other information likely required for later Federal action, as well as appropriate State and local agencies, Indian tribes, private persons and organizations likely to have an interest in the project.

Also, it is important that only those alternatives that have aeronautical utility (i.e., can be built and operated safely) are forwarded for analysis under NEPA. Sometimes it may be necessary to conduct airspace reviews (during planning) of various planning alternatives to determine their aeronautical utility and safety.

Additional discussion on forecasts, project requirements and alternative analysis is included below.

c. **Local Government and Community Involvement in Airport Planning**

Establishing long-term cooperative consultation between the airport sponsor and local, regional, and state governments and planning organizations with land use, zoning, and surface access responsibilities can improve consistency between community and airport planning. This consultation makes it easier to gain local agreement on individual airport projects. Such consultation enables the airport sponsor to voice its interests in future land compatibility, obstruction control, and surface transportation access. Local planners benefit by learning airport needs for the promotion of community access and the local economy. Information on the future airport expansion and improvement contained in an airport master plan should be incorporated into the development of comprehensive land use plans to ensure land use compatibility around airports.

History shows that successful projects involve the community early in airport master planning. This involvement educates and informs local citizens, and allows them to provide constructive input to guide the airport sponsor and FAA decision-making. Community involvement during master planning should include information on the airport's proposed project, its aviation need (problem) and possible alternative ways to address the need. Input should be solicited and questions from the community should be encouraged. Input received should be considered and timely responses to questions raised should be provided. The community includes the public and local government in the vicinity of the airport, including Native American Tribal Organizations, metropolitan and regional planning organizations, and airport businesses and tenants.

Community involvement in the planning process, as described above, should ensure community awareness of proposed action prior to commencing preparation of an EA or

EIS. The NEPA process should not be the first time that the community hears about the proposal. Community involvement during planning is a natural part of good planning and is separate and distinct from public comment under NEPA. In developing a community involvement process, the airport sponsor should strike a balance between soliciting meaningful participation and keeping the master plan process on track. Depending on the scope of the project and the degree of anticipated controversy, community involvement specialists may need to become involved. Early involvement is critical to getting a sense of perspective about where and how the airport fits within the community and what concerns the community has and why. Such involvement may be needed to develop local agreement, which is often necessary to secure support from local officials for the project. A public consultation plan should be prepared identifying the type, number, and timing of public forums and identifying the public sector(s) having concerns about the proposal. It is essential that the community be advised as to its role throughout the planning process.

AIP grant assurances require that airport sponsors take appropriate action, to the extent reasonable, to restrict the use of land adjacent to airports to activities consistent with normal airport operations. Zoning authorities should be strongly encouraged to put height limits in place to protect current and planned aircraft approaches. The airport sponsor should also emphasize to local officials the importance of zoning for airport-compatible land use, including noise sensitive areas and airport design surfaces, so that the airport may remain a transportation asset to the community. In addition, frequent coordination with local, regional, and state organizations responsible for surface transportation planning helps ensure that improvements in airport capacity are matched with commensurate improvements in surface access.

The "FAA Community Involvement Manual", document FAA-EE-90-03, should be consulted to help develop a community involvement program. This manual can be accessed in the "Communications Tools" section of the Airport Noise Compatibility Planning Toolkit at http://www.faa.gov/about/office_org/headquarters_offices/aep/planning_toolkit/. There are a number of State DOTs that have similar guidance. Additional discussion on community involvement can be found under the "Community Consultation" section of the FAA document "Best Practices Guide-Initiative 6 to May 2001 Report to Congress on Streamlining the Environmental Process," which is available at http://www.faa.gov/airports/environmental/.

d. **FAA Role in Airport Master Planning**

The primary responsible party for airport master planning is the airport sponsor. However, early coordination with FAA is essential to efficient project management. FAA is involved in airport planning to ensure that proposed airport development is safe, has utility, and meets airport design standards, and identifies obvious issues that could become environmental concerns. Additionally, if Airport Improvement Program (AIP) money is needed, FAA ensures that the scope and timing of the proposed development is appropriate for Federal financial participation. FAA carries out these requirements through the following actions:

- Review and approval of local aviation forecasts and design aircraft
- Review and approval of site selection studies
- Review and approval of airport layout plans, including completion of airspace studies*
- Review the adequacy of the planning alternative analysis for incorporation into the subsequent NEPA Analysis
- Review of capital improvement planning

**Refer to the FAA "Community and Environmental Needs Division" memorandum of November 18, 2003 for guidance on how to treat airport layout plans that show proposed development that is undergoing NEPA analysis and review.*

When AIP funds are involved, FAA ensures that the scope of a project's planned facilities is justified.

Finally, FAA reviews master plan work scopes where the airport sponsor is seeking AIP or Passenger Facility Charge (PFC) funds to help finance preparation of the master plan.

e. **EIS Conceptual Engineering**

For complex projects, it is often necessary to conduct some engineering analysis to enable the airport sponsor and/or the FAA to make planning and environmental decisions. To avoid prejudging alternatives, the engineering should be limited to that necessary to:

- Define alternatives within FAA or sponsor's jurisdiction for environmental analysis
- Assess aeronautical safety and utility of these alternatives
- Comparatively analyze environmental impacts
- Inform the public and environmental resource agencies
- Identify potential environmental mitigation during the environmental analysis, and
- Determine the order of magnitude of project costs

Early in the planning process, airport planners, environmental specialists and engineers should agree to the appropriate extent of conceptual engineering effort, the responsible parties for the effort, and the schedule for accomplishing such engineering.

f. **Facility Requirements/Purpose and Need**

"Facility requirements" is a term used in airport planning to describe the development required to address documented airport needs. The analysis and documentation supporting the facility requirements are normally contained in an airport master plan. This analysis needs clearly to define the aviation problem(s) and why the airport needs to solve it (them). Care should be taken that the facility requirements are not so narrowly defined so that they unreasonably point to a single solution.

"Purpose and Need" is a NEPA term that refers to a section of an environmental document, which describes the purpose of, and need for, the proposed Federal action. The problem to be addressed is identified (need), the requested Federal action is noted as a possible solution to the problem (purpose), and information that supports that a problem exists is presented (or referenced).

FAA planners should ensure that the "Facility Requirements" analysis provides information sufficient to provide a basis for describing the "Purpose and Need" for proposed Federal actions. FAA environmental professionals can be helpful in determining the adequacy of "Facility Requirements" documentation for use in defining purpose and need under NEPA.

As always, projects that are seeking AIP or PFC funding need to be justified on aeronautical grounds. Economic development should not be a basis for justifying AIP or PFC assistance.

g. **Alternative Analysis**

The master plan is not intended to establish a single project alternative for NEPA evaluation, but to identify alternatives that meet the airport's aeronautical needs. It may establish the sponsor's recommended alternative. It should consider all reasonable alternatives normally within the jurisdiction of the airport sponsor and the FAA, including operational alternatives. Those alternatives that do not meet the planning need (i.e., facility requirements), or are not feasible or prudent, should be dismissed, with the reasons for dismissal appropriately documented in the master plan. This should include reasons why planning did not consider alternatives that avoided or minimized environmental areas or conditions contributing to extensive mitigation. The master plan should also document the justification for any sponsor recommended alternative, as well as the reasons for not recommending others. An airspace review (i.e., NRA case) of alternatives may be necessary to determine if alternatives can be built and are operationally feasible before their environmental impacts are evaluated in a NEPA document. A preliminary cost estimate, similar in detail to cost estimates normally prepared in master plans and depicted in capital improvement plans, should be developed for all alternatives to be analyzed in a NEPA document.

Unlike the master plan, a NEPA document may consider alternatives that are not within the jurisdiction of the airport sponsor or the FAA, such as the development of alternative airports or the use of other transportation modes. As stated previously, NEPA requires Federal agencies to "utilize a systematic, interdisciplinary approach which will insure the integrated use of the natural and social sciences and the environmental design arts in planning and decision making which may have an impact on man's environment." In preparing NEPA documents, FAA typically considers environmental impact, cost and other factors in its alternative analysis. It is possible that during the NEPA process, FAA will identify alternatives not previously considered during the planning process. Airport planners should be called upon to advise the environmental specialists on whether additional alternatives developed during the NEPA process meet planning needs and can be constructed and operated safely and efficiently.

h. **Currency of Aviation Forecasts**

A master plan uses locally generated aviation forecasts as the basis for identifying the need and timing of airport development. FAA reviews the local forecasts and forecast methodology to ensure that they are appropriate and that they provide an adequate justification for the scope, and timing of proposed airport development. Local forecasts developed in a master plan can be adopted for use in an environmental impact analysis provided that the FAA has approved them. FAA field offices can approve local forecasts if the forecast methodology is reasonable and the forecast is consistent with the FAA's Terminal Area Forecast (TAF) or differences with the TAF have been resolved by the FAA. Consistency with the TAF is discussed in separate planning guidance provided by the FAA, which also has special provisions for FAA approval of forecasts at lower activity general aviation airports. It is important that the local forecasts of aircraft activity and enplanements used in NEPA analysis were recently approved by the FAA and, in the process of approving these forecasts, the most recent published TAF was used for comparison.

It is also important that the same forecasts be used throughout project formulation including project justification, airfield modeling, environmental analysis, and benefit cost analysis. Where updated forecasts are approved, or separate forecasting used, the new information should be clearly distinguished from a prior forecast.

3. TOOLS

a. Planning Team

Airport planners, environmental specialists, and engineers should work together throughout the project formulation and development processes. This includes from the beginning of the master plan, through the preparation of an EA or EIS and subsequent decision document, as well as through design and construction to ensure that mitigation measures are properly accomplished. The team should first meet with the airport sponsor during pre-planning to insure that important issues are identified early. The extent of planner, environmental specialist and engineer involvement would depend on project complexity and controversy.

When preparation of an EA or EIS is anticipated, environmental specialists should take an active role in determining the adequacy of the master plan's alternative analysis. This ensures that the master plan and the EA or EIS are consistent in data and in rationale on the reasonable alternatives. In addition, the environmental specialist may assist the airport planner in reviewing the scope of work for the master plan relative to the scope of environmental work to be performed, provide guidance on developing the overview of sensitive environmental features, assist in developing and conducting the public consultation and help in deciding that project justification is sufficient to develop a strong and clear purpose and need statement in the EA or EIS. The airport sponsor's planning consultant should include, as part of their team, a specialist familiar with NEPA and environmental analysis requirements for airport projects.

The airport planner's role in the NEPA process is to: review the planning aspects of the NEPA document for accuracy and consistency with airport planning, design standards, operational requirements and land use compatibility considerations; review the adequacy of discussions of technological solutions that address the purpose and need; and review the consistency of the local aviation forecasts with the TAF and with the aviation forecasts used in other project documents.

During the planning and environmental analysis, engineers should provide conceptual engineering, if required, provide "planning-level" project cost estimates, and if required determine the constructability of various alternatives, including construction sequencing and timing.

b. Overview of Environmental Features

A recommended practice for the airport sponsor/consultant is to prepare an "overview of environmentally sensitive features of an airport" as part of the airport master plan. Such an overview can help an airport sponsor judge if the airport's environmental features affect day-to-day decisions as well as longer-term development strategies. The level of detail would be airport specific as determined by the sponsor and its consultant after consultation with the local FAA Airports office. The overview should include readily available information including:

- Items known from prior environmental and planning documents, and from the expertise of environmental professionals, community planners, and resource agencies
- Items that can be easily seen during a walking survey of the airport or off-airport area.
- Information from various types of available environmental resource maps of the airport area.

The findings from the literature search and airport walking survey should be documented.

This overview is not intended to substitute for the "Affected Environment" section of an EA or EIS. It is intended to provide information on, or an overview of obvious environmental resources, which could affect the planning of the proposed development. Therefore, it is not necessary to carry out substantial investigations such as cultural resource studies or wetland delineations in order to define all environmental factors needed for master planning. If an airport sponsor wishes to conduct such detailed studies under a master plan, the local FAA Airports office should be consulted. If concurrence is provided the FAA should work with the sponsor to ensure that the selected consultant is, or selected consultants are, experienced in the discipline(s) being investigated.

The overview should also include easily seen and/or readily documented environmental features and resources beyond the airport property line. The area of consideration beyond the property line will vary depending on the environmental resource. For noise, it may be set at the DNL 65 dB contour, while for coastal zones it may stretch well beyond the airport boundaries. A text of the environmental overview should be included in the master plan report together with appropriate graphics. Sensitive features may also be

shown on a separate ALP drawing. Attachment 3 to this appendix lists suggested features that may be included as parts of the overview. Information on land uses or features that surround the airport and whether or not such uses are zoned compatibly with aviation uses should also be included. If not zoned compatible, the reasons should be investigated and the sponsor should provide information on its efforts to promote aviation-compatible land uses near the airport.

The master plan report and/or ALP should note the source (i.e., May 2004 walking survey, NWI maps, 2003 regional land use plan, etc.) of flood plain, wetland, or cultural resource information that is presented. This will ensure that resource data that is approximate, such as wetland locations based on a recent walk-through or older NWI maps, is identified as approximate data. For example, a possible ALP note for wetlands is: "Wetland areas bounded by dashed lines are based on an April 2003 NWI map and March 19, 2004 walk-through of the area. The walk-through suggests wetland presence due to standing water and certain vegetation. The NEPA analysis will include a wetland delineation of that area, if alternatives under consideration are located in this area."

This information will alert planning and environmental reviewers of the possible presence of sensitive resources. As a result, further investigation of these areas during the NEPA process may be necessary. Project layout or design could change based on further information obtained during preparation of a NEPA document. The master plan report and/or ALP should clearly note if the environmental overview uses data more than five years old or of questionable quality.

An environmental overview may provide the information necessary to: 1) determine if additional alternatives are needed to avoid or minimize the impact of the project to sensitive environmental features; 2) define future environmental coordination and analysis work to develop more thorough work scope for an EA or EIS and; 3) properly understand the anticipated costs of preliminary/final design as well as how best to estimate the cost of and schedule for the NEPA process.

c. Electronic Data Information Systems

Airport sponsors typically have a great deal of spatial information to support infrastructure development. Although electronic data sources such as Computer Aided Design (CAD), Geographic Information Systems (GIS), and other spatial data formats are common, there is often redundancy due to a lack of knowledge about existing data sets and differing standards. A common data source is more efficient in the identification of environmentally sensitive features such as residential areas, parks, and hazardous waste sites and in quantifying the potential impact of various proposed development. Therefore, airport sponsors should consider developing an electronic spatial data standard for all planning, environmental, and engineering documents. Although GIS is typically used to implement such a standard, also consider other options that may offer more ready access and basic skill requirements should be considered.

Notwithstanding the above, hard copies of ALP drawings and master plan reports shall be provided for FAA retention and use.

d. If AIP or PFC funds are to be used for the development of a GIS or similar format, the scope of the GIS development should be discussed with the FAA to ensure that eligibility is established. See FAA Order 5100.38, *Airport Improvement Program Handbook*. The GIS should be in a standard format that is consistent with the data formats used by the surrounding units of government.

4. NEPA DOCUMENTS OF OTHER FEDERAL AGENCIES

An airport development proposal may require that a Federal agency other than the FAA is the lead agency for NEPA purposes. Although this usually involves development by a military entity, such as the Air National Guard, it may involve such actions as a roadway funded by the Federal Highway Administration, an apron/hangar for the U.S. Forest Service, or a recreational area by the Army Corps of Engineers. The master plan should recognize such proposed development, ensuring that the proposal is an appropriate use for the airport, and that the FAA's Federal actions associated with the development, such as ALP revisions or approval of land releases, are adequately addressed in the lead agency's NEPA document. The master plan should also describe how the proponent's potential plans would ultimately affect the airport sponsor's proposed airport development. FAA's environmental role will vary from project to project. Normally the FAA will be either a joint lead agency, or at least a cooperating agency during the preparation of an environmental document. The "other" Federal agency should come to FAA early to see what we look for in our environmental documentation and processing. Some laws, such as Section 4(f) of the DOT Act, or policies, such as noise, apply to FAA but not to other agencies, and must be addressed in the NEPA document.

ATTACHMENT D-1
ENVIRONMENTAL OVERVIEW FOR MASTER PLAN PURPOSES

Air Quality Classification	Attainment Area:	
	Non-attainment Area:	
	List Pollutant(s):	
	Maintenance Area:	
	List Pollutant(s):	
Aquatic Concerns	Bay:	Wetlands:
	Creek:	Floodplains:
	Ocean:	Potable Water Aquifer:
	Pond:	Sole-Source Aquifer:
	Habitat-Endangered/Threatened Species:	
	Drinking Water Reservoir:	
	Pond:	Streams:
	River:	Other:
Terrestrial Concerns	Contaminated Areas:	
	Habitat-Endangered/Threatened Species:	
	Farmland, Prime and Unique:	
	Hazardous Material Storage Areas:	
	Landfills:	
Cultural	Historic Properties*:	
	Archeological Resources:	
	Parks:	
	Wildlife Refuges:	
	Residential Areas:	
	Noise Sensitive Areas (church, school, hospital, etc.):	
	Other:	
Land Use Concerns	Traffic:	
	Noise:	
	Lighting:	
	Obstructions:	
	Environmental Justice:	
	Zoning:	

*Historic resources should be identified but the planning consultants should be wary of disclosing some information due to the sensitivity certain parties (i.e., Native Americans, Native Hawaiians) attach to these resources. A discussion should be held with these parties to decide if maps should include the identified resources.

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Appendix E Airport Site Selection

1. GENERAL

a. In some cases, the planner may determine that the existing airport cannot be expanded to meet the future demand and that a new or supplemental airport may be needed. In these cases, it may be necessary to look for a new airport site. The process of identifying, evaluating, and selecting new airport sites is very similar to the process of identifying, evaluating, and selecting alternatives for individual airport projects.

b. A comparison of new airport sites with the alternative of continuing operations at the existing airport may have been completed during the master plan alternatives analysis. In these cases, the site selection process may be a refinement of the preliminary investigation of alternatives for the existing airport. A site selection process may also result from the need for a new airport identified in a regional or state system plan study.

c. Prior to initiating a detailed site selection study, the planner should collect data that justifies the need for the new airport and its viability. Community and user support, along with an airport sponsor's legal and financial capability to build and operate the new airport, should be documented. There should be a consensus among Federal, state and local officials as to the intended role of the new airport, at least to the extent that its requirements and size can be determined. However, this does not rule out changing the role of the new airport as a result of the study findings.

2. SITE SELECTION PROCESS OVERVIEW

a. The scope of the site selection process will vary with the size, complexity, and role of the new airport. The sophistication of the analysis and the complexity of the decision making process can vary greatly.

b. If the planner determines that a new airport is needed, he or she should develop initial criteria that can be used to evaluate different sites and determine if each can function as an airport and meet the needs of the community and users. Such criteria might include that the sites are within a certain radius of the existing airport and are of a minimum size in terms of land area.

c. Once the preliminary sites have been identified, a screening process should be applied to each site. An evaluation of all potential sites that meet the initial criteria should be conducted, screening out those with the most obvious shortcomings. Screening factors might include topography, natural and man-made obstructions, airspace, access, environmental impacts, and development costs. If any sites are eliminated from further consideration, thorough documentation of the reasons for that decision is encouraged and will facilitate the subsequent environmental processing.

d. The remaining potential sites should then undergo a detailed comparison using comprehensive evaluation criteria. While the criteria will vary, the following should be considered:

- Operational Capability – the site should provide the operational capability necessary to serve the defined role of the airport and the needs of its users
- Capacity potential – If the new airport is needed to provide additional capacity, the capability of the site in providing long-term capacity growth is important.
- Ground access – an important factor is the ability of the users to get to and from the airport easily and in a timely manner.
- Development Costs – Simple cost estimates are useful in determining the financial feasibility of building a new airport.
- Environmental Consequences – The potential environmental impacts associated with a new site may be critical to gaining approval.

Consistency with Area-wide Planning – The site should be consistent with regional and local land use and transportation plans.

e. While a weighting of the evaluation criteria and a weighted ranking of the alternative sites may be used in selecting a site, planners should use caution in applying this technique since it introduces an element of subjectivity into the analysis. They should focus on providing decision makers with information on the various sites in a manner that is understandable and unbiased.

f. The site finally selected will be subject to the review of alternatives as required under NEPA. Planners will then make commitments on specific environmental mitigation measures. The selection will probably receive scrutiny through public information sessions, review by policy and advisory committees, and at public hearings.

g. The planner should not assume that the site selection process described here conclusively results in the selection of the best site. Overriding political, jurisdictional, institutional, environmental or financial considerations may influence the decision makers' choice of sites.

3. SITE APPROVAL

a. Once a site is selected, timely site approval by the airport sponsor who will develop and operate the new airport is important. Such action will permit the prompt establishment of the airport while the decision-making apparatus is politically and organizationally intact.

b. If state and regional approval procedures have been followed, an important next step will be Federal approval. FAA approval is necessary if planners intend to seek Federal financial assistance under the AIP for follow-on planning or site acquisition and development. Such approval must be supported by appropriate environmental documentation, public hearings, and evidence that the proposed airport will be reasonable consistent with local planning. The FAA must approve the selected site before any additional planning work is started.

c. Regardless of the applicability of Federal financial assistance in the planning or development of the airport, the FAA will advise on the aeronautical suitability of the site after having studied the site from the standpoint of airspace use as required by 14 CFR Part 157, *Notice of Proposed Construction, Alteration, Activation, and Deactivation of Airports.*

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Appendix F Airport Layout Plan Drawing Set

The following list provides general guidelines in preparing the Airport Layout Plan drawing set. The individual sheets that comprise the Airport Layout Plan drawing set will vary with each planning effort. During the project scoping activities, planners must determine which sheets will be necessary. Refer to ARP Standard Operating Procedure (ARP SOP) 2.00, Standard Procedure for FAA Review and Approval of Airport Layout Plans (ALPs), and ARP SOP 3.00, Standard Operating Procedure (SOP) for FAA Review of Exhibit 'A' Airport Property Inventory Maps, for specific ALP review and approval procedures and additional preparation guidance.

1. AIRPORT LAYOUT DRAWING

a. Sheet size – Minimum 24" x 36"

b. Scale –Within a range of 1" = 200' to 1" = 600'

c. North Arrow

1) True and Magnetic North

2) Year of the magnetic declination

3) Orient drawing so that north is to the top or left of the sheet

d. Wind Rose

1) Data source and the time period covered

2) Include individual and combined coverage for:

a) Runways with 10.5 knots crosswind

b) Runways with 13 knots crosswind

c) Runways with 16 knots crosswind

d) Runways with 20 knots crosswind

e. Airport Reference Point (ARP) – Existing and ultimate, with latitude and longitude to the nearest second based on NAD 83

f. Ground contours at intervals of 2' to 10', lightly drawn

g. Elevations (Existing and Ultimate to 1/10 of a foot)

1) Runway

2) Displaced thresholds

3) Touchdown zones

4) Intersections

5) Runway high and low points

6) Roadways where they intersect the RPZ edges and extended runway centerlines

7) Structures on Airport – If a terminal area plan is not included indicate structure top elevations on this sheet.

h. Building limit lines – Show on both sides of the runways and extend to the airport property line or RPZ.

i. Runway Details (Existing and Ultimate)

1) Runway Design Code (RDC) designation

2) Dimensions – length and width within the outline of the runway

3) Orientation – Runway end numbers and true bearing to the nearest 0.01 degree

4) Markings

5) Lighting – Threshold lights only

6) Runway Safety Areas – Dimensions may be included in the Runway Data Table

7) End Coordinates – Note near end (existing and ultimate) of each runway end, to nearest 0.01 second

8) Displaced threshold coordinates, to the nearest 0.01 second

9) Declared Distances – For each runway direction if applicable. Identify any clearway/stopway portions in the declared distances

j. Taxiway Details (Existing and Ultimate)

1) Taxiway Design Group (TDG) designation

2) Taxiway widths and separation from the runway centerlines, parallel taxiway, aircraft parking, and objects

k. RPZ Details (Existing and Ultimate)

1) Dimensions

2) Type of property acquisition (fee or easement)

l. Approach slope ratio (20:1; 34:1; 50:1)

m. Airport Data Table (Existing and Ultimate)

1) Airport elevation (MSL)

2) Airport Reference Point data

3) Mean maximum temperature

4) Airport Reference Code for each runway

5) Design Aircraft for each runway or airfield component

n. Runway Data Table (Existing and Ultimate)

1) Percent effective gradient

2) Percent wind coverage

3) Maximum elevation above MSL

4) Runway length and width

5) Runway surface type

6) Runway strength

7) FAR Part 77 approach category

8) Approach type

9) Approach slope

10) Runway lighting (HIRL, MIRL, LIRL)

11) Runway marking

12) Navigational and visual aids

13) RSA dimensions

o. Title and Revision Blocks

1) Name and location of the airport

2) Name of preparer

3) Date of drawing

4) Drawing title

5) Revision block

6) FAA disclaimer

7) Approval block

p. Other

1) Standard legend

2) Existing and Ultimate airport facility and building list

3) Location map

4) Vicinity map

2. AIRPORT AIRSPACE DRAWING

a. Plan view of all FAR Part 77 surfaces, based on ultimate runway lengths

b. Small scale profile views of existing and ultimate approaches

c. Obstruction data tables, as appropriate

d. Sheet size – same as the airport layout drawing

e. Scale – 1" = 2,000' for the plan view; 1" = 1,000' for approach profiles; and 1" = 100' (vertical) for approach profiles

f. Title and revision blocks - same as the airport layout drawing

g. Approach Plan View Details

1) USGS for base map

2) Show runway end numbers

3) Include 50' elevation contours on all slopes

4) Show the most demanding surfaces with solid lines and others with dashed lines

5) Identify top elevations of objects that penetrate any of the surfaces. For objects in the inner approach, add note "See inner portion of the approach plan view for close-in obstructions."

6) For precision instrument runways, show balance of 40,000' approach on a separate sheet.

h. Approach Profile Details

1) Depict the ground profile along the extended runway centerline representing the composite profile, based on the highest terrain across the width and along the length of the approach surface.

2) Identify all significant objects (roads, rivers, and so forth) and top elevations within the approach surfaces, regardless of whether or not they are obstructions

3) Show existing and ultimate runway ends and FAR Part 77 approach slopes.

3. INNER PORTION OF THE APPROACH SURFACE DRAWING

a. Large scale plan views of inner portions of approaches for each runway, usually limited to the RPZ areas

b. Large scale projected profile views of inner portions of approaches for each runway, usually limited to the RPZ areas

c. Interim stage RPZs when plans for interim runways extensions are firm and construction is expected in the near future

d. Sheet size – Same as Airport Layout drawing

e. Scale – Horizontal 1" = 200'; vertical 1" = 20'

f. Title and revision blocks – Same as for Airport Layout drawing

g. Plan View Details

1) Aerial photos for base maps

2) Numbering system to identify obstructions

3) Depict property line

4) Identify, by numbers, all traverse ways with elevations and computed vertical clearance in the approach

5) Depict the existing and ultimate physical end of the runways. Note runway end number and elevation

6) Show ground contours, lightly drawn

h. Profile View Details

1) Depict terrain and significant items (fences, roadways, and so forth)

2) Identify obstructions with numbers on the plan view

3) Show roads and railroads with dashed lines at edge of the approach

i. Obstruction Table Details

1) Depict terrain and significant items (fences, roadways, and so forth)

2) Identify obstructions with numbers on the plan view

3) Show roads and railroads with dashed lines at edge of the approach

4) Prepare a separate table for each RPZ

5) Include obstruction identification number and description, the amount of the approach surface penetration, and the proposed disposition of the obstructions

4. TERMINAL AREA DRAWING

The need for this drawing will be decided on a case-by-case basis. For small airports, where the Airport Layout drawing is prepared to a fairly large scale, a separate drawing for the terminal area may not be needed.

a. Large scale plan view of the area or areas where aprons, buildings, hangars, and parking lots are located

b. Sheet size – Same as Airport Layout drawing

c. Scale – Range of 1” = 50’ to 1” = 100’

d. Title and revision blocks – Same as for Airport Layout drawing

e. Building Data Table – To list structures and show pertinent information about them. Include space and columns for:

1) A numbering system to identify structures

2) Top elevation of structures

3) Existing and planned obstruction markings

5. LAND USE DRAWING

a. Include all land uses (industrial, residential, and so forth), on and off the airport, to at least the 65 DNL contour

b. Sheet size – Same as Airport Layout drawing

c. Scale – Same as the Airport Layout drawing

d. Title and revision blocks – Same as for Airport Layout drawing

e. Aerial base map

f. Legend (symbols and land use descriptions)

g. Identify public facilities (such as schools, parks, and others)

h. Drawing details – Normally limited to existing and future airport features (i.e., runways, taxiways, aprons, RPZs, terminal buildings and navigational aids)

6. RUNWAY DEPARTURE SURFACES DRAWING

a. Large scale plan views of departure surfaces for each runway end that is designated primarily for instrument departures. The one-engine inoperative (OEI) obstacle identification surface (OIS) should be shown for any departure runway end supporting air carrier operations.

b. Large scale projected profile views of departure surfaces for each runway that is designated primarily for instrument departures.

c. Sheet size – Same as Airport Layout drawing

d. Scale – Horizontal 1" = 1000'; vertical 1" = 100' (runway departure surfaces); and Scale – Horizontal 1" = 2000'; vertical 1" = 100' (OEI obstacle identification surfaces)

e. Title and revision blocks – Same as for Airport Layout drawing

j. Plan View Details

7) Aerial photos for base maps

8) Numbering system to identify obstructions

9) Depict property line, including easements

10) Identify, by numbers, all traverse ways with elevations and computed vertical clearance in the departure surface

11) Depict the existing and ultimate physical end of the runways. Note runway end number and elevation

12) Show ground contours, lightly drawn

k. Profile View Details

4) Depict terrain and significant objects, including fences, roadways, rivers, structures, and buildings.

5) Identify obstructions with numbers on the plan view

6) Show roads and railroads with dashed lines at edge of the departure surface

l. Obstruction Table Details

6) Depict terrain and significant objects, including fences, roadways, rivers, structures and buildings

7) Identify obstructions with numbers on the plan view

8) Show roads and railroads with dashed lines at edge of the approach

9) Prepare a separate table for each departure surface

10) Include obstruction identification number and description, the amount of the departure surface penetration, and the proposed disposition of the obstructions

7. AIRPORT PROPERTY MAP

a. Sheet size – Same as Airport Layout drawing

b. Scale – Same as the Airport Layout drawing

c. Title and revision blocks – Same as for Airport Layout drawing

d. Legend

e. Data Table

1) A numbering or lettering system to identify tracts of land

2) The date the property was acquired

3) The Federal aid project number under which it was acquired

4) Type of ownership (fee, easement, federal surplus, and others)

f. Show existing and future airport features (i.e., runways, RPZs, navigational aids and so forth) that would indicate a future aeronautical need for airport property.

SciTechDaily

EARTH

The West Coast Is at Risk: New Megathrust Fault Research Indicates That the Next Big Earthquake Could Be Imminent

BY COLUMBIA CLIMATE SCHOOL — AUGUST 28, 2024 65 COMMENTS 7 MINS READ

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New research on the Cascadia Subduction Zone shows it has a segmented fault structure, impacting earthquake predictions and preparedness strategies, potentially affecting building codes in vulnerable areas like Washington's Olympic Peninsula. Credit: SciTechDaily.com

Large-scale earthquakes and tsunamis have historically affected the western regions of the U.S. and Canada and are likely to do so in the future.

Off the southern coasts of British Columbia, Washington, Oregon, and northern California, a 600-mile-long strip exists where the Pacific Ocean floor gradually subducts eastward beneath North America.

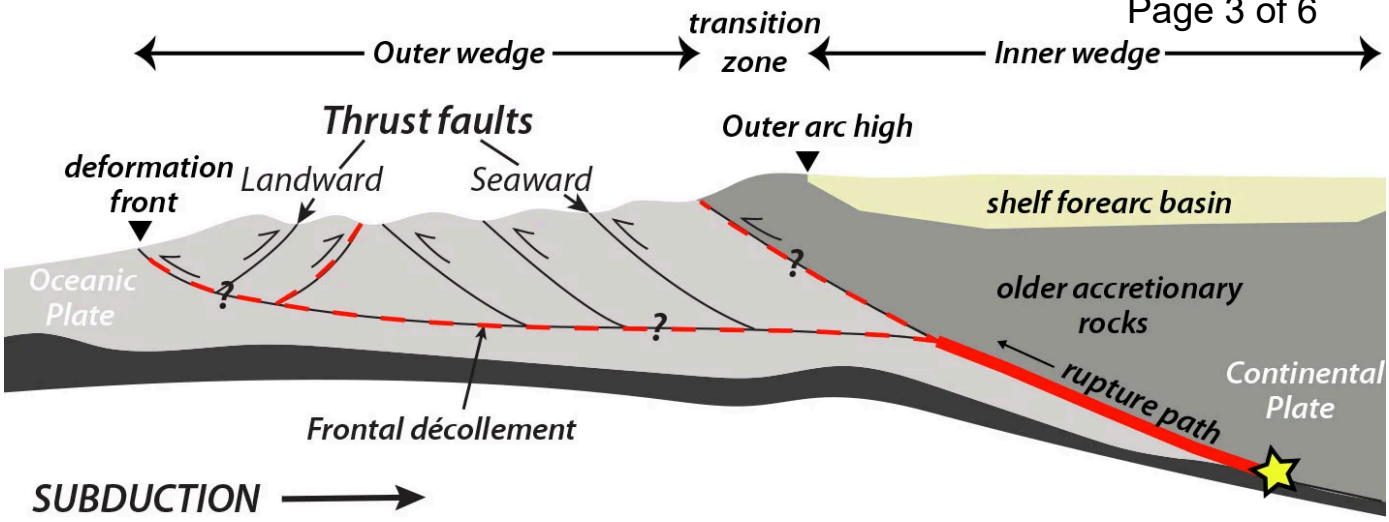
This area, called the Cascadia Subduction Zone, hosts a megathrust fault, a place where tectonic plates move against each other in a highly dangerous way. The plates can periodically lock up and build stress over wide areas—eventually to be released when they finally lurch against each other.

The result: the world's greatest earthquakes, shaking both seabed and land, and generating tsunamis 100 feet high or more. Such a fault off Japan caused the 2011 Fukushima nuclear disaster. Similar zones exist off Alaska, Chile, and New Zealand, among other places. At Cascadia, big quakes are believed to come roughly every 500 years, give or take a couple hundred. The last occurred in 1700.

Research Advancements in Understanding Seismic Activity

Scientists have long been working to understand the Cascadia Subduction Zone's subterranean structures and mechanics, in order to delineate places most susceptible to quakes, how big they might be, and what warning signs they might produce. There is no such thing as predicting an earthquake; rather, scientists try to forecast probabilities of multiple scenarios, hoping to help authorities design building codes and warning systems to minimize the damage when something happens.

A newly published study promises to greatly advance this effort. A research vessel towing an array of the latest geophysical instruments along almost the entire zone has produced the first comprehensive survey of the many complex structures beneath the seafloor. These include the geometry of the down-going ocean plate and overlying sediments, and the makeup of the overriding North American plate. The study was recently published in the journal *Science Advances*.



A schematic cross-section of the Cascadia Subduction Zone shows the ocean floor plate (light grey) moving under the North American continental plate, along with other features. Credit: U.S. Geological Survey

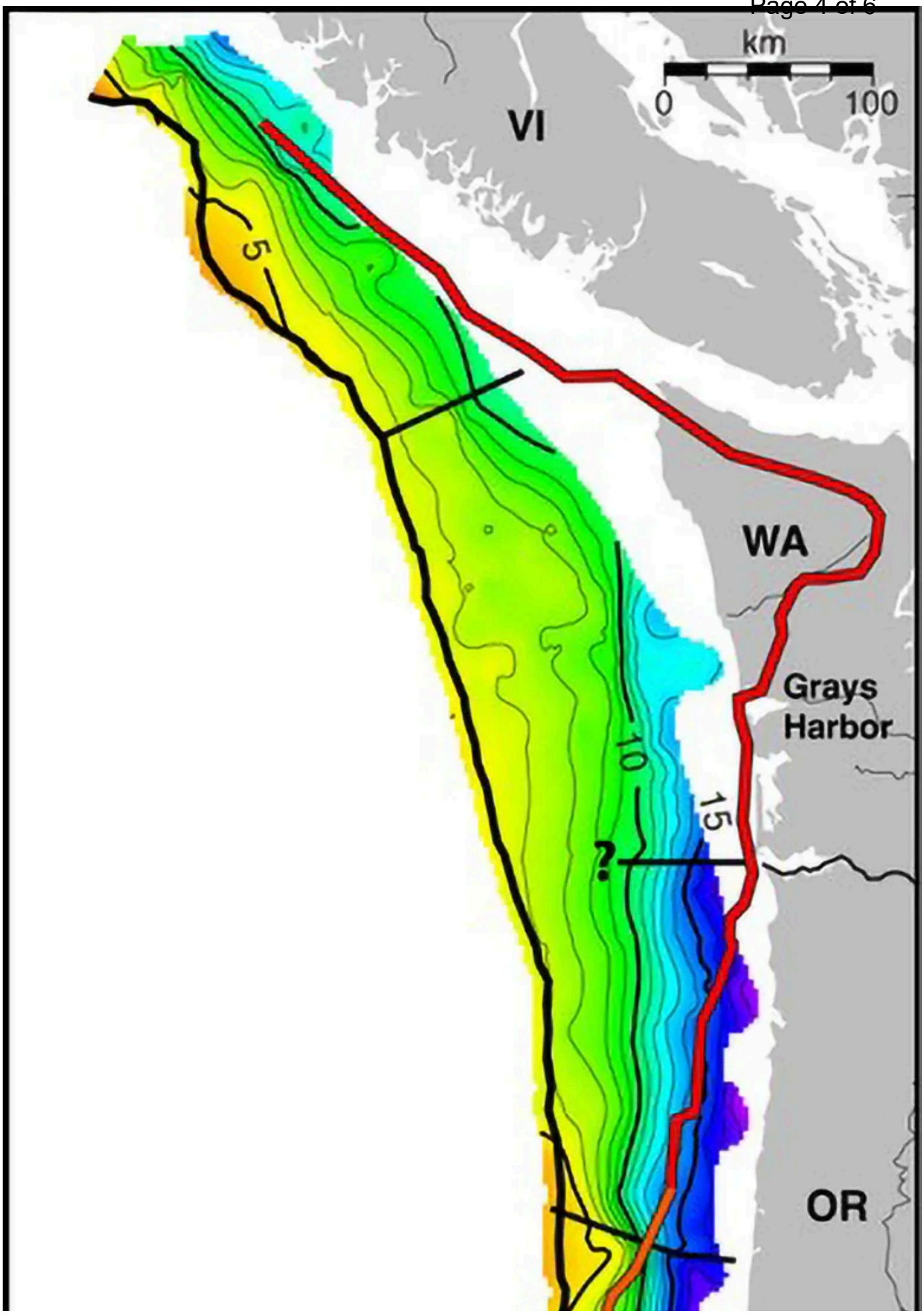
"The models currently in use by public agencies were based on a limited set of old, low-quality 1980s-era data," said Suzanne Carbotte, a marine geophysicist at Columbia University's Lamont-Doherty Earth Observatory, who led the research. "The megathrust has a much more complex geometry than previously assumed. The study provides a new framework for earthquake and tsunami hazard assessment."

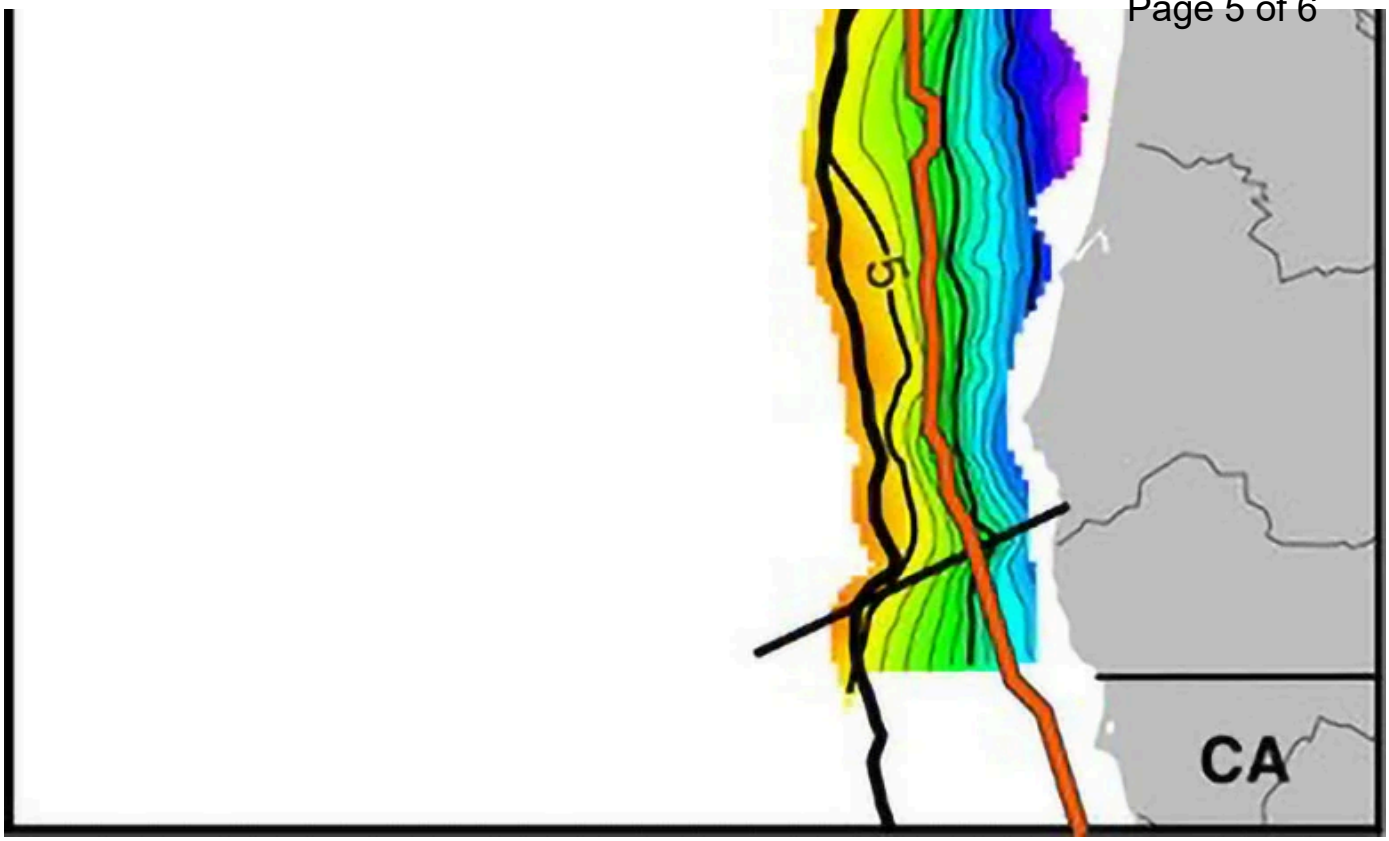
With funding from the U.S. National Science Foundation, the data was gathered during a 41-day cruise in 2021 by Lamont's research vessel, the Marcus G. Langseth. Researchers aboard the ship penetrated the seafloor with powerful sound pulses and read the echoes, which were then converted into images, somewhat similar to how physicians create interior scans of the human body.

New Insights into Fault Segmentation and Tsunami Risks

One key finding: the megathrust fault zone is not just one continuous structure, but is divided into at least four segments, each potentially somewhat insulated against the movements of the others. Scientists have long debated whether past events, including the 1700 quake, ruptured the entire zone or just part of it — a key question, because the longer the rupture, the bigger the quake.

The data show that the segments are divided by buried features including big faults, where opposing sides slide against each other perpendicular to the shore. This might help buffer against movement on one segment translating to the next. "We can't say that this definitely means only single segments will rupture, or that definitely the whole thing will go at once," said Harold Tobin, a geophysicist at the University of Washington and co-author of the study. "But this does upgrade evidence that there are segmented ruptures."


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Sub-seafloor map of the Cascadia Subduction Zone, showing depth of the fault between the eastward-moving Juan de Fuca place and the North American plate. Yellow/orange indicates shallow depths; green, deeper; blues/purples deepest. Diagonal black lines approximate divisions between different segments of the zone. The wavy red line to the right indicates the seaward edge of rigid continental rocks that apparently cause the zone to break into these segments. Credit: Modified from Carbotte et al., Science Advances, 2024

The imagery also suggests the causes of the segmentation: the rigid edge of the overriding North American continental plate is composed of many different kinds of rocks, formed at different times over many tens of millions of years, with some being denser than others. This variety in the continental rocks causes the incoming, more pliable oceanic plate to bend and twist to accommodate differences in overlying pressure. In some places, segments go down at relatively steep angles, in others at shallow ones.

The researchers zeroed in on one segment in particular, which runs from southern Vancouver Island alongside Washington state, more or less ending at the Oregon border. The subterranean topography of other segments is relatively rough, with oceanic features like faults and subducted seamounts rubbing up against the upper plate — features that might erode the upper plate and limit how far any quake may propagate within the segment, thus limiting the quake's size. In contrast, the Vancouver-Washington segment is quite smooth. This means that it may be more likely to rupture along its entire length at once, making it potentially the most dangerous section.

Ongoing Research and Implications for Regional Safety

Also in this segment, the seafloor is subducting under the continental crust at a shallow angle relative to the other segments. In the other segments, most of the earthquake-prone interface between the plates lies offshore, but here the study found the shallow subduction angle means it probably extends directly under Washington's Olympic Peninsula. This might magnify any shaking on land. "It requires a lot more study, but for places like Tacoma and Seattle, it could mean the difference between alarming and catastrophic," said Tobin.

With funding from the U.S. Geological Survey, a consortium of state and federal agencies and academic institutions has already been poring over the data since it became available to sort through the implications.

As for tsunami hazard, that is "still a work in progress," said Kelin Wang, a research scientist at the Geological Survey of Canada who was not involved in the study. Wang's group is using the data to model features of the seafloor off Vancouver Island that might generate tsunamis. (In general, a tsunami occurs when the deep seafloor moves up or down during a quake, sending a wave to the surface that concentrates its energy and gathers height as it reaches shallower coastal waters.) Wang said his results will go to another group that models tsunamis themselves, and after that to another group that analyzes the hazards on land.

Practical assessments that could affect building codes or other aspects of preparedness may be published as early as next year, say the researchers. "There's a whole lot more complexity here than was previously inferred," said Carbotte.

Reference: "Subducting plate structure and megathrust morphology from deep seismic imaging linked to earthquake rupture segmentation at Cascadia" by Suzanne M. Carbotte, Brian Boston, Shuoshuo Han, Brandon Shuck, Jeffrey Beeson, J. Pablo Canales, Harold Tobin, Nathan Miller, Mladen Nedimovic, Anne Tréhu, Michelle Lee, Madelaine Lucas, Hanchao Jian, Danqi Jiang, Liam Moser, Chris Anderson, Darren Judd, Jaime Fernandez, Chuck Campbell, Antara Goswami and Rajendra Gahlawat, 7 June 2024, *Science Advances*.
DOI: 10.1126/sciadv.adl3198

The study was funded by the U.S. National Science Foundation.

Columbia University Earthquakes Oceanography Tsunami


Exhibit M
Columbia Aviation Association
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Advanced Air Mobility (AAM) Implementation Plan

Near-term (Innovate28) Focus with an Eye on the Future of AAM

Version 1.0 / July 2023





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Table of Contents

1 Advanced Air Mobility 1
1.1 AAM Definition 1
1.2 AAM Integration into the National Airspace System 1
1.3 Stakeholder Collaboration 2
2 Introduction to Innovate28 5
3 Implementation Plan Overview 6
4 Innovate28 Key Site Operations 7
4.1 AAM Aircraft 7
4.2 AAM Operations 8
4.3 I28 Scenario 13
5 Innovate28 Workstreams 15
5.1 Certification 15
5.2 Operational Suitability 15
5.2.1 Operations Certification 16
5.2.2 Aircraft Certification 18
5.3 Airspace and Air Traffic Management 20
5.4 Infrastructure 22
5.4.1 Existing Infrastructure 22
5.4.2 New Infrastructure 23
5.4.3 Vertiport-Related Research 23
5.4.4 Vertiport Standards and Oversight 24
5.5 Environment 25
5.6 Hazardous Materials Safety 26
5.7 Community Engagement 27
6 Innovate28 Integrated Schedule 28
7 AAM Evolution Framework 31

List of Figures

Figure 1. Integrated Master Schedule Version 1.0..... 29

List of Tables

Table 1. Detailed List of Activities in the Integrated Master Schedule Version 1.0 30
Table 2. AAM Coordination Areas..... 32
Table 3. AAM Maturity Levels..... 33

1 Advanced Air Mobility

Transportation is constantly evolving, and each step forward yields new opportunities that fundamentally change how people and goods are being transported. A new era of aviation once only portrayed in movies or science fiction is taking off. Advanced Air Mobility (AAM) is an emerging aviation ecosystem that leverages new aircraft and an array of innovative technologies to provide the opportunity for more efficient, more sustainable, and more equitable options for transportation.



1.1 AAM Definition

As defined in the AAM Coordination and Leadership Act (P.L. 117-203, 136 Stat. 2227), October 17, 2022, "AAM is a transportation system that moves people and property by air between two points in the United States (U.S.) using aircraft with advanced technologies, including electric aircraft, or electric vertical takeoff and landing (eVTOL) aircraft, in both controlled and uncontrolled airspace." For purposes of this Implementation Plan, however, the scope of AAM is limited to those engaging in passenger-carrying or cargo operations with a pilot on board.

1.2 AAM Integration into the National Airspace System

The Federal Aviation Administration (FAA) has a long, successful history of bringing new technologies safely into aviation. The agency's role in integrating AAM into the National Airspace System (NAS) is to ensure this new generation of aircraft maintains the highest level of operational safety that defines commercial aviation today. The FAA's top priority and statutory responsibility are to ensure the safety of the traveling public. The agency is

looking at every necessary aspect to support AAM flights: the aircraft itself, the framework for operations, access to the airspace, operator training, infrastructure development, environmental impacts, and community engagement.



As these aircraft are being developed, the FAA will amend, as appropriate, operational rules and pilot training requirements. Longer term, the agency will develop permanent regulations to safely enable powered lift operations and pilot training and certification.

The FAA is implementing a crawl-walk-run methodology that recognizes early opportunities to support Entry into Service (EIS) operations through existing services and infrastructure with minimal changes. The agency is doing this while developing a path to implementation of more advanced concepts and capabilities to support increasing scale and automation of AAM operations, as well as integration with other types of aircraft operating in the NAS.

To address the development of a near-term ecosystem, the FAA created Innovate28 (I28), a joint government and industry initiative that will culminate in integrated AAM operations at one or more key site locations by the 2028 timeframe. The FAA also recognizes and has begun executing the collaborative actions needed to mature AAM concepts, operations, and regulatory frameworks beyond initial operations and into the mid-term and mature state phases (see Section 7). This Implementation Plan shows how the agency expects all these pieces to come together to allow the industry to scale safely.

1.3 Stakeholder Collaboration

Operationalizing AAM in the NAS and establishing timelines from EIS to operations at scale requires collaboration with, and commitments by, many stakeholders to ensure safe, efficient, and equitable operations, including:

Federal Aviation Administration

From a federal level, the FAA has sole and exclusive authority over all aviation safety aspects of AAM integration, including operating rules, aircraft certification, and pilot certification. The agency provides a leadership role in identifying and integrating the responsibilities of all the key actors and stakeholders. The FAA develops and processes all certification, policy and procedures, rulemaking, and regulatory activities to ensure safety of flight, and strives to ensure that industry (including original equipment manufacturers (OEMs), aircraft operators, and vertiport operators) and local, state, and tribal governments can accommodate AAM operations and plan accordingly.

In support of I28, the FAA established internal workstreams, called iTeams. These teams are dedicated to addressing major focus areas for AAM integration, including Certification, Airspace and Air Traffic Management, Infrastructure, Environment, Hazardous Materials Safety, and Community Engagement, to ensure a coordinated approach for I28 operations.

Other Government Agencies

The FAA is leveraging existing programs and research conducted by other government agencies to integrate AAM more rapidly into the NAS, including the National Aeronautics and Space Administration (NASA), U.S. Department of Transportation (DOT), Department of Defense, and others. For example, through the FAA's extensive AAM-focused partnership with NASA's AAM Program and the National Campaign and collaboration with the U.S. Air Force AFWERX Prime programs, the FAA is able to leverage the research, data, and testing experience in the shared mission to safely integrate AAM aircraft.

In addition to collaboration at the federal level, the FAA is engaging with local, state, tribal, and territorial governments that have vested interests in making decisions to ensure safe and successful AAM operations from local and regional planning, power infrastructure, intermodal transportation, and community perspectives. These entities will likely be responsible for the coordination, logistics, zoning, licensing of infrastructure, and the community engagement necessary to support AAM operations.

Inter-Agency Working Groups

The FAA participates in several inter-agency AAM groups, including the DOT AAM Interagency Working Group, which was established by the AAM Coordination and Leadership Act. Much like the FAA iTeams' structure, the DOT AAM Interagency Working Group is coordinating efforts related to safety, operations, infrastructure, physical security and cybersecurity, and federal investment necessary for maturation of the AAM ecosystem in the U.S. They are focused on ensuring cohesive and consistent Executive Branch-wide policy through a collaborative and proactive approach that supports the FAA's integration of AAM into the NAS.

The FAA also participates in the newly-formed International Civil Aviation Organization (ICAO) AAM Study Group. The 41st ICAO Assembly recognized that the rapidly evolving AAM ecosystem requires a globally harmonized operational and regulatory framework and guidance. ICAO provides the forum for 26 international stakeholders to develop a holistic vision and framework to achieve global harmonization and interoperability of AAM implementation, allowing all countries to benefit from the AAM operations. The FAA and other government agencies participate in all relevant ICAO technical panels that will ultimately work on international standards and recommended practices for AAM as the specific work is forwarded for their action from the AAM Study Group.

AAM Operators and Manufacturers

Companies developing or operating AAM aircraft are key stakeholders in the integration process. These companies will need to work with government agencies to bring forward the use cases and locations of interest, obtain necessary certifications and approvals, and ensure that their aircraft and operations meet safety and regulatory requirements. They will also need to consider the environmental impacts of their aircraft and operations, engage with relevant communities, and minimize environmental and other impacts on communities.

Infrastructure Providers

Any time new transportation is introduced, communities must plan for the integration of those operations either within existing infrastructure or through the development of new facilities. Companies that provide charging stations, vertiports, and other infrastructure necessary for AAM operations will also play a role in integration. Providers of private infrastructure that do not require FAA approval will, in particular, need to engage with relevant communities, minimize environmental and other impacts on communities, and foster community support.

Communities and the Public

As AAM aircraft begin to operate in urban areas, communities and the general public will be affected by these new technologies, capabilities, and services. Community involvement is the process of engaging in dialogue and collaboration with communities affected by FAA actions. This process supplements the public involvement activities required under other laws or requirements. Public engagement and education through involvement of all stakeholders will be necessary to ensure that communities understand the benefits and impacts of AAM operations, and to address any concerns they may have. The AAM industry offers the prospects of convenient alternatives to traditional transportation, as well as increased access to air transportation. However, for this emerging industry to reach its fullest potential, it must gain the support of the general public. The FAA encourages communities to get involved now in these early phases, and to stay engaged.

2 Introduction to Innovate28



On May 3, 2023, the FAA released Version 2.0 of the Urban Air Mobility (UAM) Concept of Operations (ConOps) that describes the technical roadmap for enabling UAM, which is an urban-focused subset of AAM, from the near-term to far-term. The focus of this Implementation Plan, Version 1.0, is to document the work required to enable initial AAM operations in a variety of operational settings or "key sites" in the near-term.

Initial Integration of AAM Operations at One or More Key Sites

Innovate28 (I28) is an FAA initiative that will culminate in integrated AAM operations with OEMs and/or operators flying between multiple origins and destinations at one or more locations in the U.S. by 2028. I28 marks one milestone on the AAM evolutionary continuum and the path to full integration and operations at scale across the NAS. I28 will leverage public-private partnerships to identify key locations and use cases of interest to AAM industry stakeholders while promoting an all-hands-on deck approach to ensure the necessary steps are taken to enable these operations. Leveraging lessons learned from OEMs and/or operators conducting individual EIS building block operations, I28 operations are expected to be larger in scale than initial EIS operations. I28 is intended to result in "leave behind" processes, infrastructure, procedures, and local knowledge at the key site(s). Additionally, the collective experience gained through the I28 initiative is expected to support expanded operations in other areas of the country.

Repeatable Implementation Methodology

The I28 implementation approach includes documenting steps and protocols and collecting data over the course of the effort to develop a repeatable methodology, including processes, procedures, and mechanisms, for expanding AAM operations to other locations across the NAS. This methodology will be used as a guide for future sites to collaborate with the FAA and other stakeholders to streamline implementation of AAM solutions. The FAA will also leverage the I28 efforts, as well as the EIS building blocks, in its ongoing work to evolve and advance AAM into the future.

3 Implementation Plan Overview

This AAM Implementation Plan is a living document that will guide implementation efforts and mature as the FAA works with stakeholders to refine and execute AAM implementation strategies. It will be updated periodically to reflect the continued plans and progress with AAM integration, roadmaps, and schedules for I28 and beyond as work continues to advance towards the mature state vision of AAM operations across the NAS.



Version 1.0 provides details for the near-term I28 initiative, which will enable a repeatable AAM ecosystem at key locations based on information known to date. The evolution of AAM beyond I28 is also previewed. Version 1.0 specifically addresses the following:

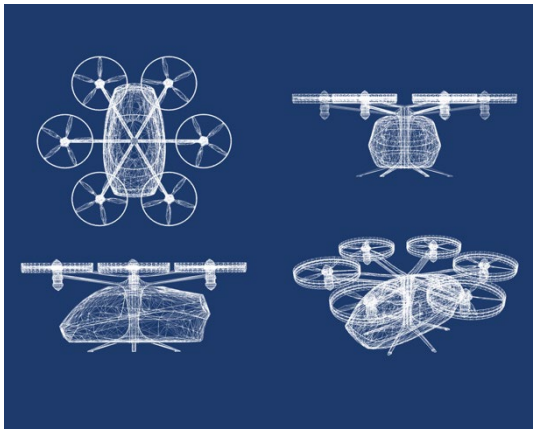
- **I28 Key Site Operations**
  - Description of the operating environment in 2028 based on assumptions and expectations of AAM aircraft and operations, including a scenario thread for a generic key site location
  - Overarching framework that FAA stakeholders can use to identify and work through key challenge areas, executing to a common vision
- **I28 Workstreams**
  - Holistic approach to the required efforts, both internal and external to the FAA, needed to meet I28 goals (presented in Section 2)
  - Descriptions of work completed to date and gaps to be addressed in Certification, Airspace and Air Traffic Management, Infrastructure, Environment, Hazardous Materials Safety, and Community Engagement
- **I28 Integrated Master Schedule**
  - Detailed schedule across workstream focus areas that supports I28 operations and leave behind processes
  - Tool for tracking the milestones of internal and external stakeholders (e.g., tribal/state/local government, and industry) who manage their own activities relevant to implementation at specific site(s)
- **AAM Evolution Framework**
  - High-level view of the evolution of AAM operations and an associated framework for the continued development and commitments that are needed to advance AAM integration in the NAS

4 Innovate28 Key Site Operations

The I28 initiative envisions a near-term AAM operational ecosystem that has advanced from EIS at various locations to substantive presence at locations of interest. Since AAM aircraft are currently undergoing or are being planned to undergo the certification process, and specific operational needs are still being defined, it is necessary to make assumptions as to how the AAM industry will operate and what the supporting capabilities will be in 2028. The I28 key site operations presented here are based on industry and FAA projections on the state of technology development, air and ground supporting infrastructure and services, and other capabilities. These assumptions will continue to be updated in future versions of this document as the industry advances and regulations are developed.

The following addresses the assumptions and expectations about AAM aircraft with respect to certification and operating characteristics. I28 AAM operations are then described in the context of the operating environment, including flight operations, airspace usage and route structure, air traffic control (ATC) services, and infrastructure. A scenario thread is also presented for an I28 AAM operation.

4.1 AAM Aircraft



For I28, AAM aircraft will be authorized for piloted operations and will transport passengers and/or cargo within the limits of the aircraft and certification regulations. The aircraft are expected to range in size from single passenger to larger occupancy shuttles, and employ new means of propulsion (e.g., electric motors, hydrogen fuel, hybrid designs). Many are capable of vertical takeoff and landing (VTOL) or short takeoff and landing (STOL) operations and quickly transition to fixed-wing operation after takeoff. It is assumed wake characteristics will be known, including the impacts of wake from other aircraft on AAM aircraft and an AAM aircraft's own wake generation.

AAM aircraft are expected to be type certificated as special class under 14 Code of Federal Regulations (CFR) § 21.17(b). Because these aircraft have novel airframes and powerplants, the FAA is using many of the performance-based regulations in 14 CFR part 23, *Airworthiness Standards: Normal Category Airplanes*, for the certification basis. AAM commercial operators are expected to be certified to operate under 14 CFR part 135, *Operating Requirements: Commuter and on Demand Operations and Rules Governing Persons on Board Such Aircraft*. Pilots of powered lift aircraft are expected to be rated (type rated as required) for each powered lift aircraft they fly, and they will be required to meet updated qualification requirements for operating under part 135.



AAM aircraft are expected to operate under part 135, including seeking FAA approval for the carriage of dangerous goods and hazardous materials, consistent with the aircraft's type certificated operating weight to include passenger carriage or cargo capability and their frequency of operations. These operations must be part of the operator's FAA approved Dangerous Goods program and further authorized within the operator's Operations Specifications.

4.2 AAM Operations

The descriptions of I28 AAM operations in this section are agnostic to location. As key sites are identified, site-specific airspace and air traffic management (ATM) solutions will be developed for operations within defined geographical areas based on AAM operator use cases.

Airspace Usage and Route Structure

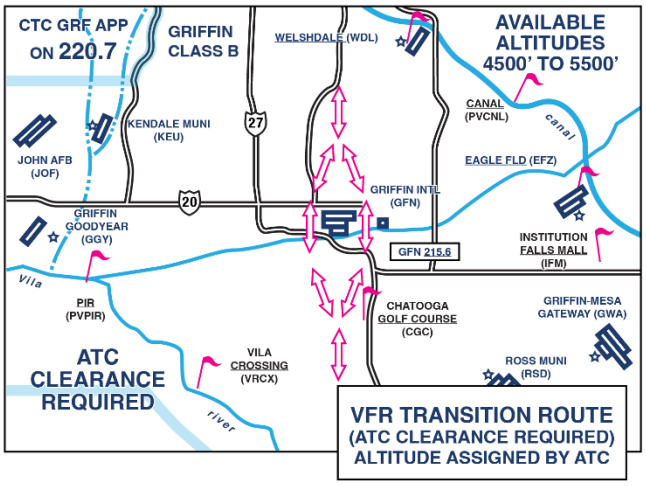
AAM operators are expected to comply with existing communication, navigation, and surveillance (CNS) requirements for the airspace in which they will operate. For I28, the expectation is that the aircraft will operate from the surface to 4000' above ground level in urban and metropolitan areas, and in relatively close proximity to or directly on airports. This means that AAM aircraft will operate predominately in or around Class B and C airspace.

To operate within Class B airspace, pilots must receive ATC clearance, and aircraft are required to be equipped with an operating two-way radio, Automatic Dependent Surveillance – Broadcast (ADS-B) Out, suitable navigation capability, and an operable transponder with altitude reporting capability. Initial AAM aircraft operations are generally expected to operate in compliance with Visual Flight Rules (VFR) weather minima in visual meteorological conditions (VMC).

VFR aircraft operating within Class B airspace receive separation services from ATC. VFR aircraft may obtain an ATC clearance to transit Class B airspace, if needed, however, the FAA encourages VFR pilots to operate above or below, or transit Class B airspace using established VFR corridors. To operate within Class C airspace, pilots must initiate two-way radio communications prior to entry and maintain communications while in the airspace. They must also be equipped with a two-way radio and an operable transponder with altitude reporting capability.

The addition of AAM operations will add to the already busy traffic levels of Class B and C airspace. In cases where existing VFR procedures do not meet the needs of air traffic facilities or AAM operators, special agreements or coordination may need to occur to

accommodate the increase in traffic levels. Ideally, agreements made at the local level will reduce ATC workload.



Charted routes will be the primary routing structure used by AAM aircraft. This approach enables the FAA to develop routes that accommodate AAM operator needs while leveraging the existing design and charting processes. The development of airspace route structures for I28 operations will consider design standards based on 14 CFR parts 135 and 91, *General Operating and Flight Rules*, local procedures, terrain, and traffic flows. Pilot adherence to charted I28 routes and the recommended altitudes or flight ceilings associated with them are voluntary. However, ATC may assign charted routes and altitudes where pilot compliance is required, provided such procedures are called for in specific FAA-operator Letters of Agreement (LOAs), or are necessitated by traffic density and/or safety considerations. ATC may also restrict operations within designated operating zones when certain criteria are met, and as requested by the appropriate authorities. Noise and other environmental considerations are accounted for in the airspace design. Changes to airspace design and/or new routes will likely require the FAA to conduct environmental review and community outreach.

I28 AAM routes will be designed for use in VFR conditions only, and where possible, use existing or modified low altitude VFR routes and constructs. While these routing constructs do not inherently provide separation or segregation of participating AAM traffic, they are developed to assist pilots in avoiding major controlled traffic flows. The routes[1] may include:

- **VFR flyways** - General flight paths not defined as a specific course, for use by pilots in planning flights into, out of, through or near complex terminal airspace to avoid Class B airspace. An ATC clearance is not required to fly these routes.
- **VFR corridors** - Airspace through Class B airspace, with defined vertical and lateral boundaries, in which aircraft may operate without an ATC clearance or communication with ATC.

[1] *https://www.faa.gov/air_traffic/publications/atpubs/aim_html/chap3_section_5.html*

- **VFR transition routes -** Specific flight courses depicted on a terminal area chart for transiting a specific Class B airspace. These routes include specific ATC-assigned altitudes, and pilots must obtain an ATC clearance prior to entering Class B airspace on the route.

- **Special flight rule areas** - Airspace of defined dimensions, above land areas or territorial waters, within which the flight of aircraft is subject to the rules set forth in 14 CFR Part 93, unless otherwise authorized by ATC.

I28 AAM routes may include non-published routes. They may also require development of new routes. More information is needed to make this determination; it may be a combination of existing and new route structures until a specific AAM route process can be developed. It is important to note, however, that no unique AAM airspace structures (e.g., dedicated AAM airspace corridors) or procedures are expected to be implemented by this 2028 timeframe.

Efforts will be made when developing and designating AAM routes to ensure, to the extent possible, that the flow of AAM traffic does not negatively impact or interfere with other air traffic flows or other airspace available to ATC today. In some cases, this may be unavoidable, and operational efficiency will need to be considered. As previously noted, these routing constructs do not inherently provide separation or segregation of AAM traffic, therefore see-and-avoid will continue to be the primary means of aircraft separation.

Air Traffic Control Services

For I28, ATC services will be provided to AAM operators as needed or required and are defined in FAA regulations, directives, and agreements (e.g., FAA Order Joint Order (JO) 7110.65, *Air Traffic Control*, LOAs, Memorandums of Understanding (MOU), Notices to Air Missions (NOTAM), and Advisory Circulars (AC)). AAM operations may require an LOA covering local procedures or routes, establishment of reserved discrete beacon codes, and use of abbreviated call signs.

The following lists the expectations of ATC and OEMs/operators with respect to operations at designated key site locations.

- AAM operators comply with the appropriate CFR pertaining to ATC or apply for a waiver/exemption.

- AAM operations are expected to be conducted with flight schedules that are predetermined. Schedules are provided in advance of operations and coordinated with local ATC and all other identified stakeholders.

- The pilot has two-way radio communication with ATC when required.

- VFR aircraft operating within Class B airspace receive mandatory traffic advisories and safety alerts, as well as separation services where required.

- VFR aircraft operating in Class C airspace receive sequencing services and ATC separates IFR aircraft from the VFR aircraft. VFR aircraft receive traffic advisories and safety alerts. VFR pilots retain responsibility for their separation.

- In other airspace, ATC provides oversight with traffic advisories and safety alerts, but the pilot is responsible for separation.

- AAM aircraft operators are not guaranteed ATC flight following services outside of Class B, C, or D airspace where mandatory air traffic services are not required.

- Air traffic automation is as it currently exists.
    - There are no expected major changes to ATC automation systems within the 2025 to 2028 timeframe to support I28 operations.

- Third-party service providers may support non-safety critical aspects of operations (e.g., operator scheduling of flights), but not substitute for ATC services where required by rule.

- Existing communication methods are used for pilot-controller communications for AAM VFR operations.

Infrastructure

Initial AAM operations in the 2025-2028 timeframe are expected to primarily use existing airports and heliports (with modification where required to meet FAA's interim guidance for vertiport design). Greenfield or infill (repurposed) development for new vertiports is also expected to connect operations to destinations near a city center or other preferred locations. It is unlikely, but possible, that specially built vertiports will be available in this timeframe. Modifications may be required for existing ground and air infrastructure due to the nature of these new aircraft. For example, if heliports are used as vertiports, they require the following infrastructure to successfully operate in the 2025-2028 time:

- *Adequate AAM aircraft parking zones for loading/unloading.* An efficient vertiport has parking zones that are separate from the "pad" that is used for takeoff and landing. Separate parking zones allow for safe entrance and egress of passengers. They also allow for parking of vehicles waiting for demand to materialize.

- *Infrastructure sizing, dimensional geometry and load bearing requirements modified to comply with FAA* Engineering Brief (EB) #105, Vertiport Design (September 21, 2022). The dimensional and sizing requirements for vertiport landing and safety areas may warrant differences from heliports based on the design and performance characteristics of AAM aircraft.

- *Charging stations.* Safe rapid charging stations for electric batteries are present at vertiports as well as adequate cooling stations and hazardous materials (HazMat) lockers/storage for batteries and fire suppression for battery fires. Sufficient amperage is available to reduce recharging time to the minimum.

- *Weather station.* The vertiport has a weather station, possibly an Automated Surface Observing System (ASOS) or Automated Weather Observing System (AWOS), if it is remote from an airport. AAM pilots need to know wind speed and direction, as well as visibility, when planning an arrival or departure. Vertiports co-located with an airport can use the airport's weather system.

- *Fire management services.* The vertiport has access to fire management services with personnel trained in handling electric/hydrogen fueled fires.

New vertiport facilities follow the guidance in FAA EB #105, Vertiport Design. FAA vertiport guidance is updated over time to address the variety of aircraft and operations seeking EIS.

- Airport sponsors or proponents submit a Form 7460-1, *Notice of Proposed Construction or Alteration*, in accordance with 14 CFR § 77.9 for any proposed on-airport (or on-heliport) vertiport support infrastructure (e.g., charging stations, fueling stations, AAM terminal). Airport sponsors with federally obligated facilities, which are airport sponsors who have accepted federal financial assistance, must also conduct proper planning activities including an update to their FAA-approved Airport Layout Plan.

- Sponsors of non-federally obligated facilities or proponents of a new vertiport facility not on or co-located with an existing federally obligated airport or heliport submit a Form 7480-1, *Notice of Landing Area Proposal*, at least 90 days in advance of the day that construction work is to begin on the landing area. This notification to the FAA is required in accordance with 14 CFR part 157, *Notice of Construction, Alteration, Activation, and Deactivation of Airports*.

New vertiport facilities that require approval and/or funding from FAA will undergo FAA environmental review. Facilities that do not require FAA approval or funding may be expected to engage in community engagement consistent with any applicable local rules.

All non-FAA stakeholders will have agreed to established criteria for ground infrastructure, including: vertiport location, charging, cooling, maintenance, security, ground safety, and parking in accordance with federal regulations where applicable. Take-off and landing from the Touchdown and Liftoff Area (TLOF) is recommended for approach and departure operations from a standalone vertiport or vertistop (vertiport with limited services). It is unlikely that AAM operators will use "hover taxi" to taxi or re-position on the airfield due to anticipated battery limitations.

Security

Security is a key component to the safe and secure integration of AAM. However, AAM presents unique challenges for aviation security. Therefore, a Working Group under the broader DOT-lead Interagency Working Group previously discussed was established to focus strictly on security issues to inform the whole of government strategy for addressing the integration and evolution of AAM as required in the AAM Coordination and Leadership Act.

4.3 I28 Scenario

The following provides a glimpse of what I28 might look like once an AAM aircraft has successfully completed the certification processes (including wake turbulence classification)[2] and is ready to fly. This scenario sequence reflects the use of designated operating areas, to include landing and departure areas, other existing infrastructure, services, and existing policies and procedures to the degree possible. LOA negotiations between air traffic, OEMs and operators, airport operators, port authorities, emergency management services, and federal, tribal, state, and local law enforcement organizations establish the processes and procedures for safe and efficient operations.

This simplified thread steps through an I28 AAM operation departing a vertiport in uncontrolled airspace and landing at a tower-controlled airport in controlled airspace:

1. The pilot follows established procedures for checking weather and NOTAMs for departure, en route, and destination, and files a flight plan if required. While passengers prepare to board the AAM aircraft, the pilot conducts aircraft walkarounds, preparations, safety protocols, and departure checklists.

2. Departing in uncontrolled airspace, the pilot is responsible for adhering to appropriate rules governing flight in uncontrolled airspace. The pilot announces their departure intentions over a common radio frequency and maneuvers the aircraft to the takeoff location. After visually ensuring their departure area and path is clear, the pilot departs.

3. The pilot is aware of the requirements for flight in controlled airspace. The aircraft enters controlled airspace by means of two-way radio communication and the appropriate clearance from ATC. Published procedures or agreements (national, local, or signatory) reduce the need for ATC communications.

4. ATC issues instructions or clearances to provide separation and/or sequence the aircraft with other traffic. The pilot on board complies with instructions given by ATC or follows previously coordinated and approved instructions from the approving ATC facility (via published procedures or agreements).

5. ATC transfers control and communication from controller to controller as the aircraft transits different ATC sectors. After the pilot obtains information on destination runway(s) in use, weather, and other pertinent airport information, they start their approach to the landing site or follow a previously approved approach path. The ATC tower issues a clearance to land. The pilot may ask and be permitted to land at airport areas other than runways and taxiways.

[2] *Without wake turbulence classification, ATC is required, per FAA JO 7110.65, to provide the existing maximum wake turbulence separation in Class B airspace (10 nautical miles in front and behind the aircraft), including VFR aircraft.*

6. The pilot on board completes landing checklists, their approach, and safe landing at a new, existing, or predetermined approved landing site. The aircraft is maneuvered to the approved parking area for deplaning.

7. Passengers and crew follow established procedures for deplaning the aircraft. Following prescribed security procedures, the passengers exit the area or are directed to any further security screening required to enter the secure terminal area for connecting flights.

This is a high-level view of I28 operations and the near-term integration phase. The assumptions, expectations, and nature of operations will evolve over time to reflect the technology and infrastructure advancements that will provide increased scalability and types of operations.

5 Innovate28 Workstreams

The FAA is taking a holistic approach to the efforts required for AAM implementation. The I28 leadership team in the NextGen organization (ANG) established iTeams comprised of representatives across FAA lines of business (LOBs) to bring together expertise in different areas associated with AAM implementation and foster collaboration in the planning and execution of required activities. The iTeams represent the major workstreams associated with AAM implementation, including Certification, Airspace and Air Traffic Management, Infrastructure, Environment, Hazardous Materials Safety, and Community Engagement.

This section addresses each workstream and describes the activities completed or underway, as well as gaps to be addressed, to support near-term I28 implementation goals. Integrating this information supports the development of a coordinated roadmap to I28 AAM operations. While the initial focus is on enabling near-term AAM operations, the work efforts and milestones within these workstreams will continue beyond I28 to support the continuous evolution of AAM.

5.1 Certification

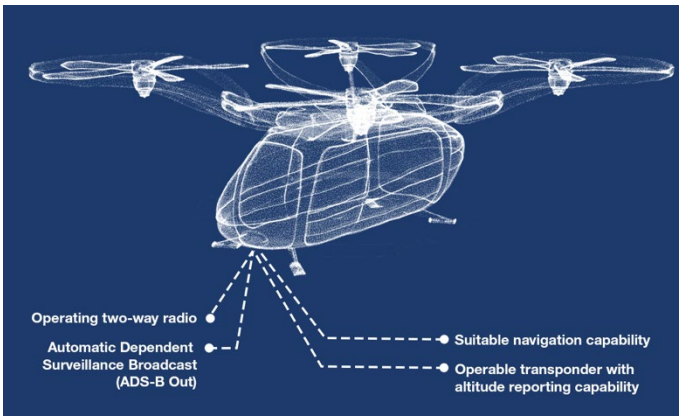

UNITED STATES OF AMERICA
DEPARTMENT OF TRANSPORTATION-FEDERAL AVIATION ADMINISTRATION
STANDARD AIRWORTHINESS CERTIFICATE

The FAA has a proven track record of safely certificating and integrating new and novel design features, aircraft, and safety-enhancing technologies into the NAS. New AAM aircraft are expected to offer capabilities ranging from single-pilot, recreational eVTOL aircraft, to piloted, powered lift, multi passenger short range aircraft. The type certification of AAM aircraft is possible because the FAA can leverage the current regulatory framework, which allows development of project-specific requirements tailored to fit the unique aspects of novel designs. The flexibility to tailor requirements can come in the form of special conditions or unique airworthiness criteria under a special class, depending on the AAM design (airplane, rotorcraft, or powered lift).

5.2 Operational Suitability

As AAM aircraft near issuance of their Type Certificate, the OEM will engage with multiple boards within the FAA's Flight Standards Service (AFX) to conduct operational suitability reviews. It is during this process that the Flight Standardization Board will determine the aircraft type rating, the Maintenance Review Board will determine the scheduled maintenance taskings for development of an operator maintenance program, and the Flight Operations Evaluation Board will determine the requirements of the aircraft's master minimum equipment listing. The applicant may also apply for any needed regulatory exemptions during this process.

5.2.1 Operations Certification



To satisfy regulatory responsibilities and promote convergence, AAM industry engagement concerning operations certification will resemble a mix of traditional aviation with one-on-one engagement combined with utilization of existing and/or new forums that invite FAA-industry (e.g., standards development organizations) collaboration. In other words, the FAA will use normal processes with a mix of one-on-one outreach with individual applicants, and larger groups via forums to achieve a successful collaboration. This is a key procedural step in setting common expectations across the industry.

The FAA is engaged in rulemaking to enable AAM operations. The efforts are currently oriented around piloted operations, and in the interim the agency expects to use waivers, deviations, and exemptions as appropriate for initial operations. For AAM operations to be successful in 2028, it is important to connect, as seamlessly as possible, the interim methods with proposed rulemaking (and an overall framework, including external and internal guidance) as operational experience accrues.

Rulemaking Activities

Integration of Powered Lift: Pilot Certification and Operations: Publication of a Notice of Proposed Rulemaking (NPRM) is expected in June 2023. This action proposes an SFAR for alternate eligibility requirements to safely certificate initial groups of powered lift pilots, as well as determine which operating rules to apply to powered lift aircraft on a temporary basis to enable the FAA to gather additional information and determine the most appropriate permanent rulemaking path for these aircraft.

Recognition of Pilot in Command Experience in the Military and Air Carrier Operations: The final rule was published on September 21, 2022. This action extended the 500-hour credit military pilots of fixed-wing airplanes can use towards the 1,000 hours of air carrier experience to pilots of powered lift aircraft operations. This allows credit for select military time in a powered lift aircraft flown in horizontal flight towards the 250 hours of airplane time as pilot in command (PIC), or second in command performing the duties of PIC, required for an airline transport pilot certificate.

Update to Air Carrier Definitions: This NPRM was published on December 7, 2022, with comments submitted by February 6, 2023. This action proposes to amend the regulatory definitions of certain air carrier and commercial operations. The proposed rule adds powered lift to these definitions to ensure the appropriate sets of rules apply to air carriers' and certain commercial operators' operations of aircraft that FAA regulations define as powered lift. The FAA also proposes to update certain basic requirements that apply to air carrier oversight, such as the contents of operations specifications and the qualifications applicable to certain management personnel. In addition, this action proposes to apply the rules for commercial air tours to powered lift. This proposed rule is an important step in the FAA's integration of this new entrant aircraft in the NAS.

Airman Certification Standards and Practical Test Standards for Airmen; Incorporation by Reference: This NPRM was published on December 12, 2022, with comments submitted by February 10, 2023. This action proposes to revise certain regulations governing airman certification. Specifically, the FAA Airman Certification Standards and Practical Test Standards are currently utilized as the testing standard for practical tests and proficiency checks for persons seeking or holding an airman certificate or rating. The FAA proposes to incorporate these Airman Certification Standards and Practical Test Standards by reference into the certification requirements for pilots, flight instructors, flight engineers, aircraft dispatchers, and parachute riggers.

The following list includes examples of guidance that may need to be developed or updated in support of AAM integration rulemaking activities to describe standards and means of compliance, as well as promote good safety practices. This list is not all-inclusive.

- Advisory Circulars
- Development of standards and practices for Flight Standardization Boards and Maintenance Review Boards
- Processes and Procedures for issuance of 14 CFR part 135 Air Operator Certificates
- Amendment of internal FAA Orders and related change management
- FAA Order 8900.1 Flight Standards Information Management System
- FAA Order 8260-series
- Development of training for workforce to support AAM oversight and certification
- Development of and guidance related to the issuance of Operations Specifications (OpSpecs), Management Specifications (MSpecs), Training Specifications (TSpecs), and Letters of Authorization as appropriate, for AAM Operations
- Guidance and procedures for the issuance of licensing and certification of industry personnel
- Aeronautical Information Manual (AIM) and Aeronautical Information Publication (AIP)
- Pilots Handbook of Aeronautical Knowledge
- Flight Standards infrastructure guidance

Flight Standards is working to further adapt its organizational structure for both conventional and emerging operations. Aircraft capabilities and procedures (defined by manufacturers) are inextricably linked with operational approvals and personnel training, along with procedures for flight operations and continued airworthiness. As such, Flight Standards will continue to work closely with the FAA's Aircraft Certification Service (AIR) as part of an integrated oversight strategy by dovetailing its efforts with the certification of AAM aircraft and the issuance of Type Certificates (and continuous operational safety after entry into service).

Flight Standards is evolving its tools used for coordination of manufacturer/operator applications to increase efficiencies and enhance communications. For simple certifications, some steps can be condensed or eliminated. Some applicants may lack a basic understanding of what is required for certification. Other applicants may propose a complex operation but are well prepared and knowledgeable. Because of the variety in proposed operations and differences in applicant knowledge, processes will be thorough and flexible enough to apply to all possibilities. Industry applicants have the responsibility for compliance. Flight Standards will ensure applicants are aware of applicable regulations, standards, and requirements.

Flight Standards is making improvements to the prioritization and processing of certification of new operators and repair stations. This includes exploring various ways to reduce wait times, while ensuring resources available to support valid business ventures. Similarly, as with conventional aviation and drone operations, surveillance and oversight will be scaled taking a risk-based approach, ensuring application of the right level of FAA (and industry) resources. For cases where direct oversight is not applied as frequently, the FAA will work with industry on broad safety promotion and compliance activities.

5.2.2 Aircraft Certification

Aircraft certification is a process through which the FAA approves the design, production, and airworthiness of aircraft in the U.S. The certification process ensures that an aircraft meets minimum safety and environmental standards set by the FAA before it can be operated commercially or privately in the U.S. airspace.

The certification process involves several stages, including design approval, production approval, and airworthiness approval. Design approval involves reviewing and approving an aircraft's proposed design, including its systems, structures, and performance capabilities. Production approval ensures that an aircraft is built according to the approved design and meets the FAA's quality standards. Finally, airworthiness certification ensures that the aircraft is in a condition for safe operation and conforms to its approved design.

Currently, AIR is engaged with over two dozen manufacturers targeting the development of novel aircraft and propulsion technologies that underlie the design and operation of AAM aircraft. While some of these companies are relatively early in their technology development, vehicle design, and operations concepts, and in their readiness to engage in a new type certification program, nearly half of the companies have reached a level of

maturity and development to have manufactured flying testbed prototypes. Their progress reflects positively on readiness to advance in the type certification process.

AIR is also currently working to define clear certification requirements and pathways to showing compliance for several novel aircraft technologies that are anticipated to be key to the future of AAM design and operations. These technologies include electric propulsion, large lithium-ion battery arrays, hydrogen fuel cell systems for electrical energy supply, distributed propulsion systems with highly integrated flight and propulsion controls, increased automation, and VTOL capabilities for winged aircraft.

The FAA determined that its existing aircraft certification processes are sufficient to type certificate powered lift as a special class under 14 CFR § 21.17(b). The special class process allows the FAA to address the novel features of unique and nonconventional aircraft without the need for additional processes such as special conditions or exemptions that would be required if the FAA used existing airworthiness standards. Under the special class process, the FAA designates or creates applicable airworthiness requirements as the certification basis for each aircraft design, including its engines and propellers. This designation and creation of applicable airworthiness requirements includes appropriate requirements from the existing airworthiness standards applicable to normal category and transport category airplanes, normal category and transport category rotorcraft, aircraft engines and propellers (parts 23, 25, 27, 29, 33, and 35), and it may also include unique airworthiness criteria developed specifically for the individual product.

In order to move forward to a more streamlined certification process, the FAA has proposed an update and expansion of the requirements for Safety Management Systems (SMS) and requires 14 CFR parts 5, *Safety Management Systems*, 21, *Certification Procedures for Products and Articles*, 119, *Certification: Air Carriers and Commercial Operators*, 91, and 135 certificate holders to develop and implement an SMS. The FAA also proposed this rule in part to address a Congressional mandate as well as recommendations from the National Transportation Safety Board (NTSB) and two Aviation Rulemaking Committees (ARCs). The Notice of Proposed Rulemaking on Safety Management Systems was published in the Federal Register on January 11, 2023, and the comment period closed on April 11, 2023.

Acceptable Means of Compliance

A key tenet of the FAA's approach to AAM certification is that an applicant's means of demonstrating compliance with the airworthiness requirements for its proposed design (i.e., the applicant's Means of Compliance (MOC)) must be accepted by the FAA. Although the FAA is leveraging the performance-based requirements from 14 CFR part 23 as modified by amendment 23-64, the consensus standards that the FAA has accepted as MOCs for normal category airplanes may not be appropriate for a particular proposed AAM due to its configuration, complexity, or novel technology. Work is still in progress to provide applicants with standardized MOCs that consider configuration differences, complexity, and novel design.

Noise Considerations

Aviation noise remains one of the primary environmental challenges to the continued growth of aviation. Pursuant to 49 U.S. Code (U.S.C.) 44715, the FAA has the responsibility to "protect the public health and welfare from aircraft noise." This responsibility includes broad authority to adopt regulations and noise standards as necessary. The FAA regulates the maximum noise level that an individual civil aircraft can emit through requiring aircraft to comply with certain noise limits. These limits and associated testing standards are found in *14 CFR part 36, Noise Standards: Aircraft Type and Airworthiness Certification.* Any applicant seeking a type certificate for their aircraft in the U.S. must comply with noise standard requirements as a part of the type certification process.[3] In addition, the FAA must complete a Noise Control Act finding, which ensures that the latest safe and airworthy noise reduction technology is incorporated into aircraft design and enables the reductions in noise experienced by communities.

When establishing the noise certification basis for AAM, the FAA will examine each application and determine whether existing part 36 requirements are appropriate as a noise certification basis, as is done for all applicants whose aircraft are subject to noise certification. If the current standards cannot be appropriately applied, the FAA may promulgate a rule of particular applicability for that applicant's aircraft model to establish a noise certification basis. Such a rule will require environmental review pursuant to the National Environmental Policy Act (NEPA). To date, for the one aircraft presented for noise certification, the FAA has determined that the existing testing procedures and requirements in part 36 are applicable. The FAA is currently evaluating other applications and will determine the noise certification basis for them.

5.3 Airspace and Air Traffic Management

AAM infrastructure, automation, and traffic management approaches will evolve over time as the AAM operational tempo increases in airspace across the NAS. AAM aircraft will be integrated at greater scale with commercial and general aviation (GA) traffic, as well as other low-altitude airspace users, such as recreational and commercial small unmanned aircraft systems or drones. In the near-term for I28, however, these interactions are minimized and thus can be managed with existing ATC tools, procedures, and protocols. AAM aircraft are expected to be operating with a pilot on board and under VFR in VMC conditions; it is likely these aircraft will be treated as any other fixed wing/rotorcraft operating under VFR conditions, to the extent they are able to comply with existing rules, regulations, and procedures.

[3] *If the AAM aircraft is non-electric and has a thrust of >6000lbs, engine emissions regulations could also possibly be applicable.*



The FAA's Air Traffic Organization (ATO) leads the planning, development, and implementation of airspace and ATM solutions, including development of airspace and route structures, policies, procedures, and ATC training. For I28, the ATO developed a general approach for airspace route design and usage, and traffic management that supports AAM VFR operations in the near-term (see Section 4), including the use of existing VFR route constructs.

I28 ATM processes will support a future national strategy, and supplemental directives will ensure consistency in how AAM route networks are designed. Existing mechanisms used by air traffic beyond traditional airspace classifications include the establishment of a special air traffic rule which applies within a Special Flight Rules Area (SFRA). Evaluation of these and alternative methods early in the planning process will allow the required collaboration to ensure timely resolution and publication of AAM route and network design.

Depending on the volume and specific operational needs of I28 operations, local air traffic facilities may need to update their procedures, utilize existing non-rulemaking airspace strategies, and complete an analysis to determine the need for airspace changes. The air traffic planning and analysis policy uses an interdisciplinary approach to effectively manage NAS changes. This would include the development of necessary training in a training delivery plan.

Sufficient time will be allotted throughout I28 development activities to ensure the necessary rulemaking or non-rulemaking activities, route publications and distribution, and training materials can be developed; and controller training can be completed to support the safe management of NAS operations.

In parallel, the ATO will continue to address AAM through its ATO AAM Near-Term Operational Integration Workgroup (NTIWG), which was established in November 2021 to identify air traffic considerations and impacts for near-term operations. After concluding their review in June 2022, the NTIWG had identified 55 recommendations to help address the integration of AAM operations in the near-term. Many of the recommendations require changes to FAA policy and guidance directives including, but not be limited to:

- JO 7110.65 Air Traffic Control
- JO 7210.3 Facility Operation and Administration
- JO 7400.2 Procedures for Handling Airspace Matters

The ATO also recommends a detailed policy review be conducted to determine if other associated orders and ACs need to be updated or developed. Topics that should be considered include:

- Wake Turbulence Categorization and impacts to operations
- Aircraft Certification and how that translates to ATC Service Provisions and Separation
- Minimum Safe Altitude as it applies to AAM
- Workforce and facility staffing considerations

5.4 Infrastructure

AAM operations require specialized infrastructure to support the safe and efficient operation of eVTOL aircraft. This section addresses how existing infrastructure can be leveraged to support near-term operations. It also documents what has been completed to-date to enable the planning, design, and construction of new vertiports or modification of existing facilities. The FAA remains committed to fostering collaboration with industry and local stakeholders to enable vertiport construction. Additional aspects of infrastructure will need to be addressed as I28 efforts progress, including electrification to support charging of AAM aircraft and power for AAM operations. The DOT Interagency Working Group will address these and other topics not directly in the FAA's purview.

5.4.1 Existing Infrastructure

To enable near-term operations, operators and manufacturers desire to use existing infrastructure, including commercial service airports, underutilized GA airports, and heliports. It is likely though that existing heliports and airports will require modification or enhancements to accommodate early entry aircraft and their unique operations.

Facility owners and operators should plan for dedicated takeoff and landing areas and support facilities that address the needs of eVTOL operators, including limited taxi capabilities and charging. Airport and heliport owners should engage existing and future tenants who intend to operate eVTOL aircraft to ensure planning and siting of infrastructure and equipment adequately accommodates their intended operations.

Construction of on-airport vertiport facilities may require FAA notification under 14 CFR part 77, *Safety, Efficient Use, and Preservation of Navigable Airspace* and updates to an airport's FAA approved Airport Layout Plan (for federally obligated airports). Modifications to existing federally obligated infrastructure will also undergo FAA environmental review

and community engagement. Facilities that do not require FAA approval or funding may be responsible for community engagement consistent with local rules.

5.4.2 New Infrastructure

Communities, developers, and operators may also choose to establish new vertiports, not co-located with an existing airport or heliport. State licensing and local zoning ordinances may require updates to accommodate these new types of landing facilities. Where no federal funding is used, FAA oversight and engagement with these new vertiports and their surrounding communities may be limited. Communities are encouraged to plan for vertiports capable of accommodating multiple operators that will benefit passengers. They should also plan for equitable, multimodal placement of vertiports to connect transportation systems without creating new sources of traffic congestion and parking concerns whenever possible. Construction of new infrastructure would trigger FAA notification under 14 CFR part 157.

5.4.3 Vertiport-Related Research

In 2019, the Office of Airports (ARP) and the Airport Technology Research and Development Branch (ATR) began a multi-year research project to support the development of vertiport standards. ATR is investigating and evaluating VTOL and STOL aircraft design and performance to develop design standards and guidance.

For Phase 1, ATR completed a literature review (2021) that identified gaps in available performance data; a result of AAM company concerns about the release of proprietary information. With the help of FAA's Emerging Technology Coordination Branch (formerly known as Center for Emerging Concepts and Innovation) and other AIR offices, using existing mechanisms for communication with applicants and data protection, ATR obtained preliminary AAM aircraft data. The literature review findings, analysis of the aircraft data, and further interchange with manufacturers and operators, supported the development of interim guidance. On September 26, 2022, ARP released EB #105, Vertiport Design. The EB serves as interim guidance to airport sponsors, vertiport operators, and infrastructure developers for the design of vertiports for VTOL operations, until a performance-based AC is released in 2025. The EB is prescriptive and purposely limited to address eVTOL operations using design and performance data available from VTOL aircraft manufacturers currently working toward certification.

Phase 2 of the research was completed in summer 2022 and involved six hypothetical vertiport locations covering a range of diverse scenarios, including on-airport, off-airport (in close proximity to complex airport environment), urban, and rural vertiport environments. Modeling analyzed TLOF occupancy times for arrival and departure operations. The scenarios used site-specific information, allowing development of conceptual layouts for each scenario in an airport layout plan-style drawing.

Phase 3 of the research (started in January 2023) included simulation exercises and operation testing with various AAM companies. The simulation exercises will support

preparations for on-site operational testing which will further evaluate landing precision, approach/departure profiles, rotorwash/downwash impacts, and aircraft taxiing.

The FAA also has an interagency agreement with the Department of Energy's National Renewable Energy Lab (NREL) to determine how aircraft electrification affects a vertiport, heliport, or airport's electrical grid. The research will look at vertiport charging requirements, hazards associated with charging stations, and cybersecurity.

Collaboration among FAA organizations and research branches has been key to ensuring FAA research is relevant and addresses the variety of operations anticipated for I28 and beyond. ARP receives notification of new and innovative aircraft and technology through the AIR Intake Board and other collaborative processes, and then facilitates introductions, as needed, between AIR, the manufacturer, and ATR. The FAA iTeams will continue to coordinate and collaborate on research areas of overlap.

To enable near-term operations, the following areas require further research:

- Vertiport fire extinguishment equipment and electric aircraft firefighting tactics
- VTOL aircraft parking needs
- Vertiport signage, markings, and lighting

5.4.4 Vertiport Standards and Oversight

The FAA is using existing policy, regulations, and infrastructure as a baseline for vertiport guidance and regulations development; however, it will be the responsibility of the operators, manufacturers, state and local governments, and other stakeholders to plan, develop, and enable vertiport infrastructure for I28 operations.

The FAA cancelled its AC on Vertiport Design in 2010 due to a lack of commercially available aircraft. Standards are needed to address the wide variety of aircraft and operations intended under AAM. While the FAA published prescriptive interim guidance for the design of vertiports in EB #105 in September 2022, ARP plans to release a performance-based AC in 2025. Data obtained through operational testing of prototype and production VTOL and STOL aircraft will greatly influence design standards and guidance in the AC. Since AAM is constantly evolving, ARP anticipates updating the vertiport AC more frequently than other airport-related ACs.

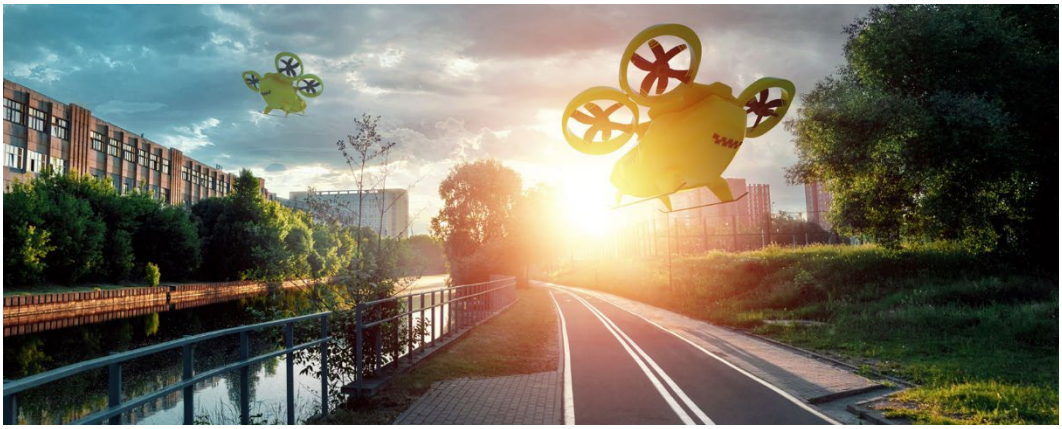
The FAA also established a cross-LOB/staff office 'Vertiport Process Improvement Team' to identify a path forward with developing criteria and standards for processing and analyzing proposed vertiports. This team identified actions necessary to address gaps in existing policies, procedures, and standards, including but not limited to the following:

- Initiate a rulemaking project for 14 CFR parts 77, *Safe, Efficient Use, and Preservation of the Navigable Airspace*, and 157 to clarify applicability to vertiports and supporting infrastructure and define vertiport imaginary surfaces
- Review and update JO 7400.2 Airport Airspace Chapter to address vertiport infrastructure and imaginary surfaces
- Review and update FAA Forms 7460-1 and 7480-1 to identify and address vertiport/supporting infrastructure information and data needed for FAA processing/review
- Define FAA's role in vertiport inspections

Existing statutory authority may limit the agency's ability to regulate (i.e., 14 CFR part 139, *Certification of Airports*) and fund vertiports, particularly for private-use facilities. Without certification or federal funding, facilities may not comply with FAA design standards (a current condition that exists in many heliports) or have similar safety equipment and firefighting equipment onsite like today's commercial service airports.

5.5 Environment

The FAA is responsible for evaluating the significance of environmental impacts for aviation operations in the U.S. and disclosing those impacts to the public. As such, to enable near-term AAM operations, the FAA will consider the impact of AAM aircraft on a variety of aspects of the human environment, including (but not limited to) noise, air quality, visual disturbances, and disruption to wildlife. The FAA has policies and practices in place to conduct environmental review for legacy aviation. However, the FAA is still evaluating how best to streamline the environmental review process for new entrants, such as AAM.



The majority of questions related to compliance with environmental requirements in support of I28 remain open due to the need for additional information on what FAA approvals will be required for different aspects of the operation and any infrastructure, and what FAA offices will be responsible for such approvals. In addition, further information from manufacturers and operational data for aircraft is needed for the analysis of noise and

emissions impacts. In particular, in order to determine whether compliance with NEPA is required, the FAA will need to identify whether there is/are a major federal action(s) triggering NEPA. Certification of aircraft, such as AAM, is a major federal action that will trigger compliance with NEPA, however there may be other FAA actions (e.g., approving or establishing where the AAM aircraft fly) that could trigger NEPA. For example, developing routes for AAM aircraft or introducing AAM into the NAS that will impact other flight operations may trigger NEPA. If NEPA applies, the LOB responsible for the approval will need to determine and conduct the appropriate level of environmental review (including potentially public involvement), as well as consider the need for supplementary community engagement.[4]

The FAA's Office of Environment and Energy (AEE) and the Office of the Chief Counsel (AGC) will provide support and advice to FAA LOBs in identifying applicable actions and determining the appropriate level of environmental review and associated public involvement and community engagement. If environmental reviews are required, the applicable LOB(s) will be responsible for planning, coordinating, and (where applicable) funding the environmental review and provide any associated public involvement and community engagement needed.

5.6 Hazardous Materials Safety

As AAM operations are initially expected to be conducted under 14 CFR part 135, AAM operators will be required to have hazardous materials training programs approved by the FAA; hazardous materials manuals accepted by the FAA; and Operations Specifications permitting or prohibiting accepting, handling, and transporting HazMat. These requirements apply whether or not a part 135 certificate holder chooses to transport hazardous materials. Part 135 HazMat training and manual requirements are function-based and scale to the scope and complexity of a certificate holder's operation.

DOT Hazardous Materials Regulations (HMR; 49 CFR parts 171-185) apply to any operator transporting hazardous materials in commerce. The HMR are promulgated by the Pipeline and Hazardous Materials Safety Administration (PHMSA). Regulations applicable to aviation are promulgated in coordination with the FAA.

As part of an operator's SMS, safety risk assessments accounting for hazardous materials being transported, relative to a specific certificate holder's system, can help to inform supplemental risk management strategies in AAM operations.

[4] The term "public involvement" exclusively refers to activities required under NEPA and other environmental laws and requirements (e.g., scoping meetings, circulation of environmental documents for public review and comment). "Community engagement" refers to agency-specific guidance that FAA employees are encouraged to use.

5.7 Community Engagement

Changes in airport operations, airspace procedures, aviation infrastructure, and technology can have effects on communities. When developing a new project or procedure that may impact the public, the FAA proactively engages with airports, communities, and elected officials to better understand community concerns about aviation noise and in some cases adjust or mitigate these concerns. With AAM, the FAA will proactively engage with airports and elected officials to ensure they understand AAM and expected operations. Currently the scope of what may need to change to accommodate the safe integration and operation of AAM operators into the airspace is evolving. The FAA's level of engagement will follow the level of change; however, given the expected scope of AAM changes, the FAA does not expect the same type of engagement that the agency conducts for major airspace changes.

Engagement at the regional level is the most effective path as AAM stakeholders and the FAA consider key site locations for I28. The FAA's Community Involvement Manual provides flexible guidance and best practices applicable to all FAA actions and will be leveraged for AAM operations and I28. Additional guidance also exists specifically related to airspace procedures. While the FAA does not expect to develop new or unique agency policy, it will be important to ensure all aspects of the I28 project utilize these best practices.

Elements of community engagement are already part of normal business practices for some FAA LOBs or Staff Offices. For example, compliance with NEPA and other environmental requirements often includes required public involvement elements, such as the distribution of an environmental document for public review and comment, that might be one element of a robust community engagement strategy. It is important to note that community engagement supplements but cannot substitute for these required public involvement activities. While public involvement is led by the FAA under some environmental laws or other requirements, community engagement may also be led by the proponent of the project (which may be FAA in the case of many airspace changes but can also be airport sponsors or operators). When the project proponent takes the lead on community engagement, the FAA plays an oversight role, providing advice and guidance on good community engagement practices.

For I28, community engagement needs to focus on more than just airspace and it will involve DOT/FAA and other agency offices. It is important that the public understand how these new aircraft operations will impact their communities. Many other stakeholders, such as AAM operators, vertiport sponsors, and airport operators, will be part of bringing AAM to an operational reality and will have a role in community engagement.

6 Innovate28 Integrated Schedule

The Integrated Master Schedule (IMS) contains a comprehensive list of activities that must be achieved by FAA LOBs and staff offices, industry, and local governments and stakeholders to enable AAM operations at a key site. The IMS is generic for a key site and will be tailored for each individual implementation, including the I28 building blocks, as more information is available. Not all activities included in the comprehensive generic IMS will be required for every implementation, and individual implementations will require additional site-specific activities. As a result, the IMS will be iterative as the team learns from each implementation. The IMS utilizes dependencies between activities which are included in Table 1. The IMS requires further refinement both within the agency and through collaboration with external stakeholders, including industry.

The following lists some considerations for the IMS as displayed in Figure 1:

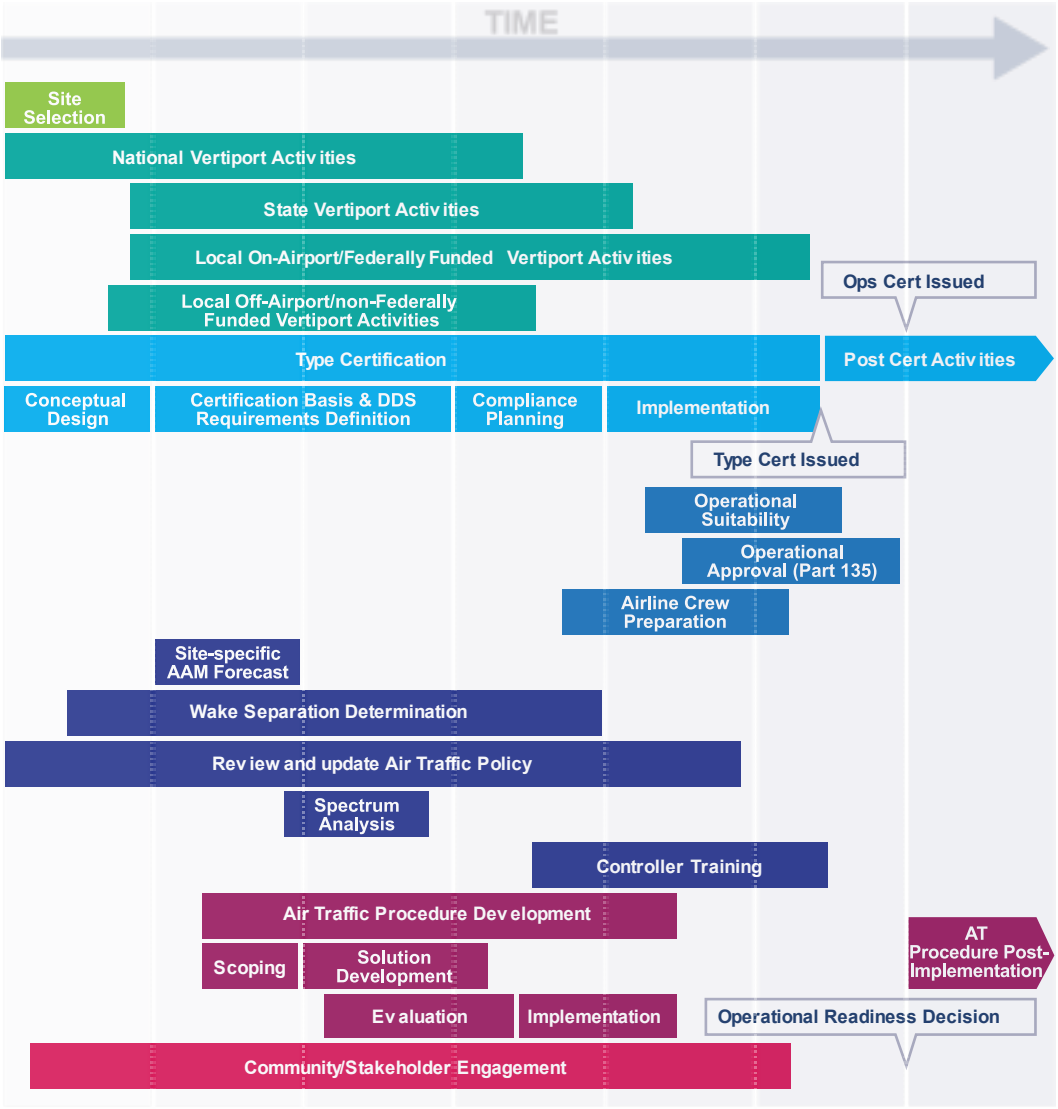
- The Type Certification and Operational Certification paths shown in the IMS are examples for a typical OEM/operator. The certification timelines can vary significantly depending on the maturity and responsiveness of the OEM/operator. Some OEMs have already completed part(s) of the certification processes shown here.

- The Environmental Review timeline is based off a typical Environmental Assessment. This timeline can range significantly based on site-specific factors that can either reduce the Environmental Review to a Categorical Exclusion when the proposed federal action does not individually or cumulatively have a significant effect on the human environment and the proposed action falls within the scope of the approved agency categorical exclusions; or increase it to an Environmental Impact Statement which is required under NEPA when a proposed federal action significantly affects the human environment.

- The timelines of some activities could potentially be significantly reduced or eliminated if it is determined that existing infrastructure can be leveraged with little to no modification.

The final state of the IMS will list a duration and point of contact for each activity so its status can be tracked at routine check-in meetings.

Figure 1. Integrated Master Schedule Version 1.0



Note : The IMS is a depiction of the activities that may be required to allow an operator to enter into service at a location. Depending on the scope and concept of use for their planned operation, not all activities may be required for every implementation; the duration of a step may vary by project as well. Some companies have already completed some of these activities.

Table 1. Detailed List of Activities in the Integrated Master Schedule Version 1.0

High-level Activity	Sub-activities
Select Site	Local discussions and buy-in
National Vertiport Activities	Vertiport Operational Testing data collection and analysis
Vertiport AC	Vertiport AC
	Rulemaking project for Part 77 and 157
State Vertiport Activities	Update zoning ordinances
	Update licensing requirements to address vertiports
	State environmental policy review
Local On-Airport/Federally Funded Vertiport Activities	Airport planning activities
	Airport Layout Plan (ALP) development, submission, and approval process
	Section 163 review
	NEPA Environmental Review
	Site Engineering
	7460 process
	Receive state licensing
	Construction
	Publication and charting
Local Off-Airport/non-Federally Funded Vertiport Activities	7480 process
	Receive state licensing
	Design and Construction
Type Certification	
Conceptual Design	Process Orientation
	Pre-Project Guidance
	Familiarization Briefing
Application Requirements Definition	Application for TC and PC
	Establishment of TC Project
	Certification Project Notification
	Form the Certification Team
Certification Basis and DDS Requirements Definition	The Preliminary TCB Meeting
	Issue Paper Identification
	G-1 Certification Basis
	Notice of proposed airworthiness criteria
	G-2 Detailed Design Standards
	G-3 Noise Standards
	Mean/Method of Compliance
Compliance Planning	Review and Acceptance of Certification Plans
Implementation	Conformity Inspections
	Detail-level compliance plan
	Product-level compliance plan
	Safety Review Board
	TIA & Conformity Inspection
	Flight Tests
	Type Inspection Report
	Final Type Certification Board
	Issue Type Certificate
Post Certification Activities	

High-level Activity	Sub-activities
Operational Certification	
Operational Suitability	Flight Standardization Board (FSB) and Report (FSBR)
	Maintenance Review Board (MRB) and Report (MRBR)
	Conduct Flight Operations Evaluation Board (FOEB)
	Issue Master Minimum Equipment Listing (MMEL)
	Review and Concur with all Instructions for Continued Airworthiness (ICA's)
	Review and Concur with all Flight Manuals and Flight Manual Supplements
Operational Approval (Part 135)	Phase 1: Pre-application
	Phase 2: Formal Application
	Phase 3: Design Assessment
	Phase 4: Performance Assessment
	Phase 5: Administrative Functions
Review and Update Air Traffic Policy	7110.65 Document Change Proposal (DCP)
	Review and Update 7400.2 Airport Airspace Chapter
	Review and update FAA Forms 7460-1 and 7480-1
Spectrum Analysis	
Controller Training	Develop training plan
	Schedule controller training
	Train controllers
Develop and Implement Air Traffic Procedure(s)	
Phase 1: Scoping	
Phase 2: Procedure Solution Development (6 months or more)	Initial design activities, refinement, and validation
	Initial Environmental look
Phase 3: Evaluation (12-18 months)	SMS/SRM Panel and Process
	Environmental Review
Phase 4: Implementation	Finalize SOP and LOA
	Procedure processing and publication, including flight inspection
	Charting
	Aircraft type automation update
Phase 5: Post-Implementation	
Wake Separation Determination	Develop performance data package (e.g. weights, aircraft specifications, flight command/control performance, etc.)
	Wake Separation Assessment
	Update 7360.1
Community/Stakeholder Engagement	Messaging development
	Website development
	Continued Regional Office Community Engagement (local officials, community roundtables)
	Airspace Implementation Community Engagement
Airline Crew Preparation	Identify, vet, and train crew
Site-specific AAM forecast	
Rulemaking	Rulemaking for Pilot Training
	Powered-lift NPRM

7 AAM Evolution Framework

The FAA's approach to supporting the operationalization of AAM encompasses a series of incremental changes and advancements to the regulatory, technological, and operational frameworks that govern the NAS. This approach aims to ensure safety, while also facilitating efficiency and innovation in the AAM industry and will result in a continuum of AAM capabilities that evolves over time as the tempo of operations increases, driving the need for more advanced supporting infrastructure, regulations, and processes. This will allow the collection of early benefits and lessons learned while maintaining progress toward the fully mature state of AAM.

The agency is working on a regulatory framework that will allow AAM aircraft to be fully integrated into the airspace and operate alongside traditional aircraft in the near-term and beyond. The FAA and industry are developing the necessary technologies to support AAM operations, including aircraft and traffic management systems, communication networks, and autonomous capabilities. Finally, the FAA is working to establish operational frameworks that ensure the safe integration of AAM aircraft into the NAS, including training pilots, air traffic controllers, and other stakeholders on new procedures and regulations.

This evolutionary approach to AAM provides advantages. By initially supporting lower complexity operations in the near-term, as with I28, implementation can be achieved by maximizing the use of current capabilities that meet performance requirements and do not require full-scale regulatory and operational infrastructure changes.

With increased tempo, AAM operations will evolve through changes to governing regulations augmented by AAM infrastructure, automation, and cooperative traffic management practices supported by third party services. The evolution to a collaborative, information-rich, data-sharing environment will require new technologies and capabilities. AAM operators and other stakeholders will share information with the FAA having on-demand access to information as needed.

The FAA's ANG organization developed an initial AAM framework that categorizes the evolving phases of AAM and provides context on the AAM roadmap to operationalization. The framework describes the anticipated operational capabilities for both FAA and industry stakeholders as the AAM ecosystem develops and matures over time. The framework also serves to identify key areas that require prioritization and coordination among the various stakeholders across the AAM ecosystem. The framework will inform FAA efforts, but also can be used by industry and other government agencies.

AAM Coordination Areas

The AAM framework consists of five high-level coordination areas, shown in Table 2, within which key AAM capabilities pertaining to both FAA and industry stakeholders are highlighted. AAM capabilities are expected to progress independently toward a mature state. The pace of development may vary within and between coordination areas. Maturity is capability dependent, and not bound by a specific timeline. Regional maturity rates may vary as well, with some communities embracing AAM operations more rapidly than others.

It should be noted that community engagement, although not shown here, will be an integral and required step for each coordination area.

Table 2. AAM Coordination Areas

Area	Considerations for FAA and Industry Stakeholders
Aircraft System	Aircraft, equipment, automation, certification
Infrastructure	Facilities, data systems related standards, federated networks, CNS
Operations	Operational density and modes, procedures, pilot knowledge and training
Airspace	Routes, waivers, cooperative areas, charting and publication
ATC Procedures	Standard operating procedures, LOAs, public-private responsibilities

AAM Maturity Levels

The evolution of capabilities addresses initial, intermediate, and mature states of AAM, and is described across six maturity levels (0-5). Each maturity level is characterized by a set of expected outcomes, as shown in Table 3. One or more triggering events indicate progression from one maturity level to the next.

Table 3. AAM Maturity Levels

Level	Description	Trigger Events (for reaching level)
0	Late-stage certification testing in limited environments, aircraft certification testing and operational evaluations with conforming prototypes and existing rules/procedures, and early industry development and prototyping.	
1	Exploratory operations of minimal density and complexity, type certified aircraft, early FAA procedures development, and initial Provider of Services for UAM (PSU) services.	Completion of relevant NPRMs and rulemaking to allow for vehicle type certification, initial public standards to support data exchanges between industry participants and the FAA.
2	Low-density scheduled commercial operations in urban areas and around airports, as well as an established federated service network* with several PSUs and Supplementary Data Service Providers (SDSPs). Designated cooperative airspace is limited (see UAM ConOps, Version 2.0). **A federated service network is one that is provided and supported by the operators and third-party service providers to exchange the information and agreements needed for FAA-approved cooperative operating practices.*	Increased operational density, new operational modes (e.g., remotely piloted), and the evaluation of cooperative airspace and a federated service network with multiple operating PSUs.
3	Medium-density scheduled and unscheduled commercial operations using an increased number of vertiports and routes in specific geographical areas that make continued use of limited, designated cooperative airspace. Established PSUs and federated service networks support increased levels of automation and instances of remotely piloted aircraft with a safety pilot on board.	Continued evolution of the modes of operations, implementation of designated cooperative airspace in more geographical areas, and the establishment of certification standards for automated and remotely operated large aircraft.
4	Medium-density scheduled and unscheduled commercial operations in an AAM network that make widespread use of cooperative airspace. Fully remotely-piloted operations are supported.	Certification of fully remote piloted aircraft and the availability of enhanced CNS capabilities that can support long distance and fully remote operations, complete implementation of new regulatory frameworks, widespread implementation of cooperative airspace and vertiports, and the ability to support operations in instrument meteorological conditions (IMC).
5	Mature AAM ecosystem, characterized by high density scheduled, unscheduled, and on-demand operations that are geographically dispersed and served by aircraft able to operate autonomously.	Certification of fully autonomous aircraft and the satisfactory performance of highly integrated automation within the federated service network.

FAA and Industry Coordination

The AAM evolution framework embraces independent advancement within coordination areas, but also acknowledges the need for coordination across the areas for the AAM ecosystem to come to fruition. It considers both FAA and industry activities and capabilities to support AAM maturation.

Rulemaking

The FAA uses the same rulemaking process for AAM operations as it does for other aviation-related regulations. To carry out its responsibilities, the FAA must issue regulations that are clear and provide direction to the aviation industry and the public. Through the rulemaking process, the FAA engages with stakeholders, including industry groups, pilots, and the public, to develop regulations that are informed by their inputs. The process provides an opportunity for all interested parties to provide comments and feedback on proposed regulations, which helps to ensure that the final regulations are effective, practical, and above all, ensure safety.

Standards Development

Industry stakeholders, including aircraft manufacturers, operators, and infrastructure providers, play a critical role in developing standards for AAM operations. Industry-driven standards are essential to ensure that AAM vehicles and infrastructure are safe, reliable, and interoperable. Long lead times and the level of stakeholder participation required to develop standards is a high priority area that requires establishing relationships among all the stakeholders, identifying standards development needs, and generating multi-year plans to address those needs and associated actions.

Technology Development and Deployment

Industry's development of technology often moves faster than the regulations addressing the use of the technologies. The FAA needs to establish and maintain close ties with industry to ensure that emerging technologies are designed with safety and NAS integration in mind and that regulations do not unduly constrain technology and market development. This includes the need for industry to consider the complexity of aviation operations and human factors, especially when proposing highly automated solutions. Additionally, the FAA needs to work closely with foreign regulatory counterparts and Air Navigation Service Providers to align and harmonize AAM-related regulations, policies and procedures, as applicable, given this sector's global, entrepreneurial, and innovative ecosystem.

The long lead time for development and deployment of FAA capabilities also makes identifying FAA technology/capability requirements and establishing roadmaps for acquisition and development a high priority activity.

Network Development

The mature state vision for AAM involves industry-built networks for data exchange to support many functions that the FAA has traditionally performed, including aspects of airspace management. These networks and the processes implemented for using them must be compatible with FAA data exchange mechanisms and airspace design and procedures.

Airspace Design and Management

Initial AAM operations that are low density and low complexity will be conducted using existing airspace design and charting processes, and airspace constructs available today (e.g., VFR corridors/flyways, T-routes). As the operations continue to increase in volume and complexity, novel airspace design may be needed to accommodate operations. The concept of designating cooperative areas for AAM operations envisions safe and efficient operations that may not require traditional ATC services in certain situations. They will be available to any aircraft appropriately equipped to meet the performance requirements and are created and implemented when operationally advantageous.

Moving Forward

The FAA will continue to work with AAM stakeholders to refine and further mature this framework and move towards an AAM ecosystem that supports innovation and scalability. The FAA is committed to ensuring the appropriate resources are allocated, workgroups are established to address areas that require research and development, and policy and regulatory decisions keep AAM moving forward into the future.

Acronyms

Acronym	Definition	Acronym	Definition
AAM	Advanced Air Mobility	IMC	Instrument Meteorological Conditions
AC	Advisory Circular	IMS	Integrated Master Schedule
ADS-B	Automatic Dependent Surveillance – Broadcast	I28	Innovate28
AGC	Office of the Chief Counsel	LOA	Letter of Agreement
AEE	Office of Environment and Energy	LOB	Line of Business
AFX	Flight Standards Service	MOC	Means of Compliance
AIM	Aeronautical Information Manual	MOU	Memorandum of Understanding
AIP	Aeronautical Information Publication	NAS	National Airspace System
AIR	Aircraft Certification Service	NASA	National Aeronautics and Space Administration
ANG	Office of NextGen	NEPA	National Environmental Policy Act
ARC	Aviation Rulemaking Committee	NOTAM	Notice to Air Mission
ARP	Office of Airports	NREL	National Renewable Energy Lab
ASOS	Automated Surface Observing System	NTSB	National Transportation Safety Board
ATC	Air Traffic Control	OEM	Original Equipment Manufacturer
ATM	Air Traffic Management	NPRM	Notice of Proposed Rulemaking
ATO	Air Traffic Organization	PHMSA	Pipeline and Hazardous Materials Safety Administration
ATR	Airport Technology Research and Development Branch	PIC	Pilot in Command
AWOS	Automated Weather Observing System	PSU	Provider of Services for Urban Air Mobility
CFR	Code of Federal Regulations	SDSP	Supplementary Data Service Provider
CNS	Communications Navigation Surveillance	SFAR	Special Federal Aviation Regulation
DOT	Department of Transportation	SFRA	Special Flight Rules Area
EB	Engineering Brief	SMS	Safety Management System
EIS	Entry into Service	STOL	Short Takeoff and Landing
EMS	Emergency Management Services	TFR	Temporary Flight Restriction
eVTOL	Electric Vertical Takeoff and Landing	TLOF	Touchdown and Liftoff Area
FAA	Federal Aviation Administration	UAM	Urban Air Mobility
GA	General Aviation	U.S.C.	United States Code
HMR	Hazardous Materials Regulation	VMC	Visual Meteorological Conditions
ICAO	International Civil Aviation Organization	VFR	Visual Flight Rules

From: BEACH Anthony <Anthony.BEACH@odav.oregon.gov>
Sent on: Monday, September 23, 2024 11:08:25 PM
To: Samantha Peterson <SPeterson@CenturyWest.com>; Brandy Steffen <brandy.steffen@jla.us.com>
Subject: FW: Meeting last week
Attachments: FW Scope request - Runway Justification Constrained Operations Report.eml (1.35 MB), Potential for MOS related to runway extensions at UAO.eml (99.57 KB), Mod to Stnd Form (ROFA).doc (60 KB), UAO Mod to Standards.pdf (1.82 MB), UAO 2-13-2023 - LOI Closeout Letter.pdf (249.4 KB)

FYI, please include this response in our record.

Thank you,

Tony Beach
OREGON DEPARTMENT OF AVIATION
STATE AIRPORTS MANAGER
OFFICE 503-378-2523 **CELL** 503-302-5455
M-F 7:30am – 4pm

From: BEACH Anthony
Sent: Monday, September 23, 2024 4:08 PM
To: SUGAHARA Kenji <Kenji.SUGAHARA@odav.oregon.gov>; THOMAS Alex R <Alex.R.THOMAS@odav.oregon.gov>; Wendie Kellington <wk@klgpc.com>; Posegate Stacy C <Stacy.C.Posegate@doj.oregon.gov>; Samantha Peterson <speterson@centurywest.com>
Subject: RE: Meeting last week

Hi Wendie,

Following up on this discussion, please see the attached documents pertaining to Modification of Standards. The Word document is dated 2012 in our system, the PDF Mod form is from 2018. I don't have any email records for these forms specifically, but the 2023 LOI closeout letter confirms the FAA has not granted a MOD for the ROFA at UAO.

Thank you,

Tony Beach
OREGON DEPARTMENT OF AVIATION
STATE AIRPORTS MANAGER
OFFICE 503-378-2523 **CELL** 503-302-5455
M-F 7:30am – 4pm

From: SUGAHARA Kenji <Kenji.SUGAHARA@odav.oregon.gov>
Sent: Monday, September 23, 2024 7:45 AM
To: BEACH Anthony <Anthony.BEACH@odav.oregon.gov>; THOMAS Alex R <Alex.R.THOMAS@odav.oregon.gov>; Wendie Kellington <wk@klgpc.com>; Posegate Stacy C <Stacy.C.Posegate@doj.oregon.gov>; Samantha Peterson <speterson@centurywest.com>
Subject: Meeting last week

Wendie!

Thanks for reaching out to ODAV to talk about the comments that you provided on behalf Ted Millar, TLM and AABC concerning the refined alternatives presented to the PAC on July 30, 2024. I also appreciated the opportunity to speak directly with the communities that are and will be affected by ODAV's planning efforts for UAO. It's always important to listen to stakeholders about their concerns and their wishes. I hope our conversation was helpful in understanding ODAV's role in this planning phase and in particular our hope to select an alternative that FAA will support and ultimately agree to extend federal funds to help implement. Like I mentioned in my response to your request for a meeting, I'll be ensuring that all ODAV's communications with its stakeholders are made part of the record. This this email is intended to provide a high-level summary of our discussion today in which you, Anthony Beach, Alex Thomas , Stacy Posegate of DOJ and I attended by teams.

As I explained in our meeting, Chuck Garrison, Director of the Northwest Mountain Region for FAA, has made clear to ODAV that FAA will not fund future projects if the Aurora Airport master plan does not include an ALP that will bring components of the airport up to FAA's standards of compliance. The primary areas of concern, as we have discussed, are the ROFA which extends over and above the Hubbard Highway, OR 551, and the drainfield within the Runway Safety Area supporting your clients' businesses.

I understand that you are asking ODAV to consider another alternative airport layout plan, which you describe in more detail in your letter. You have explained that this alternative should be preferable because it would not require additional real property or moving OR 551. You have also stated that the current alternatives are unrealistic or unnecessary because they seek to obtain "perfect compliance" with FAA standards. But that, in your opinion, perfect compliance is not required. Rather, FAA has an obligation to consider any modifications requested by the ODAV. You also explained that your clients are extremely concerned with the investment that they have put into this airport and their relationship with ODAV. We take all input and comments seriously.

From: Samantha Peterson <SPeterson@CenturyWest.com>
Sent on: Tuesday, September 3, 2024 6:23:44 PM
To: W. Matt Rogers <WRogers@CenturyWest.com>; BEACH Anthony <Anthony.BEACH@odav.oregon.gov>; David Miller <dmiller@CenturyWest.com>; THOMAS Alex R <Alex.R.THOMAS@odav.oregon.gov>
Subject: FW: Scope request - Runway Justification / Constrained Operations Report
Attachments: interimLandUseRPZGuidance.pdf (969.64 KB)

This message was sent from outside the organization. Treat attachments, links and requests with caution. Be conscious of the information you share if you respond.

From: PECK Heather [mailto:heather.peck@aviation.state.or.us]
Sent: Wednesday, December 18, 2019 09:37
To: Matt Rogers <wrogers@centurywest.com.com>; Mike Dane <MDane@CenturyWest.com>; James Kirby <JKirby@CenturyWest.com>
Subject: Fwd: Scope request - Runway Justification / Constrained Operations Report

---

From: "Tykoski, Robert (FAA)" <Robert.Tykoski@faa.gov>
Subject: RE: Scope request - Runway Justification / Constrained Operations Report
Date: 17 December 2019 15:45
To: "PECK Heather" <heather.peck@aviation.state.or.us>
Cc: "STANSBURY Betty" <Betty.STANSBURY@aviation.state.or.us>, "CLARK Cathy RB" <Cathy.RB.CLARK@aviation.state.or.us>, "MAASS Matthew D" <Matthew.D.MAASS@aviation.state.or.us>, "Dalke, Joseph (FAA)" <joseph.dalke@faa.gov>, "Callahan, Sean (FAA)" <Sean.Callahan@faa.gov>

Heather,

On page 3-6 it calls out two items that need additional coordination with FAA:

RPZ - Extension of the runway will place non-compatible land uses in the RPZ. – To run this to ground and make sure that this is something the FAA can support, a RPZ memo needs to go to FAA HQ. Please see the attached document for additional direction.

ROFA - Wilsonville Hubbard Highway runs parallel to the RWY and the north-bound lane falls within the runway OFA. – A similar analysis to the RPZ needs to be done that includes looking at alternatives to resolve the non-standard conditions, costs, etc. Could the road move west? Could the runway/taxiway move east? The FAA does not provide any permanent modifications to standards; therefore, it is not appropriate to assume further development of a non-standard condition without first exploring options to eliminate the condition.

The document also calls out runway connectors which depending on if a solution to the ROFA can be identified may become part of a RWY extension scope and may also need to be considered (If we are touching the runway/taxiway then we would need to identify solutions for the direct access)

As stated during the call, these questions need to be answered prior to an EA because if physical solutions are identified to resolve any or all of the above mentioned issues, they would have a connected action to the RWY extension and need to be considered in the EA. Proceeding without a full understanding of the scope of a project risks segmentation under NEPA.

Please let me know if you have additional questions.

Regards,

Robert Tykoski

(206)231-4139

From: PECK Heather <heather.peck@aviation.state.or.us>
Sent: Tuesday, December 17, 2019 3:05 PM
To: Tykoski, Robert (FAA) <Robert.Tykoski@faa.gov>

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION
NORTHWEST MOUNTAIN REGION
AIRPORT IMPROVEMENT PROGRAM

MODIFICATION OF AIRPORT DESIGN STANDARDS

BACKGROUND

1. AIRPORT:	2. LOCATION(CITY,STATE):	3. LOC ID:
Aurora State Airport	**Aurora, Oregon**	**KUAO**

4. EFFECTED RUNWAY/TAXIWAY:	5. APPROACH (EACH RUNWAY):	6. AIRPORT REF. CODE (ARC):
Runway 17/35	☐ PIR ☒ NPI ☐ VISUAL	**C-II**

7. DESIGN AIRCRAFT (EACH RUNWAY/TAXIWAY):

MODIFICATION OF STANDARDS

8. TITLE OF STANDARD BEING MODIFIED (CITE REFERENCE DOCUMENT):
Advisory Circular (AC) 150/5300-13, para 307

9. STANDARD/REQUIREMENT:
The runway object free area (OFA) requires that no above ground objects protrude above the runway safety area edge elevation. For Aurora State (ARC C-II) the standard OFA width is 800 feet.

10. PROPOSED:
Highway 551 runs north/south parallel to Runway 17/35. Current operations at the Airport justify increasing the Airport's ARC to C-II. The distance from the Runway 17/35 centerline to the Highway 551 centerline is approximately 400 feet. Considering the highway's width, the Airport is approximately 20 feet short of meeting the OFA design standard.

As the airport geometry is not changing from the current condition, the Oregon Department of Aviation requests a modification of the OFA design standard as defined in AC 150/5300-13, para 307.

11. EXPLAIN WHY STANDARD CANNOT BE MET (FAA ORDER 5300.1E):
Highway 551 and the vehicles travelling along the highway penetrate the Airport's runway OFA by approximately 20 feet.

12. DISCUSS VIABLE ALTERNATIVES (FAA ORDER 5300.1E):
Runway 17/35 could be located 20 feet eastward to meet the OFA design standard. Alternatively, Highway 551 could be located 20 feet westward to achieve the 400-foot separation standard. However, neither alternative is financially feasible due to the existance of airport buildings to the east and residential properties to the west.

13. STATE WHY MODIFICATION WOULD PROVIDE ACCEPTABLE LEVEL OF SAFETY, ECONOMY, DURABILITY, AND WORKMANSHIP (FAA ORDER 5300.1E):

No changes to the existing airport geometry are proposed. Additionally, the Department of Aviation has recently removed obstructions (shrubs) along the edge of Highway 551 to increase safety margins. The safety of people on the ground or in aircraft will not be reduced as a result of the proposed design standard modification.

ATTACH ADDITIONAL SHEETS AS NECESSARY – INCLUDE SKETCH/PLAN

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION
NORTHWEST MOUNTAIN REGION
AIRPORT IMPROVEMENT PROGRAM

MODIFICATION OF AIRPORT DESIGN STANDARDS

MODIFICATION: **AC 150/5300-13, para 307**	LOCATION: **Aurora State Airport**	PAGE 2 OF 2
14. SIGNATURE OF ORIGINATOR:	15. ORIGINATOR'S ORGANIZATION: **Oregon Department of Aviation**	16. TELEPHONE: **503-378-4880**
17. DATE OF LATEST FAA SIGNED ALP:		
18. ADO RECOMMENDATION:	19. SIGNATURE:	20. DATE:
21. FAA DIVISIONAL REVIEW (AT, AF, FS):		

ROUTING SYMBOL	SIGNATURE	DATE	CONCUR	NON-CONCUR

COMMENTS:

22. AIRPORTS' DIVISION FINAL ACTION:

☐ UNCONDITIONAL APPROVAL	☐ CONDITIONAL APPROVAL	☐ DISAPPROVAL

DATE:	SIGNATURE:	TITLE:

CONDITIONS OF APPROVAL:

USER'S GUIDE

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION
NORTHWEST MOUNTAIN REGION
AIRPORT IMPROVEMENT PROGRAM

MODIFICATION OF AIRPORT DESIGN STANDARDS FORM

ITEMS 1-17 ARE TO BE COMPLETED BY THE AIRPORT SPONSOR(ORIGINATOR). ALL OTHER ITEMS WILL BE COMPLETED BY THE FAA.

THE COMPLETED FORM WILL BE TRANSMITTED BY THE ORIGINATOR TO THE APPLICABLE ADO/AFO. THE ADO/AFO WILL TRANSMIT THE FINAL FAA DETERMINATION TO THE ORIGINATOR.

MODIFICATION TO AIRPORT DESIGN STANDARDS REQUESTS SHOULD INCLUDE SKETCHES OR DRAWINGS WHICH CLEARLY ILLUSTRATE THE NONSTANDARD CONDITION.

ITEMS

1. LEGAL NAME OF AIRPORT.

2. ASSOCIATED CITY.

3. AIRPORT LOCATION IDENTIFIER (SEE APPROACH PLATES/AIRPORT FACILITY DIRECTORY).

4. IDENTIFY THE RUNWAY(S), TAXIWAY(S) OR OTHER FACILITIES EFFECTED BY THE PROPOSED MODIFICATION TO STANDARDS REQUEST.

5. IDENTIFY THE MOST CRITICAL APPROACH FOR EACH RUNWAY IDENTIFIED IN #4.

6. AIRPORT REFERENCE CODE - SEE PARAGRAPH 2, PAGE 1 AC 150/5300-13(CHANGE 4) - I.E. C-II, B-II, A-I (SMALL).

7. NOTE THE DESIGN AIRCRAFT (ARC OR SPECIFIC AIRCRAFT) FOR EACH FACILITY IDENTIFIED IN #4. A DESIGN AIRCRAFT MUST MAKE REGULAR USE OF THE FACILITY. NORMALLY, FAA CONSIDERS REGULAR USE TO BE 500 OR MORE ANNUAL INTINERANT OPERATIONS.

IF THE AIRPORT SERVES A WHOLE FAMILY OF AIRCRAFT IN A PARTICULAR GROUP, THE ARC (I.E. B-II) SHOULD BE SPECIFIED. IF,HOWEVER, THE AIRPORT IS USED BY ONLY 1 OR 2 OF A FAMILY OF AIRCRAFT (IX- BEECH KING AIR C90), THE MOST DEMANDING (APPROACH SPEED, WINGSPAN) AIRCRAFT SHOULD BE SPECIFIED.

8. IDENTIFY THE SPECIFIC NAME OF THE STANDARD THAT IS PROPOSED TO BE MODIFIED FOR THE SUBJECT LOCAL CONDITION.

9. DESCRIBE (WORDS AND NUMBERS) THE DIMENSIONS AND REQUIREMENTS OF THE STANDARD AS PROVIDED IN AC 150/5300-13.

10. STATE THE PROPOSED MODIFICATION TO THE STANDARD.

11. DISCUSS THE LOCAL CONDITIONS THAT MAKE IT IMPRACTICAL OR IMPOSSIBLE TO MEET THE STANDARD.

12. IDENTIFY ALTERNATIVES TO THE SUBJECT PROPOSED MODIFICATION, AND SHOW WHY THESE ALTERNATIVES ARE NOT VIABLE.

13. DISCUSS HOW THE PROPOSED MODIFICATION WOULD IMPACT AIRPORT SAFETY AND EXPLAIN WHY AN ACCEPTABLE LEVEL OF SAFETY, ECONOMY, DURABILITY, AND WORKMANSHIP WOULD STILL EXIST.

14. TYPED NAME AND SIGINATURE OF AIRPORT AUTHORITY REPRESELNTATIVE.

15. SELF-EXPLANATORY.

16. SELF-EXPLANATORY.

17. SELF-EXPLANATORY.

18. TO BE COMPLETED BY FAA.

From: House Timothy <Timothy.A.House@faa.gov>
Sent on: Tuesday, March 26, 2024 10:56:36 PM
To: BEACH Anthony <Anthony.BEACH@odav.oregon.gov>
CC: Samantha Peterson <SPeterson@CenturyWest.com>; THOMAS Alex R <Alex.R.THOMAS@odav.oregon.gov>; David Miller <dmiller@CenturyWest.com>
Subject: Potential for MOS related to runway extensions at UAO

This message was sent from outside the organization. Treat attachments, links and requests with caution. Be conscious of the information you share if you respond.

Facility requirements chapter comments were provided earlier today. A question was asked of me when the Facility Requirements chapter was provided for review and I wanted to make sure it was answered concurrently with my review comments of the chapter.

The question was related to the likelihood of the FAA issuing a MOS for existing non standard conditions or allowing future projects to be constructed with MOS.

The question was asked to both Regional level management and ADO level management. The answer provided was consistent. The Region and ADO would not be in support of issuing MOS related to the extension of the runway. Standards would have to be met for ROFA and RSA requirements.

Please let me know if you need any additional information on this topic. We are aware this will have a significant impact on your next chapter, alternatives.

Tim A. House

Lead Planner, SEA Airports District Office

FAA Northwest Mountain Region

206-231-4248

405-607-9949 (mobile)



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U.S. Department
of Transportation
**Federal Aviation
Administration**

Airports Division,ANM-620
2200 S. 216th Street
Des Moines, WA 98198
Email: Andrew.Edstrom@faa.gov
Phone: 206-231-9038

February 13, 2023

Mr. Tony Beach
Aurora State Airport
Airport Manager
3040 25th Street SE
Salem, OR 97302

RE: Investigation Closeout of Vehicle/Pedestrian Deviation

Dear Mr. Beach:

On December 30, 2022, we advised you that the Federal Aviation Administration was investigating an incident that reportedly involved:

A DARK BLUE CHEVY PICKUP TRUCK ENTERED TAXIWAY A FROM THE NORTHERN MOST EAST RAMP AREA AND PROCEEDED SOUTHBOUND 50FT BEFORE RE-EXITING TO THE EASTERN NON-MOVEMENT AREA. THERE WERE NO COMMUNICATIONS WITH THE VEHICLE. NO AC WERE INVOLVED.

This letter is to inform you that the investigation of this incident has resulted in the following recommendations.

1. Develop and implement training for access and procedures for the following:
   - Non-movement driving access
   - Movement area driving
   - Escort procedures

2. Develop and implement rules and regulations for Aurora State Airport. Consequences of non-compliance should be a component of the rules and include penalties for violations. Advisory Circular (AC) *150/5210-20A Ground Vehicle Operations to include Taxing or Towing an Aircraft on Airports* contains guidance for establishing programs that will improve access to movement areas, safety areas and the airport operations area.

3. Develop a plan to implement and educate tenants about rules and regulations and training requirements to include outreach, education and training opportunities.

4. Ensure enforcement for violations are adhered to when violations do occur.

5. Keep all gates closed to prevent inadvertent entry to the movement area by unauthorized persons and vehicles.

6. Evaluate installation of a vehicle service road (VSR) in the non-movement area.

7. Markings

- Install the markings in accordance with AC *150/5340-1M, Standards for Airport markings.*
- Non-movement area boundary marking - Upgrade the non-movement boundary marking from 6 inch width to 12 inch width (Paragraph 5.4.5.2).
- Upgrade standard taxiway centerline markings to enhanced centerline markings (Paragraph 4.3).
- Install Surface Painted Hold Position Signs (SPHPS) (Paragraph 4.5) and Enhanced Taxiway Centerlines.
- Develop and implement an airfield marking maintenance program including cleaning, replacing, and repairing faded, missing, or a nonfunctional markings; keeping each item unobscured and clearly visible; and ensuring that each item provides an accurate reference to the user.

8. Lighting

- Install standard taxiway edge reflectors to differentiate specific areas of airfield. South ramp area has a sea of pavement with markings not maintained and DOT reflectors installed. This makes it very difficult to differentiate between usable and unusable pavement.
- Long term solution would be to install taxiway edge lighting to all appropriate taxiways on movement side of airfield.

9. Signs

- Add taxiway direction and location signs to the airfield. Only runway exit signs and hold signs exist (with the exception of one destination sign). The airfield is controlled and when Air Traffic is conversing with pilots the pilots don't have an easy way to identify where they are at on the airfield.
- Install VSR stop sign at access points where through the fence operations areas exist that conform with AC *150/534-18G Standards for Airport Sign Systems.* Example of a location would be the movement area at Taxiway A1.
- Review current signs on airfield and ensure they meet current standards and remove incorrect and outdated signs.
- Provide signs at gates to reference gates are to be closed and to reinforce the rules and regulations. Such as an operator be responsible for an unauthorized entry if say there was someone to follow through the gate.
- Work with local Air Traffic Control to provide outreach and education.

<u>Identified non-standard Airport Design Standards</u>

1. Aurora State Airport Sponsor does not control the property for all runway object free areas (ROFA) for C-II standards. The C-II standard ROFA from runway centerline is 400 feet. This exceeds the current location of the non-movement boundary marking (365.5 feet from runway centerline). Due to this it was found Life Flight and other aircraft were seen parked within the ROFA which is contrary to airport design standards (reference AC *150/5300-13B Airport Design* paragraph 3.12.1)

2. The Airport Layout Plan (ALP) has listed the planned modification to standard for Highway 551 but the Office of Airports does not have an approved final modification to standard approved on file.

3. It was found that the Willamette sign on the north end of the airfield around Taxiway A1 was located in the ROFA.

At non-certificated airports that have received Federal grants, the owner is obligated to comply with Federal Grant Assurance #19, Operations and Maintenance, which includes implementing corrective actions to eliminate V/PD's. FAA Order 5200.10, Procedures for conducting investigations of Vehicle/Pedestrian Deviations, states that if V/PDs continue to occur on the airport, and the airport certificate holder/operator has not taken any actions to alleviate or reduce the runway incursion problem, it will be necessary for the FAA to initiate enforcement proceedings. An airport owner's failure to comply with its grant obligations may result in the FAA withholding discretionary funds during the course of its investigation, or as a result of the FAA's investigation (i.e., a finding that the airport is ineligible to receive Federal grants) until the matter is resolved. The FAA is not considering funding disruptions at this time, with the understanding that the airport is taking action to address V/PD's. By implementing these measures, and taking appropriate action to alleviate future taxiway incursions, will ensure the airport remains in compliance with Federal Grant Assurances.

Sincerely,



Andrew Edstrom
Airport Certification Safety Inspector
FAA Northwest Mountain Region, Airports Division

cc: Jason Ritchie, ANM-620
Rick Schoder, ANM-620
Kate Glassey, SEA ADO
Tim House, SEA ADO

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION
NORTHWEST MOUNTAIN REGION
AIRPORT IMPROVEMENT PROGRAM

MODIFICATION OF AIRPORT DESIGN STANDARDS

BACKGROUND

1. AIRPORT:	2. LOCATION(CITY,STATE):	3. LOC ID:
Aurora State Airport	**Aurora, Oregon**	**KUAO**

4. EFFECTED RUNWAY/TAXIWAY:	5. APPROACH (EACH RUNWAY):	6. AIRPORT REF. CODE (ARC):
Runway 17/35	☐ PIR ☒ NPI ☐ VISUAL	**C-II**

7. DESIGN AIRCRAFT (EACH RUNWAY/TAXIWAY):

MODIFICATION OF STANDARDS

8. TITLE OF STANDARD BEING MODIFIED (CITE REFERENCE DOCUMENT):
Advisory Circular (AC) 150/5300-13, para 307

9. STANDARD/REQUIREMENT:
The runway object free area (OFA) requires that no above ground objects protrude above the runway safety area edge elevation. For Aurora State (ARC C-II) the standard OFA width is 800 feet.

10. PROPOSED:
Highway 551 runs north/south parallel to Runway 17/35. Current operations at the Airport justify increasing the Airport's ARC to C-II. The distance from the Runway 17/35 centerline to the Highway 551 centerline is approximately 400 feet. Considering the highway's width, the Airport is approximately 20 feet short of meeting the OFA design standard.

As the airport geometry is not changing from the current condition, the Oregon Department of Aviation requests a modification of the OFA design standard as defined in AC 150/5300-13, para 307.

11. EXPLAIN WHY STANDARD CANNOT BE MET (FAA ORDER 5300.1E):
Highway 551 and the vehicles travelling along the highway penetrate the Airport's runway OFA by approximately 20 feet.

12. DISCUSS VIABLE ALTERNATIVES (FAA ORDER 5300.1E):
Runway 17/35 could be located 20 feet eastward to meet the OFA design standard. Alternatively, Highway 551 could be located 20 feet westward to achieve the 400-foot separation standard. However, neither alternative is financially feasible due to the existance of airport buildings to the east and residential properties to the west.

13. STATE WHY MODIFICATION WOULD PROVIDE ACCEPTABLE LEVEL OF SAFETY, ECONOMY, DURABILITY, AND WORKMANSHIP (FAA ORDER 5300.1E):

No changes to the existing airport geometry are proposed. Additionally, the Department of Aviation has recently removed obstructions (shrubs) along the edge of Highway 551 to increase safety margins. The safety of people on the ground or in aircraft will not be reduced as a result of the proposed design standard modification.

ATTACH ADDITIONAL SHEETS AS NECESSARY – INCLUDE SKETCH/PLAN

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION
NORTHWEST MOUNTAIN REGION
AIRPORT IMPROVEMENT PROGRAM

MODIFICATION OF AIRPORT DESIGN STANDARDS

MODIFICATION: **AC 150/5300-13, para 307**	LOCATION: **Aurora State Airport**	PAGE 2 OF 2
14. SIGNATURE OF ORIGINATOR:	15. ORIGINATOR'S ORGANIZATION: **Oregon Department of Aviation**	16. TELEPHONE: **503-378-4880**
17. DATE OF LATEST FAA SIGNED ALP:		
18. ADO RECOMMENDATION:	19. SIGNATURE:	20. DATE:
21. FAA DIVISIONAL REVIEW (AT, AF, FS):		

ROUTING SYMBOL	SIGNATURE	DATE	CONCUR	NON-CONCUR

COMMENTS:

22. AIRPORTS' DIVISION FINAL ACTION:

☐ UNCONDITIONAL APPROVAL	☐ CONDITIONAL APPROVAL	☐ DISAPPROVAL

DATE:	SIGNATURE:	TITLE:

CONDITIONS OF APPROVAL:

USER'S GUIDE

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION
NORTHWEST MOUNTAIN REGION
AIRPORT IMPROVEMENT PROGRAM

MODIFICATION OF AIRPORT DESIGN STANDARDS FORM

ITEMS 1-17 ARE TO BE COMPLETED BY THE AIRPORT SPONSOR(ORIGINATOR). ALL OTHER ITEMS WILL BE COMPLETED BY THE FAA.

THE COMPLETED FORM WILL BE TRANSMITTED BY THE ORIGINATOR TO THE APPLICABLE ADO/AFO. THE ADO/AFO WILL TRANSMIT THE FINAL FAA DETERMINATION TO THE ORIGINATOR.

MODIFICATION TO AIRPORT DESIGN STANDARDS REQUESTS SHOULD INCLUDE SKETCHES OR DRAWINGS WHICH CLEARLY ILLUSTRATE THE NONSTANDARD CONDITION.

ITEMS

1. LEGAL NAME OF AIRPORT.

2. ASSOCIATED CITY.

3. AIRPORT LOCATION IDENTIFIER (SEE APPROACH PLATES/AIRPORT FACILITY DIRECTORY).

4. IDENTIFY THE RUNWAY(S), TAXIWAY(S) OR OTHER FACILITIES EFFECTED BY THE PROPOSED MODIFICATION TO STANDARDS REQUEST.

5. IDENTIFY THE MOST CRITICAL APPROACH FOR EACH RUNWAY IDENTIFIED IN #4.

6. AIRPORT REFERENCE CODE - SEE PARAGRAPH 2, PAGE 1 AC 150/5300-13(CHANGE 4) - I.E. C-II, B-II, A-I (SMALL).

7. NOTE THE DESIGN AIRCRAFT (ARC OR SPECIFIC AIRCRAFT) FOR EACH FACILITY IDENTIFIED IN #4. A DESIGN AIRCRAFT MUST MAKE REGULAR USE OF THE FACILITY. NORMALLY, FAA CONSIDERS REGULAR USE TO BE 500 OR MORE ANNUAL INTINERANT OPERATIONS.

IF THE AIRPORT SERVES A WHOLE FAMILY OF AIRCRAFT IN A PARTICULAR GROUP, THE ARC (I.E. B-II) SHOULD BE SPECIFIED. IF,HOWEVER, THE AIRPORT IS USED BY ONLY 1 OR 2 OF A FAMILY OF AIRCRAFT (IX- BEECH KING AIR C90), THE MOST DEMANDING (APPROACH SPEED, WINGSPAN) AIRCRAFT SHOULD BE SPECIFIED.

8. IDENTIFY THE SPECIFIC NAME OF THE STANDARD THAT IS PROPOSED TO BE MODIFIED FOR THE SUBJECT LOCAL CONDITION.

9. DESCRIBE (WORDS AND NUMBERS) THE DIMENSIONS AND REQUIREMENTS OF THE STANDARD AS PROVIDED IN AC 150/5300-13.

10. STATE THE PROPOSED MODIFICATION TO THE STANDARD.

11. DISCUSS THE LOCAL CONDITIONS THAT MAKE IT IMPRACTICAL OR IMPOSSIBLE TO MEET THE STANDARD.

12. IDENTIFY ALTERNATIVES TO THE SUBJECT PROPOSED MODIFICATION, AND SHOW WHY THESE ALTERNATIVES ARE NOT VIABLE.

13. DISCUSS HOW THE PROPOSED MODIFICATION WOULD IMPACT AIRPORT SAFETY AND EXPLAIN WHY AN ACCEPTABLE LEVEL OF SAFETY, ECONOMY, DURABILITY, AND WORKMANSHIP WOULD STILL EXIST.

14. TYPED NAME AND SIGINATURE OF AIRPORT AUTHORITY REPRESELNTATIVE.

15. SELF-EXPLANATORY.

16. SELF-EXPLANATORY.

17. SELF-EXPLANATORY.

18. TO BE COMPLETED BY FAA.

Outlook

Wendie Kellington Email to Kenji Sugahara (9.25.24)

From Samantha Peterson <SPeterson@CenturyWest.com>
Date Wed 9/25/2024 8:21 AM
To Brandy Steffen <brandy.steffen@jla.us.com>; Jen Winslow <Jen.winslow@jla.us.com>
Cc W. Matt Rogers <WRogers@CenturyWest.com>

Can you also include this email in the public record with the others from Kellington.

Thank you,

Samantha Peterson, C.M., ACE | Sr.Aviation Planner/Project Manager
Century West Engineering
509.833.4526 | speterson@centurywest.com

From: Wendie Kellington <wk@klgpc.com>
Sent: Wednesday, September 25, 2024 7:17 AM
To: SUGAHARA Kenji <Kenji.SUGAHARA@odav.oregon.gov>
Cc: Posegate Stacy C <Stacy.C.Posegate@doj.oregon.gov>; BEACH Anthony <Anthony.BEACH@odav.oregon.gov>; THOMAS Alex R <Alex.R.THOMAS@odav.oregon.gov>; Samantha Peterson <SPeterson@CenturyWest.com>; Ted Millar <tmillar@wwpmi.com>; Tony Helbling - Wilson Construction Company (helbling@wilsonconst.com) <helbling@wilsonconst.com>; Aron Faegre (faegre@earthlink.net) <faegre@earthlink.net>; Rachel Bacon <rb@klgpc.com>
Subject: RE: Meeting last week

Hi Kenji,

Thank you for the note and meeting last week. The effort is appreciated. A few things.

The airport stakeholders sincerely hope that ODAV will take a serious look at the alternative they proposed. Nothing about it is inconsistent with ODAVs objectives and it is consistent with the note below **as well as** FAA requirements. Furthermore, the stakeholders' proposal came with a fully supported MOS! On the latter, the papers that Tony sent confirm that despite FAA's requests otherwise, ODAV has **never submitted** a proper MOS to the FAA. A mere glance at the single MOS ODAV apparently submitted in comparison to the one Mr. Faegre submitted (Faegre's meets the requirements of the FAA/NTSB manual, ODAV's does not) demonstrates why it is unsurprising that FAA did not approve the 'back of napkin' MOS previously submitted by ODAV's prior administration. It is simply impossible to credibly claim that FAA would reject a properly supported MOS – especially one presented for a phased in airport development program. The claim otherwise is fundamentally misguided.

As explained in the alternative that the stakeholders presented, the stakeholders' proposed alternative is far less intrusive, less expensive, less onerous, and more functional than **any alternative** presented in the ODAV process to date. We explained in the stakeholders' submittal that it would be easy to add moving the perimeter fence as a phase 1 item and it would be easy to add to the stakeholder's alternative a phase 2 of moving Highway 551 at the end of the 20-year term if FAA funds that move. We also explained that the idea of ODAV condemning the $300 mm in private investment to move the runway east including destroying business jet hangars and Atlantic is a nonstarter – that alternative effectively destroys the airport for C-II aircraft and is completely contrary to ODAV's legislative mandate in ORS 836.640-642 to support TTF operations, as ODAV must understand. The private aeronautics interests have invested in the airport's

development as the legislature intended creating significant economic development for the area. Destroying their work under any alternative is untenable, inconsistent with all known airport development premises and respectfully, unlawful.

Please understand that it was **impossible for anyone to provide meaningful comments** on the alternatives that ODAV presented. The facts from which all ODAV proposed alternatives flowed were, with respect, faulty and their outcome was untenable - no certain runway extension. ODAV staff mistakenly claimed that FAA required perfect compliance with design standards, and that FAA had refused any MOS in exchange for any runway extension and staff asserted that moving Highway 551 to the west would result in condemnation of many homes and businesses. **Neither are true**. Staff were unable to back up the claim about FAA demands when asked - it was clear something was being missed because the position attributed to FAA is contrary to the CFRs that govern FAA's authority as well as the govern master planning. It turned out that ODAV **never even attempted to submit a properly documented MOS**, making it unsurprising that in the absence of a proper MOS, that FAA expected compliance. And it turns out that the Highway 551 ROW is wide enough for the 20 feet necessary for perfect ROFA compliance **without any apparent need for condemnation of any homes or businesses.** Or at least with a lot less land being needed than the alternatives presented claimed. How much land is needed in truth has never been disclosed.

Further, from our meeting we learned that a 4th ODAV alternative is actually being considered by ODAV– which is an alternative never presented to the PAC. That being one in which airport development is phased in and for which the desperately needed runway extension is not held hostage to infeasible conditions. Given this revelation and the mistaken or at least incomplete factual premises that supported the ODAV alternatives presented on July 30, the stakeholders suggest (and respectfully the rules governing master planning require), that another round of alternatives be presented to the PAC for their input with the following revised elements:

1. Full disclosure about ODAV's phasing proposal – that the runway extension need not be and is not intended to be held hostage to either condemning the private airport development in the east or moving Highway 551 and condemning homes and businesses.
2. Full disclosure that ODAV has never presented a properly documented MOS to FAA and that under a phased approach that FAA will in fact approve a proper MOS so that the runway can be extended in the near term as is desperately needed.
    a. Here the fully documented Faegre MOS is "temporary" in that it supports phase 1 runway extension and phase 2 results in perfect design standard compliance toward the end of the master planning term.
3. Full disclosure about the amount of space within the existing ROW to move Highway 551 west and concerning the extent to which condemning homes or businesses is actually required because it appears such condemnation is not required. What is required in truth?
4. The stakeholders' proposed alternative is presented as an alternative, with
    a. the Faegre properly documented MOS to support phase 1 which would include the runway extension
    b. moving highway 551 to the west within the existing right of way (without condemnation of homes and businesses if that is possible as it appears) as a phase 2 plan
    c. the drainfield in the south remains but is improved per the geotechnical report submitted demonstrating it can be improved to meet FAA standards.
    d. adding the TLM TTF property to the airport boundary as apparently now properly proposed – because it is the last undeveloped property that all KUAO master plans have envisioned be developed with aeronautical uses and TLM has done the work to enable it to support eVTOLs – something that does not exist anywhere else.

We look forward to your thoughts. Thank you. Best, Wendie Kellington

Wendie L. Kellington | Attorney at Law.
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From: SUGAHARA Kenji <Kenji.SUGAHARA@odav.oregon.gov>
Sent: Monday, September 23, 2024 7:45 AM
To: BEACH Anthony <Anthony.BEACH@odav.oregon.gov>; THOMAS Alex R <Alex.R.THOMAS@odav.oregon.gov>; Wendie Kellington <wk@klgpc.com>; Posegate Stacy C <Stacy.C.Posegate@doj.oregon.gov>; Samantha Peterson <speterson@centurywest.com>
Subject: Meeting last week

Wendie!

Thanks for reaching out to ODAV to talk about the comments that you provided on behalf Ted Millar, TLM and AABC concerning the refined alternatives presented to the PAC on July 30, 2024. I also appreciated the opportunity to speak directly with the communities that are and will be affected by ODAV's planning efforts for UAO. It's always important to listen to stakeholders about their concerns and their wishes. I hope our conversation was helpful in understanding ODAV's role in this planning phase and in particular our hope to select an alternative that FAA will support and ultimately agree to extend federal funds to help implement. Like I mentioned in my response to your request for a meeting, I'll be ensuring that all ODAV's communications with its stakeholders are made part of the record. This this email is intended to provide a high-level summary of our discussion today in which you, Anthony Beach, Alex Thomas , Stacy Posegate of DOJ and I attended by teams.

As I explained in our meeting, Chuck Garrison, Director of the Northwest Mountain Region for FAA, has made clear to ODAV that FAA will not fund future projects if the Aurora Airport master plan does not include an ALP that will bring components of the airport up to FAA's standards of compliance. The primary areas of concern, as we have discussed, are the ROFA which extends over and above the Hubbard Highway, OR 551, and the drainfield within the Runway Safety Area supporting your clients' businesses.

I understand that you are asking ODAV to consider another alternative airport layout plan, which you describe in more detail in your letter. You have explained that this alternative should be preferable

because it would not require additional real property or moving OR 551. You have also stated that the current alternatives are unrealistic or unnecessary because they seek to obtain “perfect compliance” with FAA standards. But that, in your opinion, perfect compliance is not required. Rather, FAA has an obligation to consider any modifications requested by the ODAV. You also explained that your clients are extremely concerned with the investment that they have put into this airport and their relationship with ODAV. We take all input and comments seriously.

Please know that the agency’s consultant does intend to prepare a response to your letter which will be added to the record for the next PAC meeting. But, also, as we discussed, we hope that some of your concerns are alleviated as we explained that any project would be phased, meaning that some of the proposed improvements in the selected alternatives could be built as funding is secured for that phase. We also attempted to clarify that ODAV has no present intention of acquiring by condemnation the areas that are marked “reserve” in any of the alternatives. Rather, these are designated as reserve so that ODAV may apply to FAA for federal funds to acquire these properties, should they become available to be used for a future aviation use. Finally, we attempted to explain that FAA has worked with ODAV to identify the standards that ODAV must comply with and it is apparent that FAA will not approve a modification. As Tony explained, FAA has denied ODAV’s attempts to seek modifications in the past. Furthermore, any modification would be temporary and would not present a permanent solution to the need for new development at the airport. As promised, we will locate the documents pertaining to ODAV’s application to FAA and its response and provide you with copies!

Thank you again for meeting with us today. I look forward to seeing you in a few weeks and to working together on this and other important projects.

Thanks again Wendie!

Kenji

KENJI SUGAHARA
OREGON DEPARTMENT OF AVIATION
DIRECTOR

OFFICE 503-378-2340

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Outlook

Re: Aurora State Airport Master Plan Website Comments - Wendie Kellington

From Brandy Steffen <brandy.steffen@jla.us.com>
Date Tue 2024-10-15 5:15 PM
To Wendie Kellington <wk@klgpc.com>
Cc BEACH Anthony <Anthony.BEACH@odav.oregon.gov>

Hi Wendie,

Thanks for your email. We only allow the main PAC representative to be on the panelist side, the alternates are on the attendee side, since we have such a large group. Since Ted is the main member, he is in the panelist area. Feel free to send in comments via the QA section throughout the meeting or through email.

Thanks,
BRANDY STEFFEN | **JLA PUBLIC INVOLVEMENT**
Partner + Senior Program Manager
brandy.steffen@jla.us.com » Schedule a 30 minute meeting

From: Wendie Kellington <wk@klgpc.com>
Sent: Tuesday, October 15, 2024 4:59 PM
To: Brandy Steffen <brandy.steffen@jla.us.com>
Subject: RE: Aurora State Airport Master Plan Website Comments - Wendie Kellington

I represent a PAC member and cannot get into the panel. Will you please admit me to the panel. Thank you. Wendie Kellington

---

From: Brandy Steffen <brandy.steffen@jla.us.com>
Sent: Tuesday, October 15, 2024 1:39 PM
To: Wendie Kellington <wk@klgpc.com>
Cc: BEACH Anthony <Anthony.BEACH@odav.oregon.gov>
Subject: Aurora State Airport Master Plan Website Comments - Wendie Kellington

Hello Wendie,

We have received your comments and questions. We will get back to you as soon as possible.

Thank you,
BRANDY STEFFEN | **JLA PUBLIC INVOLVEMENT**
Partner + Senior Program Manager
brandy.steffen@jla.us.com » Schedule a 30 minute meeting

From: Wendie Kellington <noreply@jotform.com>
Sent: Tuesday, October 15, 2024 9:03 AM
Subject: Re: Aurora State Airport Master Plan Website Comments - Wendie Kellington

Aurora State Airport Master Plan Website Comments

Name	Wendie Kellington
Organization	Kellington Law Group
Comments or questions?	We represent TLM holdings. (1) ODAV's alternatives first presented 7/31/24 stated they were all premised on the claim that FAA said no runway extension could occur unless the Highway 551 ROFA design standard was first met. That is incorrect and that incorrect premise drove all of ODAV's binary 7/31 alternatives. Further, the highway is just 32 feet off of perfect ROFA compliance and ODAV appears to have been unaware that there is plenty of room in the ROW to move the highway to meet the ROFA without taking homes or businesses, because the binary choice ODAV presented was either taking a bunch of homes/businesses to move Hwy 551 west or wiping out significant aeronautical uses at the airport by moving the RW east. Both of those draconian alternatives ODAV presented are wholly unnecessary. (2) FAA never said that no r/w extension can occur without the ROFA first being met. They will absolutely allow the RW to be extended without perfect ROFA concurrent compliance. They just want the master plan to show the ROFA being met by the end of the planning period if funding becomes available. (3) The airport's aeronautical stakeholders presented an airport MP alternative that extended the RW north in the short term to serve the decade-plus long need for safe existing aircraft operations, provided a fully documented MOS demonstrating unequivocally that MOS standards were met, contemplated HWY 551 be moved the 32 ft west after the RW extension happens, and later in the MP planning period and within the existing ROW (taking no homes/businesses), if funding is available. (4) FAA will in fact allow the r/w to be extended without perfect prerequisite ROFA compliance, and ODAV mistakenly presented alternatives premised on the opposite conclusion it attributed to

	FAA. ODAV must present alternatives to the PAC that are in fact consistent with FAA directives. Otherwise, ODAV fails to comply with its citizen involvement/stakeholder involvement obligations. The aeronautical stakeholders alternative with fully justified MOS must be included as an option in a suite of real properly premised alternatives returned to the PAC for comment. (4) Respectfully, there is no justification for any alternative that wipes out any aeronautical uses. Hwy 551 can be moved west within the existing ROW at the end of the MP planning period with minimal private property impacts. Wiping out any aeronautical uses is simply unacceptable and is contrary to ORS 836.640-642 governing ODAV and the entire point of this master planning effort to serve aeronautical uses. Relatedly, there is no justification for each alternative demanding that the septic drainfield to the south be moved to some unknown location that may not even feasibly exist. As the geotechnical report in the record demonstrates, modest improvements to that drainfield make it comply with FAA standards. Nothing justifies moving it. Thank you. I would like to receive email updates.
If you would like a response, please tell us the best way to contact you:	Email Phone
Email	wk@klgpc.com
Phone Number	(503) 804-0535

You can edit this submission and view all your submissions easily.

Outlook

Fw: Chat and Q & A

From Brandy Steffen <brandy.steffen@jla.us.com>
Date Wed 2024-10-16 8:46 AM
To Jen Winslow <Jen.winslow@jla.us.com>; Ashley Balsom <ashley.balsom@jla.us.com>

Thanks,

BRANDY STEFFEN | **JLA PUBLIC INVOLVEMENT**
Senior Program Manager + Partner
She/Her » Why pronouns matter
brandy.steffen@jla.us.com » Office 503-235-5881 » jla.us.com
Meeting + email hours 9 a.m.–5 p.m. Monday–Thursday » Administrative-only hours Friday
Check my availability » Schedule a 30 minute check-in » Email is the best way to reach me; I try to respond within 3 full workdays.

JLA Public Involvement's mission: To create collaborative, meaningful and exceptionally effective public processes that lead to better, more inclusive outcomes.

From: Wendie Kellington <wk@klgpc.com>
Sent: Tuesday, October 15, 2024 6:45:55 PM
To: Brandy Steffen <brandy.steffen@jla.us.com>
Subject: Chat and Q & A

Brandy, this is not a very good public process because the public is foreclosed from seeing the chat. This is all I can see (below), yet there is a lot of discussion based on comments I am not allowed to see for some reason. :

Brandy Steffen, facilitator | JLA to Everyone
BS If you are a PAC member and are in the attendee section, please let me know.

Brandy Steffen, facilitator | JLA to Everyone
BS Just a reminder that we'll be recording the meeting. The recording will be posted to the website in the next 48 hours; the meeting summary will be posted v

Brandy Steffen, facilitator | JLA to Everyone
BS The presentation slides will be posted to the project website following this meeting.

Brandy Steffen, facilitator | JLA to Everyone
BS Here is Ben William's comment which was sent just to me: To Tim's last comment, who is THEY are following advisory circulars? Tim House is the person wh
So no one above Tim House in the FAA Regional Office or Washington office is making these decisions? They are being made locally at the Regional level

Brandy Steffen, facilitator | JLA to Everyone
BS Here is the FAQ: https://publicproject.net/files/2024-01/Aurora-Airport/updated/uao-amp-faq-022024.pdf?6218398d13

Brandy Steffen, facilitator | JLA to Everyone
BS We will come back in 10 minutes. I'll give you a few minute warning.

Brandy Steffen, facilitator | JLA to Everyone
BS We'll get started in a few minutes

Brandy Steffen, facilitator | JLA to Everyone
BS Just a reminder that we'll post these slides on the project website following this meeting tonight.

Jen Winslow | JLA to Everyone
JW If anyone watching the meeting would like to provide comments, please do so on our "contact us" page at https://publicproject.net/AuroraAirport The mee

Outlook

Re: Public records request

From Brandy Steffen <brandy.steffen@jla.us.com>
Date Wed 2024-10-16 4:36 PM
To Wendie Kellington <wk@klgpc.com>
Cc BEACH Anthony <Anthony.BEACH@odav.oregon.gov>; THOMAS Alex R <Alex.R.THOMAS@odav.oregon.gov>

Hello Wendie,

Thanks for your request. The website has been updated with the video, as well as the transcript which includes the full chat and Q&A record. You can find everything at https://publicproject.net/AuroraAirport# on the "meetings" page.

Please let us know if you have any other questions.

Thanks,
BRANDY STEFFEN | **JLA PUBLIC INVOLVEMENT**
Partner + Senior Program Manager
brandy.steffen@jla.us.com » Schedule a 30 minute meeting

From: Wendie Kellington <wk@klgpc.com>
Sent: Tuesday, October 15, 2024 8:08 PM
To: Brandy Steffen <brandy.steffen@jla.us.com>
Subject: Public records request

Brandy,

I request a copy of all comments and Q & A submitted into the zoom meeting tonight that I was foreclosed from seeing. Thank you. Wendie Kellington

Outlook

Fw: PAC Member TLM Holdings, LLC's, Response to Oregon Department of Aviation for December 10 PAC Meeting (ODAV) "Preferred Alternative"

From Brandy Steffen <brandy.steffen@jla.us.com>
Date Mon 2025-01-06 4:49 PM
To Jen Winslow <Jen.winslow@jla.us.com>; Ashley Balsom <ashley.balsom@jla.us.com>

3 attachments (8 MB)

EXH 3 - Exception approving HDSE drainfield.pdf; EXH 1 - Aeronautical Stakeholders Airport Alternative.pdf; EXH 2 - ODAV Analysis of KUAO Private Operations.pdf;

BRANDY STEFFEN | **JLA PUBLIC INVOLVEMENT**
Senior Program Manager + Partner
She/Her » Why pronouns matter
brandy.steffen@jla.us.com » Office 503-235-5881 » jla.us.com
Meeting + email hours 9 a.m.–5 p.m. Monday–Thursday » Administrative-only hours Friday
Check my availability » Schedule a 30 minute check-in

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Please note: I will be on vacation, without access to my email, starting Friday, 01/24/25 and returning Monday, 02/03/25.

From: Wendie Kellington <wk@klgpc.com>
Sent: Tuesday, December 10, 2024 3:42 PM
To: Brandy Steffen <brandy.steffen@jla.us.com>
Cc: THOMAS Alex R <Alex.R.THOMAS@odav.oregon.gov>; Tony Helbling - Wilson Construction Company (helbling@wilsonconst.com) <helbling@wilsonconst.com>; Rachel Bacon <rb@klgpc.com>; Ted Millar <tmillar@wwpmi.com>; Aron Faegre (faegre@earthlink.net) <faegre@earthlink.net>; Tony Beach (anthony.beach@aviation.state.or.us) <anthony.beach@aviation.state.or.us>
Subject: PAC Member TLM Holdings, LLC's, Response to Oregon Department of Aviation for December 10 PAC Meeting (ODAV) "Preferred Alternative"

Hi Brandy,

Attached please find the first of several emails for the record of the above matter which are the exhibits to the letter objection to ODAV's preferred alternative that I submit on behalf of TLM Holdings LLC an ODAV KUAO MP Pac Member. Please confirm receipt. Earlier I asked you if I could send you a link to a dropbox with exhibits and I did not hear from you. Therefore, I am submitting these several exhibits

individually – some split into small enough segments to emails for the record. Attached are Exhibits 1-3. Regards, Wendie Kellington.

Wendie L. Kellington | Attorney at Law.
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Chambers RANKED IN USA 2024
Wendie Kellington

Outlook

Fw: PAC Member TLM Holdings, LLC's, Response to Oregon Department of Aviation for December 10 PAC Meeting (ODAV) "Preferred Alternative"

From Brandy Steffen <brandy.steffen@jla.us.com>
Date Mon 2025-01-06 4:49 PM
To Jen Winslow <Jen.winslow@jla.us.com>; Ashley Balsom <ashley.balsom@jla.us.com>

1 attachment (10 MB)
EXH 4 - 2012 MP_Part1.pdf;

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brandy.steffen@jla.us.com » Office 503-235-5881 » jla.us.com
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From: Wendie Kellington <wk@klgpc.com>
Sent: Tuesday, December 10, 2024 3:45 PM
To: Brandy Steffen <brandy.steffen@jla.us.com>
Cc: THOMAS Alex R <Alex.R.THOMAS@odav.oregon.gov>; Tony Helbling - Wilson Construction Company (helbling@wilsonconst.com) <helbling@wilsonconst.com>; Rachel Bacon <rb@klgpc.com>; Ted Millar <tmillar@wwpmi.com>; Aron Faegre (faegre@earthlink.net) <faegre@earthlink.net>; Tony Beach (anthony.beach@aviation.state.or.us) <anthony.beach@aviation.state.or.us>
Subject: RE: PAC Member TLM Holdings, LLC's, Response to Oregon Department of Aviation for December 10 PAC Meeting (ODAV) "Preferred Alternative"

Hi Brandy,

Per my earlier email, attached is Exhibit 4, Part 1 to PAC Member TLM's letter objection to ODAV's preferred alternative. Please confirm receipt. Regards, Wendie Kellington.

Wendie L. Kellington | Attorney at Law.
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Wendie Kellington

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From Brandy Steffen <brandy.steffen@jla.us.com>
Date Mon 2025-01-06 4:50 PM
To Jen Winslow <Jen.winslow@jla.us.com>; Ashley Balsom <ashley.balsom@jla.us.com>

1 attachment (10 MB)
EXH 4 - 2012 MP_Part2.pdf;

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Senior Program Manager + Partner
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brandy.steffen@jla.us.com » Office 503-235-5881 » jla.us.com
Meeting + email hours 9 a.m.–5 p.m. Monday–Thursday » Administrative-only hours Friday
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To: Brandy Steffen <brandy.steffen@jla.us.com>
Cc: THOMAS Alex R <Alex.R.THOMAS@odav.oregon.gov>; Tony Helbling - Wilson Construction Company (helbling@wilsonconst.com) <helbling@wilsonconst.com>; Rachel Bacon <rb@klgpc.com>; Ted Millar <tmillar@wwpmi.com>; Aron Faegre (faegre@earthlink.net) <faegre@earthlink.net>; Tony Beach (anthony.beach@aviation.state.or.us) <anthony.beach@aviation.state.or.us>
Subject: RE: PAC Member TLM Holdings, LLC's, Response to Oregon Department of Aviation for December 10 PAC Meeting (ODAV) "Preferred Alternative"

Hi Brandy,

Per my earlier email, attached is Exhibit 4, Part 2 to PAC Member TLM's letter objection to ODAV's preferred alternative. Please confirm receipt. Regards, Wendie Kellington.

Wendie L. Kellington | Attorney at Law.
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Chambers RANKED IN USA 2024
Wendie Kellington

Outlook

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From Brandy Steffen <brandy.steffen@jla.us.com>
Date Mon 2025-01-06 4:50 PM
To Jen Winslow <Jen.winslow@jla.us.com>; Ashley Balsom <ashley.balsom@jla.us.com>

1 attachment (5 MB)
EXH 4 - 2012 MP_Part3.pdf;

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Senior Program Manager + Partner
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Subject: RE: PAC Member TLM Holdings, LLC's, Response to Oregon Department of Aviation for December 10 PAC Meeting (ODAV) "Preferred Alternative"

Hi Brandy,

Per my earlier email, attached is Exhibit 4, Part 3 to PAC Member TLM's letter objection to ODAV's preferred alternative. Please confirm receipt. Regards, Wendie Kellington.

Wendie L. Kellington | Attorney at Law.
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Wendie Kellington

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From Brandy Steffen <brandy.steffen@jla.us.com>
Date Mon 2025-01-06 4:50 PM
To Jen Winslow <Jen.winslow@jla.us.com>; Ashley Balsom <ashley.balsom@jla.us.com>

1 attachment (10 MB)
EXH 4 - 2012 MP_Part4.pdf;

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Subject: RE: PAC Member TLM Holdings, LLC's, Response to Oregon Department of Aviation for December 10 PAC Meeting (ODAV) "Preferred Alternative"

Hi Brandy,

Per my earlier email, attached is Exhibit 4, Part 4 to PAC Member TLM's letter objection to ODAV's preferred alternative. Please confirm receipt. Regards, Wendie Kellington.

Wendie L. Kellington | Attorney at Law.
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Date Mon 2025-01-06 4:50 PM
To Jen Winslow <Jen.winslow@jla.us.com>; Ashley Balsom <ashley.balsom@jla.us.com>

1 attachment (10 MB)
EXH 4 - 2012 MP_Part4.pdf;

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Cc: THOMAS Alex R <Alex.R.THOMAS@odav.oregon.gov>; Tony Helbling - Wilson Construction Company (helbling@wilsonconst.com) <helbling@wilsonconst.com>; Rachel Bacon <rb@klgpc.com>; Ted Millar <tmillar@wwpmi.com>; Aron Faegre (faegre@earthlink.net) <faegre@earthlink.net>; Tony Beach (anthony.beach@aviation.state.or.us) <anthony.beach@aviation.state.or.us>
Subject: RE: PAC Member TLM Holdings, LLC's, Response to Oregon Department of Aviation for December 10 PAC Meeting (ODAV) "Preferred Alternative"

Hi Brandy,

Per my earlier email, attached is Exhibit 4, Part 4 to PAC Member TLM's letter objection to ODAV's preferred alternative. Please confirm receipt. Regards, Wendie Kellington.

Wendie L. Kellington | Attorney at Law.
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Wendie Kellington

Outlook

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From Brandy Steffen <brandy.steffen@jla.us.com>
Date Mon 2025-01-06 4:50 PM
To Jen Winslow <Jen.winslow@jla.us.com>; Ashley Balsom <ashley.balsom@jla.us.com>

1 attachment (10 MB)
EXH 4 - 2012 MP_Part5.pdf;

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From: Wendie Kellington <wk@klgpc.com>
Sent: Tuesday, December 10, 2024 3:47 PM
To: Brandy Steffen <brandy.steffen@jla.us.com>
Cc: THOMAS Alex R <Alex.R.THOMAS@odav.oregon.gov>; Tony Helbling - Wilson Construction Company (helbling@wilsonconst.com) <helbling@wilsonconst.com>; Rachel Bacon <rb@klgpc.com>; Ted Millar <tmillar@wwpmi.com>; Aron Faegre (faegre@earthlink.net) <faegre@earthlink.net>; Tony Beach (anthony.beach@aviation.state.or.us) <anthony.beach@aviation.state.or.us>
Subject: RE: PAC Member TLM Holdings, LLC's, Response to Oregon Department of Aviation for December 10 PAC Meeting (ODAV) "Preferred Alternative"

Hi Brandy,

Per my earlier email, attached is Exhibit 4, Part 5 to PAC Member TLM's letter objection to ODAV's preferred alternative. Please confirm receipt. Regards, Wendie Kellington.

Wendie L. Kellington | Attorney at Law.
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Lake Oswego, OR 97035
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Wendie Kellington

Outlook

Fw: PAC Member TLM Holdings, LLC's, Response to Oregon Department of Aviation for December 10 PAC Meeting (ODAV) "Preferred Alternative"

From Brandy Steffen <brandy.steffen@jla.us.com>
Date Mon 2025-01-06 4:50 PM
To Jen Winslow <Jen.winslow@jla.us.com>; Ashley Balsom <ashley.balsom@jla.us.com>

1 attachment (10 MB)
EXH 4 - 2012 MP_Part6.pdf;

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From: Wendie Kellington <wk@klgpc.com>
Sent: Tuesday, December 10, 2024 3:48 PM
To: Brandy Steffen <brandy.steffen@jla.us.com>
Cc: THOMAS Alex R <Alex.R.THOMAS@odav.oregon.gov>; Tony Helbling - Wilson Construction Company (helbling@wilsonconst.com) <helbling@wilsonconst.com>; Rachel Bacon <rb@klgpc.com>; Ted Millar <tmillar@wwpmi.com>; Aron Faegre (faegre@earthlink.net) <faegre@earthlink.net>; Tony Beach (anthony.beach@aviation.state.or.us) <anthony.beach@aviation.state.or.us>
Subject: RE: PAC Member TLM Holdings, LLC's, Response to Oregon Department of Aviation for December 10 PAC Meeting (ODAV) "Preferred Alternative"

Hi Brandy,

Per my earlier email, attached is Exhibit 4, Part 6 to PAC Member TLM's letter objection to ODAV's preferred alternative. Please confirm receipt. Regards, Wendie Kellington.

Wendie L. Kellington | Attorney at Law.
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Lake Oswego, OR 97035
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Chambers RANKED IN USA 2024
Wendie Kellington

Outlook

Fw: PAC Member TLM Holdings, LLC's, Response to Oregon Department of Aviation for December 10 PAC Meeting (ODAV) "Preferred Alternative"

From Brandy Steffen <brandy.steffen@jla.us.com>
Date Mon 2025-01-06 4:50 PM
To Jen Winslow <Jen.winslow@jla.us.com>; Ashley Balsom <ashley.balsom@jla.us.com>

1 attachment (10 MB)
EXH 4 - 2012 MP_Part7.pdf;

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brandy.steffen@jla.us.com » Office 503-235-5881 » jla.us.com
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Sent: Tuesday, December 10, 2024 3:48 PM
To: Brandy Steffen <brandy.steffen@jla.us.com>
Cc: THOMAS Alex R <Alex.R.THOMAS@odav.oregon.gov>; Tony Helbling - Wilson Construction Company (helbling@wilsonconst.com) <helbling@wilsonconst.com>; Rachel Bacon <rb@klgpc.com>; Ted Millar <tmillar@wwpmi.com>; Aron Faegre (faegre@earthlink.net) <faegre@earthlink.net>; Tony Beach (anthony.beach@aviation.state.or.us) <anthony.beach@aviation.state.or.us>
Subject: RE: PAC Member TLM Holdings, LLC's, Response to Oregon Department of Aviation for December 10 PAC Meeting (ODAV) "Preferred Alternative"

Hi Brandy,

Per my earlier email, attached is Exhibit 4, Part 7 to PAC Member TLM's letter objection to ODAV's preferred alternative. Please confirm receipt. Regards, Wendie Kellington.

Wendie L. Kellington | Attorney at Law.
MAILING ADDRESS:
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Chambers RANKED IN USA 2024
Wendie Kellington

Outlook

Fw: PAC Member TLM Holdings, LLC's, Response to Oregon Department of Aviation for December 10 PAC Meeting (ODAV) "Preferred Alternative"

From Brandy Steffen <brandy.steffen@jla.us.com>
Date Mon 2025-01-06 4:51 PM
To Jen Winslow <Jen.winslow@jla.us.com>; Ashley Balsom <ashley.balsom@jla.us.com>

1 attachment (10 MB)
EXH 4 - 2012 MP_Part8.pdf;

BRANDY STEFFEN | **JLA PUBLIC INVOLVEMENT**
Senior Program Manager + Partner
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brandy.steffen@jla.us.com » Office 503-235-5881 » jla.us.com
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Check my availability » Schedule a 30 minute check-in

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Sent: Tuesday, December 10, 2024 3:49 PM
To: Brandy Steffen <brandy.steffen@jla.us.com>
Cc: THOMAS Alex R <Alex.R.THOMAS@odav.oregon.gov>; Tony Helbling - Wilson Construction Company (helbling@wilsonconst.com) <helbling@wilsonconst.com>; Rachel Bacon <rb@klgpc.com>; Ted Millar <tmillar@wwpmi.com>; Aron Faegre (faegre@earthlink.net) <faegre@earthlink.net>; Tony Beach (anthony.beach@aviation.state.or.us) <anthony.beach@aviation.state.or.us>
Subject: RE: PAC Member TLM Holdings, LLC's, Response to Oregon Department of Aviation for December 10 PAC Meeting (ODAV) "Preferred Alternative"

Hi Brandy,

Per my earlier email, attached is Exhibit 4, Part 8 to PAC Member TLM's letter objection to ODAV's preferred alternative. Please confirm receipt. Regards, Wendie Kellington.

Wendie L. Kellington | Attorney at Law.
MAILING ADDRESS:
P.O. Box 2209
Lake Oswego, OR 97035
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Chambers RANKED IN USA 2024
Wendie Kellington

Outlook

Fw: PAC Member TLM Holdings, LLC's, Response to Oregon Department of Aviation for December 10 PAC Meeting (ODAV) "Preferred Alternative"

From Brandy Steffen <brandy.steffen@jla.us.com>
Date Mon 2025-01-06 4:51 PM
To Jen Winslow <Jen.winslow@jla.us.com>; Ashley Balsom <ashley.balsom@jla.us.com>

1 attachment (4 MB)
EXH 4 - 2012 MP_Part9.pdf;

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Meeting + email hours 9 a.m.–5 p.m. Monday–Thursday » Administrative-only hours Friday
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To: Brandy Steffen <brandy.steffen@jla.us.com>
Cc: THOMAS Alex R <Alex.R.THOMAS@odav.oregon.gov>; Tony Helbling - Wilson Construction Company (helbling@wilsonconst.com) <helbling@wilsonconst.com>; Rachel Bacon <rb@klgpc.com>; Ted Millar <tmillar@wwpmi.com>; Aron Faegre (faegre@earthlink.net) <faegre@earthlink.net>; Tony Beach (anthony.beach@aviation.state.or.us) <anthony.beach@aviation.state.or.us>
Subject: RE: PAC Member TLM Holdings, LLC's, Response to Oregon Department of Aviation for December 10 PAC Meeting (ODAV) "Preferred Alternative"

Hi Brandy,

Per my earlier email, attached is Exhibit 4, Part 9 to PAC Member TLM's letter objection to ODAV's preferred alternative. Please confirm receipt. Regards, Wendie Kellington.

Wendie L. Kellington | Attorney at Law.
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EXH 5 - 1976 MP_Part1.pdf;

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Subject: RE: PAC Member TLM Holdings, LLC's, Response to Oregon Department of Aviation for December 10 PAC Meeting (ODAV) "Preferred Alternative"

Hi Brandy,

Per my earlier email, attached is Exhibit 5, part 1 to PAC Member TLM's letter objection to ODAV's preferred alternative. Please confirm receipt. Regards, Wendie Kellington.

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Subject: RE: PAC Member TLM Holdings, LLC's, Response to Oregon Department of Aviation for December 10 PAC Meeting (ODAV) "Preferred Alternative"

Hi Brandy,

Per my earlier email, attached is Exhibit 5, part 2 to PAC Member TLM's letter objection to ODAV's preferred alternative. Please confirm receipt. Regards, Wendie Kellington.

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Subject: RE: PAC Member TLM Holdings, LLC's, Response to Oregon Department of Aviation for December 10 PAC Meeting (ODAV) "Preferred Alternative"

Hi Brandy,

Per my earlier email, attached is Exhibit 5, part 3 to PAC Member TLM's letter objection to ODAV's preferred alternative. Please confirm receipt. Regards, Wendie Kellington.

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Subject: RE: PAC Member TLM Holdings, LLC's, Response to Oregon Department of Aviation for December 10 PAC Meeting (ODAV) "Preferred Alternative"

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EXH 5 - 1976 MP_Part4.pdf;

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Subject: RE: PAC Member TLM Holdings, LLC's, Response to Oregon Department of Aviation for December 10 PAC Meeting (ODAV) "Preferred Alternative"

Hi Brandy,

Per my earlier email, attached is Exhibit 5, part 4 to PAC Member TLM's letter objection to ODAV's preferred alternative. Please confirm receipt. Regards, Wendie Kellington.

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Subject: RE: PAC Member TLM Holdings, LLC's, Response to Oregon Department of Aviation for December 10 PAC Meeting (ODAV) "Preferred Alternative"

Hi Brandy,

Per my earlier email, attached is Exhibit 6 to PAC Member TLM's letter objection to ODAV's preferred alternative. Please confirm receipt. Regards, Wendie Kellington.

KELLINGTON LAW GROUP

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1 attachment (10 MB)
EXH 8 - Taxiway and Runway Access Easement_Part1.pdf;

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Sent: Tuesday, December 10, 2024 3:56 PM
To: Brandy Steffen <brandy.steffen@jla.us.com>
Cc: THOMAS Alex R <Alex.R.THOMAS@odav.oregon.gov>; Tony Helbling - Wilson Construction Company (helbling@wilsonconst.com) <helbling@wilsonconst.com>; Rachel Bacon <rb@klgpc.com>; Ted Millar <tmillar@wwpmi.com>; Aron Faegre (faegre@earthlink.net) <faegre@earthlink.net>; Tony Beach (anthony.beach@aviation.state.or.us) <anthony.beach@aviation.state.or.us>
Subject: RE: PAC Member TLM Holdings, LLC's, Response to Oregon Department of Aviation for December 10 PAC Meeting (ODAV) "Preferred Alternative"

Hi Brandy,

Per my earlier email, attached is Exhibit 8 pt 1 to PAC Member TLM's letter objection to ODAV's preferred alternative. Please confirm receipt. Regards, Wendie Kellington.

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Chambers RANKED IN USA 2024
Wendie Kellington

Outlook

Fw: PAC Member TLM Holdings, LLC's, Response to Oregon Department of Aviation for December 10 PAC Meeting (ODAV) "Preferred Alternative"

From Brandy Steffen <brandy.steffen@jla.us.com>
Date Mon 2025-01-06 4:54 PM
To Jen Winslow <Jen.winslow@jla.us.com>; Ashley Balsom <ashley.balsom@jla.us.com>

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Per my earlier email, attached is Exhibit 8, pt 2 to PAC Member TLM's letter objection to ODAV's preferred alternative. Please confirm receipt. Regards, Wendie Kellington.

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Hi Brandy,

Per my earlier email, attached is Exhibit 9 to PAC Member TLM's letter objection to ODAV's preferred alternative. Please confirm receipt. Regards, Wendie Kellington.

KELLINGTON LAW GROUP

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1 attachment (6 MB)
EXH 9 - HTS.pdf;

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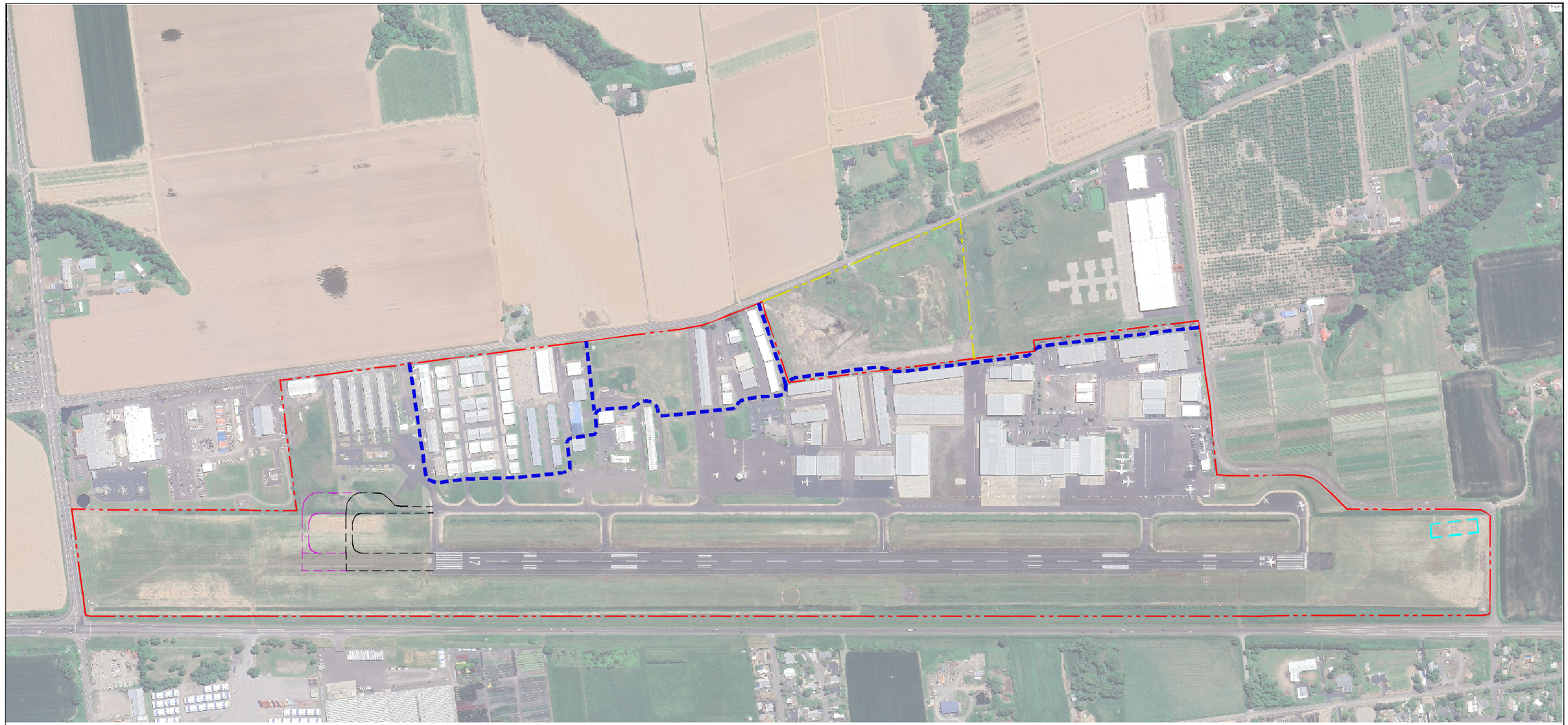
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Chambers RANKED IN USA 2024
Wendie Kellington



NOTES:

1. Continue a Modifications of Standards for the Runway Object Free Area involved with Highway 551 and the west airport perimeter fence, as approved for the 2012 ALP..

SITE PLAN

0 200 400 600

N

KEY

- AIRPORT BOUNDARY
- AIRPORT BOUNDARY ADDITION
- INTERNAL PUBLIC ACCESS ROAD PER 2012 APPROVED ALP
- 500 FT RUNWAY EXTENSION
- 750 FT RUNWAY EXTENSION
- DRAINFIELD TO REMAIN WITH GEOTECH CERTIFICATION IN ACCORDANCE WITH WITH FAA STANDARDS

VERIFY SCALES

BAR IS ONE INCH ON ORIGINAL DRAWING. IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY.

0" 1"

NO.	DATE	BY	APPR.	REVISIONS

ARON FAEGRE AIRPORT PLANNING & DESIGN
13200 Fielding Road, Lake Oswego, Oregon 97034
(503) 880-1469 faegre@earthlink.net

DESIGNED BY:	DRAWN BY:	CHECKED BY:	SCALE:
AF	AF/JH	AF	300' = 1"

DATE: AUGUST 29, 2024

PROJECT: MP – MASTERPLAN ALTERNATIVE TLM

AURORA STATE AIRPORT (UAO)

AURORA STATE AIRPORT – MASTER PLAN ALTERNATIVE TLM

DRAWING

MP-TLM

Working Session: Ensuring Aurora State Airport for the next decade of ORS 836.642 operations.

In 2006, the Oregon legislature directed the Department of Aviation through ORS 836.642 to establish through the fence operations at Aurora State Airport in order to promote economic development. This program has flourished ever since with over 1,000 jobs now tied to the airport. With a new master plan set to set to conclude in 2023 which will set the stage for airport infrastructure for the following decade, it's time for the Oregon Aviation Board to review associated funding and airport management going into the next decade to ensure Aurora State Airport remains the economic engine first envisioned over 15 years ago.

FUNDING

In terms of airport management, Aurora State Airport does generate funds back to the Oregon Department of Aviation of roughly $90 to $100K annually. However, expected expenditures for the next decade significantly exceeds this. As such, additional funding sources need to be identified.

Aurora Profit and Loss Statement By Biennium Not Including FAA & Connect OR Projects

Biennium	Time Frame	Revenues	Expenditures	Profit
2009-2011	July 09-June 11	350,054.00	207,946.00	142,108.00
2011-2013	July 11-June 13	358,373.00	101,576.00	256,797.00
2013-2015	July 13-June 15	400,467.00	121,078.00	279,389.00
2015-2017	July 15-June 17	431,154.00	206,620.00	224,534.00
2017-2019	July 17-June 19	461,857.00	243,618.00	218,239.00
2019-2021	July 19-June 21	457,856.91	277,428.00	180,428.91
Total	**July 09-June 21**	**$ 2,459,761.91**	**$ 1,158,266.00**	**$ 1,301,495.91**

Note: Expenditures include operations and maintenance staff time, utilities and tower expenses. ODA does not fully allocate all related costs (such as accounting or management including the state airport manager)

Anticipated Project List (expected ODA 10% match) - Costs are rough estimates for discussion only

FY 2022:	Easement acquisition supporting obstacle removal	$825,000
FY 2023:	Tree removal	$509,000

FY 2024:	Environmental Assessment for runway extension	$580,000
FY 2024:	Phase 1 Runway Rehab (design)	$373,000
FY 2025:	Phase 2 Runway Rehab (construction)	$2,360,000
FY 2026:	Runway extension Property Purchase	$4,000,000
FY 2026:	Runway extension Design Engineering	$2,275,000
FY 2027:	Runway extension Construction	$26M - $30M
Total:		$37M - $41M
TOTAL ODA Costs		$3.7M - $4.1M

Funding Sources being explored:

- FAA AIP grants – The federal Aviation Administration's Airport Improvement Program provides funding for AIP-eligible projects identified on the airports master plan. The federal share is generally 90%, with a local 10% match.
- Federal Earmark – in addition to AIP grants, Congress members have the opportunity to request directed spending (or earmarks) for specific projects. Although this practice was banned about ten years ago, Congress has recently agreed to begin sponsoring these requests again.
- State Bonding / State Funds
- Federal Transportation Funds from expected Federal infrastructure package
- Connect OR – The OR Department of Transportation has a grant program for marine, rail and aviation. This competitive grant process is generally offered once every two years and requires a 30% local match.
- SOAR – The OR Department of Aviation has a small grant program for repair and capital improvements at the 28 state-owned airports. It is currently paused due to declining revenues related to the pandemic.

STAFFING

Besides being designated for through the fence operations, Aurora is ODA's only Urban General Aviation Airport with a daily total operations of 94,935 versus the next busiest ODA airport at Independence with 33,600 total operations. Aurora is also unique in the amount of revenue produced as well as economic impact with 1,500 on airport jobs versus Independence at 21. Finally, the fast-growing community in which the airport resides is especially sensitive of the issues brought about by grow and requires a level of public engagement unlike any other ODA owned airport. This fact was specifically called out in an earlier Oregon Solutions report, recommending that "ODA, as the owner of the asset, owns the burden of proper communication related to the airport. While it has worked to provided public engagement for planning purposes, the question of how meaningful that engagement was still exists" and in terms of stakeholder communication, "ODA should take a leadership role" in providing forums for communication.

Looking at the data, it's clear Aurora is considerably different than any other airport in ODA's portfolio. So, in addition to reviewing governing structures for Aurora, the question needs to be asked if Aurora has grown beyond what the staffing levels within ODA can give it and if it's time for a level of fulltime staffing.

In contrast to the growing vitality of Aurora State Airport, ODA has seen continuous cuts both in overall staffing and in operations manpower.

2003-05 budget, ODA had 16 FTE, with 5 in Ops.
2007-09, ODA had 17 FTE, with 7 in Ops
2011-13, ODA had 16 FTE, with 7 in Ops
2013-15, ODA had 12.5 FTE, with 5 in Ops.
2015-17, ODA had 12 .25FTE, with 5 in Ops
2017-19 , ODA had 14.25 FTE, with 5 in Ops
2019-21, ODA had 15.5 FTE, with 6.5 in Ops
2021-23, ODA will have 12.5 FTE, with 4.5 in Ops

This is a disturbing trend but doesn't necessarily point towards more dedicated manpower for Aurora State. Rather the Board needs to review expectations for airport management at Aurora and balance them against what ODA can provide. Generally, airport management includes such administrative roles as managing FAA grants, scheduling and documenting meetings, assembling traffic counts, basic accounting, contract management for snow removal, grass cutting, wildlife hazard management, lights and signs maintenance, pavement maintenance and any potential items that may arise. It also includes operational duties including community involvement, i.e., maintain public relations, ensuring the facility is operated in an efficient and safe manner, Contract Tower management/coordination, lease negotiations, manage the through-the-fence operations, airport security, issue NOTAMs, construction management, obstruction removal, conduct regular inspections, etc.

Optimally, two individuals would fulfill these roles: an Airport Manager and an assistant. Should the board want to investigate manning specific to Aurora, initial estimates would be an airport manager salary of $75,000 - $95,000 depending upon experience with an assistant ranging from $60,000 to $75,000.

Unfortunately, there's no specific formula directing when an airport needs full time management as it's heavily influenced by the airport sponsors' desire and the funds available. As a reference, below is a review of other Urban General Aviation Airports similarly classed to Aurora State. These airports support all general aviation aircraft and accommodate corporate aviation activity, including piston and turbine engine aircraft, business jets, helicopters, gliders, and other general aviation activity. The most demanding user requirements are business-related. These airports service a

large/multi-state geographic region or experience high levels of general aviation activity. The minimum runway length objective for Category II airports is 5,000 feet (Oregon Aviation Plan).

Included Airports:

Aurora State Airport
- Airport: 144 acres; Total operations: 66,000
- No dedicated airport manager, State of Oregon acts as airport manager

Portland – Hillsboro Airport
- Airport: 928 acres; Total operations: 199,155
- No dedicated airport manager; Port of Portland acts as airport manager

Bend Municipal Airport
- Airport: 420 acres; Total operations: 141,175.
- Full time airport manager, salary: $81,785.60 - $106,225.60

Portland -Troutdale Airport
- 284 acres; Total operations: 121,977
- No dedicated airport manager; Port of Portland acts as airport manager

McMinnville Municipal Airport
- Airport: 650 acres; Total operations: 63,500
- No dedicated airport manager; FBO serves as airport manager

Scappoose Industrial Airpark
- Airport: 196 acres; Total operations: 60,000
- Full time airport manager

Corvallis Municipal Airport
- Airport: 1,520 acres; Total operations: 52,300
- No dedicated airport manager; Public Works serves as airport manager

Warrenton-Astoria Regional Airport
- Airport: 870 acres; Total operations: 38,721 operations.
- No dedicated airport manager; Port of Astoria serves as airport manager

Salem McNary Field
- Airport: 751 acres; Total operations: 35,657
- Full time airport manager, salary $84,000 - $113,000

Newport Municipal Airport

- Airport: 700 acres; Total operations: 16,000
- Full time airport manager, salary $73,500 - $96,340

LaGrande/Union County Airport

- Airport: 640 acres; Total operations: 16,000
- No dedicated airport manager; Public Works serves as airport manger

GOVERNING STRUCTURES

The Oregon Aviation Board is committed to ensuring airports across the state provide an aviation system that effectively serves our communities, airport users, and the region as a whole. A large part of this responsibility entails direct oversight of the Oregon Department of Aviation and the 28 airports it owns. Of these 28, Aurora State Airport is the largest and most dynamic, supporting 1,500 jobs and contributing over $1.8M to county's general fund in taxes. Ensuring the governing structures remain in sync with the growing airport is a key part of the board's oversight responsibilities for this site.

The major driver of growth at the Aurora State Airport is its unique position within Oregon as the state's largest "through the fence" pilot program. As a state recognized program governed by ORS 836, ODA is tasked to utilize public-private relationships to ensure *"Shared responsibility for: (A) Establishing and meeting the fiscal needs of the pilot site* (ie. test site)*; (B) Maintaining safety of operations; and C) Maintaining positive community relations and compatibility with existing uses. Examples of past public-private ventures at the airport are included as an attached appendix for reference.*

While public-private partnerships have been effective in the past, no guidance exists on when it should be used or what their limits are. As such, there's confusion on expected roles within the decision-making process. Explicitly this revolves around what level of engagement ODA should exercise with the business entities and to what extent those entities should able to influence ODA's actions in its role as the airport sponsor. Because of this, the board should look at whether there are any required changes in policy to eliminate confusion in the future.

In addition to tweaking existing relationships within the existing construct with ODA as the airport sponsor, the board may want to review other ownership possibilities in the name of thoroughness. The reason for this is while the costs of airport operations and maintenance often makes local ownership unfeasible, Aurora State Airport has grown into a healthy, thriving enterprise and is at a point where alternate ownership may be viable. In particular, ORS 836.642 stipulates

(6)To the extent practicable, the airport sponsors shall utilize innovative airport infrastructure and operations funding to support the pilot sites including, but not limited to:

(a)Airport districts as provided in ORS chapter 838;
(b)Economic development programs administered by the Oregon Business Development Department;
(c)Tax increment financing to provide funding for airport-related infrastructure;
(d)United States Department of Agriculture Rural Development grants or low-interest loans; and
(e)Programs, including funding for short line railroads under ORS 367.067 (Short Line Credit Premium Account), designed to facilitate development of intermodal transportation projects. [2005 c.820 §3; 2009 c.398 §2]

So what is an "Airport District"? It is a type of "Special District" authorized via ORS 838 to manage airports and enhance local economies. In general, Special Districts … "are a form of local government created by a local community to meet a specific need. Inadequate revenue bases and competing demands for existing taxes make it difficult for cities and counties to provide all of the services that their constituents want. When residents or landowners want new services or higher levels of existing services, they can form a district to pay for them. Each special district focuses on a specific set of services, like fire protection, water, healthcare, parks and recreation." (Special Districts Association of Oregon). They are funded through property tax revenues or fees charged to customers for services, and also has the authority to issue bonds.

Coos County Airport District is Oregon's only current airport district and oversees the Southwest Regional Airport in North Bend. It was formed, as a Special District, by general election on
December 4, 2002. The District is responsible for the operation of the Southwest Oregon Regional Airport and strives to provide a stable economic base for aviation services for all of Coos County. The District is governed by a Board of five Commissioners elected county wide. The primary duty of the Board is to establish policies for the governance of the District and provide oversight of its daily activities. The Executive Director and staff, operate under the oversight of the District, and are responsible for the operation and maintenance of the airport. The Board established three primary goals for the District in 2003

- Make the District financially independent so that no tax dollars will be required for operations
- Maintain and enhance general and commercial aviation
- Operate and maintain the airport Business Park in support of general and commercial aviation.

Process for Special District Formation. There are three procedures that may be used to form a special district:

- The filing of a petition for formation
- The consent of all property owners within the area of the proposed district
- Initiation and order of the county board (for districts located entirely within its borders).

Once the petition has been approved by the required county agencies, the county must hold a hearing within 30 to 50 days. Upon conclusion of the hearing, the county board will further evaluate the petition according to ORS 199.462. Upon county approval, a final hearing will be held, after which the county enacts formation resolution and an election date is scheduled.

Appendix 1: KUAO Public Private Partnership (Aurora Airport Improvement Association)

KUAO Public Private Partnership:

A list of Historic, On-going, and Planned Examples

Aurora Airport Improvement Association14497 Keil Road
Aurora, Oregon 97002

September 3, 2021

Summary Report

Aurora Airport is an FAA approved "through the fence" type of public airport that is a mix of public and private lands. Most public airports are not this, and have all of their lands owned by the government agency. When all of the land is publicly owned, all of the users are "tenants." Tenants on public land have time-limited leases during which to create their development, and when the lease is over, the development reverts to public ownership. Airport tenants at these airports often point out that at the mid-point of their lease periods, they lose motivation to maintain and improve their development, because they often are forced to move out at the end of the lease.

At Aurora Airport the private properties create additional "owner" relationships with the airport that are different from being a "tenant." Ownership promotes the making of permanent long term investments that retain their value, and that often result in more durableaviation businesses from a community investment and employment standpoint. The uses of the buildings can be more quickly changed to meet market changes, and industry innovations, because ownership also allows rapid redevelopment and re-investment using conventional financing methods of the banking industry.

The essence of a public-private partnerships (often referred to as PPP's) are that they can join the best of the public sector knowledge and abilities, with the best of the private sector knowledge and abilities, to create a better result. As joint owners, they share responsibility for the success of the airport. The private sector owners become partners with the public airport. This makes for a strong combination. The private owners have "skin in the game." For their business to be successful, they need the airport to be successful. There is a built in "win-win" relationship with the airport. For the public side, this means that the private owners put in time, resources, and funds that specifically benefit the public airport as a whole.

Examples of the public-private improvement projects accomplished through the years at Aurora Airport, that provided large public benefits, are listed in the bullets below. For those who want to know more about each bullet item, the following pages provide more details of their history and current status:

1. **2021 – The private side of Aurora Airport annually puts $1.9 million dollars into the local schools, police, fire, and other Marion County services. The businesses at the airport employ 1,500 workers with family wage pay. So the public-private partnership at Aurora Airport uniquely better supports local citizens than a traditional publicly owned airport.**

2. **In 2015, the private sector properties at Aurora Airport joined with ORAVI and OPA to strongly lobby support for HB 2075 to raise the fuel tax rate in Oregon and have those additional funds support airport infrastructure, airport economic development, and the Oregon Department of Aviation. ODA staff were prohibited from advocating for the bill, so private sector support was essential.**
3. **In 2012, the FAA approved the Control Tower project in the 2012 Airport Master Plan, but there were no funds available for it. ODA made clear that they could not advocate for those funds and had to remain neutral. The private sector worked extensively with the Oregon Congressional Delegation during 2013 and 2014 to explain the importance of the Control Tower for airport safety, which resulted in funds becoming available and construction completed in 2015.**
4. **In 2007, to improve the instrument approach capabilities of the airport, the parallel taxiway needed to be relocated to meet FAA's design standard for a greater runway-taxiway centerline separation. Most of the property needed for this relocation was on private properties. There was a friendly and quick agreement created. In 2009, the taxiway relocation was completed.**
5. **In 2005, with Aurora Airport showing the power of using a public-private model for an airport, the legislature approved Senate Bill 680 which instructed all state agencies to use the Aurora Airport as a model airport for how an airport can maximize its Economic Development impact to Oregon and its surrounding communities.**
6. **In 2003, there was agreement that the runway should be reconstructed to add 1000 feet of length and to resurface and groove it for safety. However, there were no FAA funds available for the work at the time. ODA made clear that they could not advocate for those funds and had to remain neutral. The private sector worked extensively with our Congressional Delegation, the FAA, and ODA to get the funding committed for the work. The runway extension was completed in 2004.**
7. **2003 - Creation of the Aurora Airport Water Control District, to solve major fire and life safety needs for all at the airport, led by the needs of private sector, assisted by Marion County, and providing a fire protection water system for the entire ODA airport.**
8. **1999 Agreement to install comprehensive Fencing and Security gates around the entire perimeter of the Airport, paid by Private funds on Private Land, and paid by FAA Public funds on Public Land.**
9. **1999 The Airport Gate colors & Airport Signs were installed on Canby-Hubbard Highway, Keil Road, Arndt Road, and Airport Road, thus creating the Red, Yellow, Purple, Blue, Orange, Green, and Yellow, Gates and Signs around the airport. All of the design, construction, and installation was paid by the private sector. The State agreed to maintain them and pay for the electricity in them.**
10. **1999 – Joint use parking lot developed for state owned public tie-down area with private funds and public on-going maintenance.**
11. **1999 – Joint use septic system developed on leased land from the state, is now shared to provide the needs for the Control Tower toilet facilities.**

12. **1997 - Stenbock Road, the major entry to the public airport lands that have FBO, tie-downs, hangars, and the Control Tower, was created by a public-private partnership.**
13. **1996 Creation of Positive Aurora Airport Management (PAAM) by the private sector, at the request of the public sector, to be the Liaison between the airport users, pilots, the surrounding communities, and anyone interested in be involved in the airport, with the ODA.**
14. **1986 – The private sector willingly sold private land to the state, for the creation of what became the public tie-down, hangar development, and Control Tower Area.**
15. **1968+ - Private sector airport management donated much of the time needed for providing weather reporting, Unicom service and monitoring of the airport runway.**
16. **1943 - As a military airport, the runway was constructed with public funds, and the aircraft aprons were all on private property. This shows that even at the beginning of the airport's existence it was a public-private partnership.**
17. **Miscellaneous examples of the public-private partnership efforts through private efforts that provided: radar coverage to the Aurora Airport area, getting the airport sign on I-5, presentation of WWII aircraft to honor veterans, bringing local retirement home residents for visit, weather reporting that is useful for the public, and many open houses at the airport for the public.**

Consistent with this long history of public-private partnerships at Aurora Airport there are two projects that are just now under way:

- **Private property owners are now negotiating with ODA for a partnership to install an internal circulation road that has been in the FAA and state approved Airport Layout Plan (ALP) since 2012.**

- **Private Property owners are requesting a partnership with ODA to help get the tree removal accomplished as the trees are now potentially going to raise the landing IFR flight altitude minimums needed for safety during periods of low visibility at the airport.**

Detailed Report

There has been a long history of public-private projects accomplished at the Aurora Airport, because a large amount of the developed lands around the airport are on private properties. These properties have been allowed access to the use of the runway and taxiways via a permit system with the state that requires payment of a fee and annual renewal of the access permit. In addition, all fuel sold at the airport pays a tax to the state, which supports the Oregon Department of Aviation and their airport improvement programs.

More important than paying their share of the costs of the airport, through access fees to the runway, is the synergy created by public-partner partnerships. These have allowed for very efficient, low cost, innovative major improvements at Aurora Airport at much reduced cost to the airport, due to the donations of funds, time, and effort by the private sector.

Examples of these public-private improvement projects accomplished through the years, that provided large public benefits, are listed in the bullets below:

1. **2021 – The private side of Aurora Airport annually puts $1.9 million dollars into the local schools, police, fire, and other Marion County services. The businesses at the airport employ 1,500 workers with family wage pay. So the public-private partnership at Aurora Airport uniquely better supports local citizens than a traditional publicly owned airport.**

Most publicly owned development does not pay taxes. However, the private sector pays full taxes on their property development. Thus, at Aurora Airport the private development provides enormous support for governmental services, that most public airports do not provideto their local community. Most recently Marion County records show approximately $250 million value of development at the airport, and this creates $1.9 million in annual taxes paid toMarion County. The taxes next year are expected to be well over $2 million. This supports schools, police, fire, parks, roads, and governmental services for the local area and the county at large. In addition, the approximately 1,500 employees of companies at the airport, pay income taxes as do the employers also pay additional taxes for each employee, which provides great support at the state level for social services, roads, bridges, and administrative services.

2. **In 2015, the private sector properties at Aurora Airport joined with ORAVI and OPA to strongly lobby support for HB 2075 to raise the fuel tax rate in Oregon and have those additional funds support airport infrastructure, airport economic development, and the Oregon Department of Aviation. ODA staff were prohibited from advocating for the bill, so private sector support was essential.**

In 2015 Oregon Aviation Industries Inc. (ORAVI) wrote HB 2075 and called for an increase in the aviation and jet fuel tax rate. The bill was specifically written to support airport infrastructure, economic development, and the ODA administration. The Aurora Airport private sector properties joined with ORAVI and the Oregon Pilots Association (OPA) to strongly support this bill by testifying in the Legislature and contacting their State Representatives and Senators. Thebill was opposed by the Port of Portland and the Airlines because much of the tax revenues

would come from the airlines. The ODA director and staff were told by the Governor that they could not advocate for the tax or have involvement with the bill. The private sector properties recognized the importance of the increase in fuel taxes to maintaining the health of all of Oregon airports. The private sector support ruled the day, and HB 2075 passed and was signed by the Governor.

3. **In 2012, the FAA approved the Control Tower project in the 2012 Airport Master Plan, but there were no funds available for it. The private sector worked extensively with the Oregon Congressional Delegation during 2013 and 2014 to explain the importance of the Control Tower for airport safety, which resulted in funds becoming available and construction completed in 2015.**

The 2012 Airport Master Plan Update confirmed the need for construction of a control tower, as had previous Master Plans. The FAA approved the Control Tower, but there were no funds available for it. ODA made clear that they could not advocate for those funds and had to remain neutral. The private airport sector worked extensively with the Oregon Congressional Delegation during 2013 and 2014 to explain the importance of the Control Tower for safety at the airport. The Congressional delegation working with the FAA was able to find some FAA projects in other Districts that could not meet their deadlines, and the funds could be transferred to Aurora. So in 2015 a control tower was constructed and became operational, in large part because of the private sector efforts.

4. **In 2007, to improve the instrument approach capabilities of the airport, the parallel taxiway needed to be relocated to meet FAA's design standard for a greater runway-taxiway centerline separation. Most of the property needed for this relocation was on private properties. There was a friendly and quick agreement created. In 2009, the taxiway relocation was completed.**

To improve the instrument approach capabilities of the airport, the parallel taxiway needed to be relocated to meet FAA's design standard for a greater runway-taxiway centerline separation. Most of the property needed for this relocation was on private properties. Since it was a win-win for both parties, there was a friendly and quick agreement created so that the state could acquire the needed property. The relocation of the taxiway allowed the minimum descent altitude for the instrument approaches to be lowered, so that the airport was useful when the cloud ceilings were lower. In 2009, the taxiway relocation was completed.

5. **In 2005, with Aurora Airport showing the power of using a public-private model for an airport, the legislature approved Senate Bill 680 which instructed all state agencies to use the Aurora Airport as a model airport for how an airport can maximize its Economic Development impact to Oregon and its surrounding communities.**

Senate Bill 680 called for the Oregon Department of Aviation to use Aurora Airport as the model for how a public-private partnership at an airport could work to create jobs and improved economy for the community. It referenced "through the fence" operations, which is

the aviation lingo for an airport public-private partnership. Its goals to show how rural airportscan encourage development of through the fence operations designed to promote economic development by creating family wage jobs, by increasing local tax bases and by increasing financial support for rural airports.

To the extent practicable, the airport sponsor of a pilot site shall use public-private partnerships that incorporate: (a) Innovative and creative technologies for increasing airport usability and safety; (b) Innovative and creative performance of aviation services to make the services more competitive and useful for the public; (c) Development of the pilot site as a setting for customary and usual aviation-related activities to develop and thrive, in concert with the goals of the Economic and Community Development Department; and (d) Shared responsibility for: (A) Establishing and meeting the fiscal needs of the pilot site; (B) Maintaining safety of operations; and (C) Maintaining positive community relations and compatibility with existing uses. It used Aurora Airport as the model for other airports to follow.

6. **In 2003, there was agreement that the runway should be reconstructed to add 1000 feet of length and to resurface and groove it for safety. However, there were no FAA funds available for the work at the time. ODA made clear that they could not advocate for those funds and had to remain neutral. The private sector worked extensively with our Congressional Delegation, the FAA, and ODA to get the funding committed for the work. The runway extension was completed in 2004.**

In 2003, there was agreement that the time had come when the runway should be reconstructed to add 1000 feet of length and to resurface and groove it for safety. This was part of a runway extension that had been planned since 1976 as part of the airport's master plans. However, there were no FAA funds available for the work at the time. ODA made clear that they could not advocate for those funds and had to remain neutral. The private sector worked extensively with our Congressional Delegation, the FAA, and ODA to get the funding committed for the work. The runway extension was completed in 2004.

7. **2003 - Creation of the Aurora Airport Water Control District, to solve major fire and life safety needs for all at the airport, led by the needs of private sector, assisted by Marion County, and providing a fire protection water system for the entire ODA airport.**

In 1999 Dick VanGrunsven bought a portion of the land in the south end of the airport, with the goal of re-locating his company Van's Aircraft to Aurora Airport. An initial Van's building was designed and submitted to Marion County for building permits. Prior to this time there had been construction of hangars at some of the private lands at the airport. However, this was a moment in time when the building code was changing. In 2000 the International Building Codecame into being to replace the Uniform Building Code. Oregon would be formally adopting thenew IBC in 2004, but the State Fire Marshal wanted to promote safety so advised that, whereasprior large buildings at the airport hadn't needed to have water fire sprinkling, soon that wouldbe a requirement. So Van's first building was allowed to be constructed without fire sprinklering, however the State Fire Marshal said: "no more until you have a fire protection water system at the airport." In reality, each property could have created its own water

system, but that would have meant that there would be the cost of building 10 or more different large reservoirs or tanks for water, with pipes, fire hydrants, and a large pump, each costing upwards of $750,000 each ($1.25m in 2021 dollars). Instead, the land owners all got together and looked at options for creating a common system that would serve all of their properties.

Marion County played a big role in this, helping the joint group of airport private properties and public properties create a "Water District." In 2002 the Aurora Airport Water Control District was created by the Marion County Commissioners, following filing of a petition and testimony of how it was a new requirement for many airport buildings. The AAWCD, now formed, could then go to the USDA Rural Development branch of the federal government and request, and in 2003 received a loan of $703,000 to build a 247,800 gallon underground tank system, a pump house, underground water pipes, fire hydrants, and "T" connections for private sprinkler systems. The State ODA offered up their land for the underground tanks, a well-water for water replenishment of the tanks. In 2004 the system was up and running just as the new IBC code came into effect.

Initial planning and management of the project was done by the private sector as donated time. Where costs were incurred for initial engineering the private sector donated those costs up front. Marion County assisted in the creation of the water district. On opening, the Aurora Fire District performed a water truck caravan training session using multiple fire districts in the area to do the initial filling of the tanks from water in the Willamette River. The Aurora Fire District has continued to use the system for their training exercises, year by year. They have also used the water on occasion for off airport firefighting activities in the community.

The management of the water system is largely done by volunteer effort of the Board of Directors, four of whom are from private properties, and one from State ODA. Thankfully, in the following 17 years there has so far, not been a need for the water system – there have beenno building fires. None-the-less, most of the current buildings have fire sprinklers. Fire marshals often explain the importance of fire sprinklers: if a fire occurs in a building that has a fire sprinkler system, on average one and a half heads go off. This means, the one or two headsthat went off, put the fire out, and that was the end of the problem. Aurora Airport now has this status, thanks to the very strong public-private partnership that accomplished the creation of the Aurora Airport Water Control District.

The AAWCD infrastructure has allowed other important uses at the airport. In 2014 a Control Tower was installed at the airport. This could not have occurred without the availability of Oregon building code required fire protection water. In 2020 the water system was made available to the Oregon Department of Forestry to fight the wild fires burning east and south of Estacada. And today, the presence of Van's Aircraft, Life Flight Network Regional Headquarters, and many other nationally known businesses the 1,500 workers at the airport, was only possible because of that public-private effort.

8. **1999 Agreement to install comprehensive Fencing and Security gates around the entire perimeter of the Airport, paid by Private funds on Private Land, and paid by FAA Public funds on Public Land.**

As the airport grew, in 1999, the need for a major new security fence at the airport was needed. There were major problems with deer and coyotes on the runway, as well as visitors to the airport driving right out onto active operations areas. To best allow for the safe operation of the airport as a whole airport community, private owners and the state came together to design, jointly fund (emphasis added) and construct a comprehensive and completeperimeter fence system. This included the state establishing a common standard for all of the automatically operated sliding security gates. This system improved safety and security by reducing wildlife contacts with aircraft as well as helped reduce the illegal operations of motor vehicles on state airport owned facilities.

9. **1999 The Airport Gate colors & Airport Signs were installed on Canby-Hubbard Highway, Keil Road, Arndt Road, and Airport Road, thus creating the Red, Yellow, Purple, Blue, Orange, Green, and Yellow, Gates and Signs around the airport. All of the design, construction, and installation was paid by the private sector. The State agreed to maintain them and pay for the electricity in them.**

To modernize and improve the image of the airport, in 1999, a public private partnership was formed to create defined Gate colors & Airport Signs. They were installed on Canby-Hubbard Highway, Keil Road, Arndt Road, and Airport Road, thus creating the Red, Yellow, Purple, Blue, Orange, Green, and Yellow, Gates and Signs around the airport. All of the design, construction, and installation was paid by the private sector. The State agreed to maintain them and pay for the electricity in them. designed and emplaced modern signage around the airport. The signage improved surface traffic flow around the airport as well as served to bring the airport an organized image in line with the growing investment in aviation related industry and jobs brought to the airport. This public private partnership project added greatly to making the airport a recognized economic engine of North Marion County.

10. **1999 – Joint use parking lot developed for state owned public tie-down area with private funds and public on-going maintenance.**

The state had developed the public aircraft tie-down area it had acquired, and the Columbia Aviation Association had built a new meeting facility on land it owned. A joint use parking lot was developed in adjacent state owned land, to be used by both groups. The parking lot grading, paving, striping, and light poles were paid for and put in by the CAA, while the ODA agreed maintain the parking lot and pay for the electrical cost for the parking lot lights.

11. **1999 – Joint use septic system developed on leased land from the state, is now shared to provide the needs for the Control Tower toilet facilities.**

The Columbia Aviation Association had built a new meeting facility on land it owned, but needed a septic system. The state leased land for CAA to put in a septic system. And then when the Control Tower was put up, it needed a septic system to connect to for the toilet in theControl Tower, so it was joined to the CAA's septic system, for joint use, since it was on the same state owned land.

12. 1997 - Stenbock Road, the major entry to the public airport lands that have FBO, tie-downs, hangars, and the Control Tower, was created by a public-private partnership.

The entry to the state's public 10 acres of land used to be an odd curving gravel road which still shows up as lines on the county tax map. There was a need for a direct road into the 10 acres that the state had bought. So a public-private deal was created whereby: a) the land area was donated by the private sector as an easement, b) a logger paid by the property owner agreed to cut down the trees, c) a third private sector person (pilot and contractor Brian Cloptan) took out all the stumps, and with that done, d) the state agreed to construct a new asphalt road and maintain it.

13. 1996 Creation of Positive Aurora Airport Management (PAAM) by the private sector, at the request of the public sector, to be the Liaison between the airport users, pilots, the surrounding communities, and anyone interested in be involved in the airport, with the ODA.

In 1996, Aurora State Airport was looked at as a rural, uncontrolled airport, far on the outskirts of the Portland Metropolitan area. Thinking there was nothing important happening at the airport, there arose a significant effort by a minority in the surrounding area to actually close down the airport. In fact the Mayor of the City of Aurora at that time organized a group named "Stop" that had the goal of closing Aurora Airport. Their plan was to create in its place "Williamsburg of the West."

State officials, local owners of airport neighboring properties and private enterprise came together at the request of the Director of ODA (Betsy Johnson at that time) to form the Positive Aurora Airport Management (PAAM). There was a signed agreement that this volunteer group's purpose was to be ODA's laison to the community. PAAM created a forum for all of thevoices of interested parties within and around the airport to talk together and learn from each other. By having all the parties at the table together, hearing each other in real time, it createda place for neighbors to be able to find out what was going on at the airport, and for people at the airport to know what at the airport was affecting neighborhoods around the airport. The PAAM group began in 1996 and has continuously operated ever since.

PAAM focuses on safety, respectful flight operations, noise abatement, surface traffic, discussion of planning efforts for needed improvements, interaction with schools, aviation related training of first responders, coordination of flights during periods of construction, making the airport available for community events, assisting coordination for firefighting, and more. It is a forum for complaints to be heard, solutions proposed, and an effort made to have good relations between the airport and the community. Common involved people attending are:

a. Airport Private Property Owners
b. Airport business heads and managers
c. ODA Director & Staff
d. ODA board members
e. Aircraft users, pilots & mechanics

f. Control tower operators
g. Aurora Fire Department Chief & Staff
h. Marion County Sherriff's Department
i. Clackamas County Sherriff's department
j. Charbonneau Representatives
k. City of Aurora Representatives
l. Contractors doing work on the airport
m. Many others, including interested citizens

Meetings are held weekly on Thursday mornings, with typical attendance by 20 to 40 people. Membership is voluntary and there are no paid staff. So it is funded by the airport private businesses who volunteer their staff to do the work needed of running the meetings, issuing agendas, issuing meeting minutes, and sending out coordination emails. It has been so successful that it has been copied by airports around the nation as a model way to be involved with the interests of the surrounding community.

14. 1986 – The private sector willingly sold private land to the state, for the creation of what became the public tie-down, hangar development, and Control Tower Area.

The 1976 Airport Master Plan pointed out that the State should own more than just the airfield property. A most important aspect of this was that ODA and the FAA wanted there to be a State controlled location for an FBO facility that could guarantee that airport services would always be available to users of the public airport. At one point the ODA reported to the privateowners that the FAA would not continue funding airfield developments at the airport unless some public land was acquired that could guarantee public access. So Bruce's family willingly agreed to sell ten acres to the state in 1986, to solve that problem. This is the land that becamethe ODA's developed public tie-down, FBO, hangar development, and Control Tower Area.

15. 1968+ - Private sector airport management donated much of the time needed for providing weather reporting, Unicom service, and monitoring of the airport runway.

Bruce's company, Aurora Aviation in the days beginning in 1968 assisted in much of the management of the airport. This included having the staff take classes and become certified in weather reporting, including the release of weather balloons. This information was gathered so that when an airplane called in on the radio unicom, his staff would respond on the radio with an airport advisory including weather conditions. This weather information also went hourly into regional weather data used by NOAA. The FBO staff were also the ones who would go out and take care of getting the runway cleared up if a plane was stuck on the runway, such as from landing with wheel gear up. This volunteer effort of the private sector continues to this day, evidenced by Lynx FBO recently clearing a disabled Aircraft off the runway in July of this year.

16. 1943 - As a military airport, the runway was constructed with public funds, and the aircraft aprons were all on private property. This shows that even at the beginning of the airport's existence it was a public-private partnership.

Aurora Airport was constructed in 1943, during World War II by the United States Army Air Forces. At that point in the war the outcome was still in serious question. Just a year prior, a Japanese submarine along the south Oregon coast had launched a floatplane that had dropped incendiary bombs inland, trying to start major forest fires. Another Japanese submarine had fired shells at Fort Stevens near Astoria. It was recognized by the Federal government that there was an essential need to be able to patrol and defend the West Coast with military aircraft from numerous locations in western Oregon. Aurora Airport was constructed and during its initial period was used for patrolling the coast, looking for enemy ships and aircraft, and for pilot training.

Aurora Airport from its beginning, represents a major investment of public tax dollars, to create essential public infrastructure. As a military airport, Aurora Airport was designed, and construction specified, using the standard military criteria of that era. It was established as a 150 foot wide by 4,104 foot long runway. The asphalt pavement was built upon a very thick, heavy gravel base, designed to accommodate the loads of military aircraft. This included the ability to handle medium and heavy bombers such as B-25, B-26, B-17, B-24 and cargo aircraft such as C-45, C46, and C-54. It is particularly interesting that all of the ramp areas used for tiedowns, fueling, and repair of aircraft was on the adjacent private lands. Thus, many of seen the early picture of the PBY's at Aurora Airport. Those are in the area where South End Corporate Airpark is now. In fact, from its beginning in 1943 until the early 1980's ALL development (other than airfield) at the Airport was on private property.

17. **Miscellaneous examples of the public-private partnership efforts through private efforts that provided: radar coverage to the Aurora Airport area, getting the airport sign on I-5, presentation of WWII aircraft to honor veterans, bringing local retirement home residents for visit, weather reporting that is useful for the public, and many open houses at the airport for the public.**

Miscellaneous examples of the public-private partnerships are: 1980's letters from Governor Tom McCall and Aurora Aviation working with the FAA and State government to bring radar coverage to the Aurora Area; Aurora Aviation working with Representative Denny Smith to install an Airport sign on I-5; 12 years that Aurora Aviation sponsored the Collings foundation's "living history" tour of their WWII Aircraft, inviting neighbors to the airport to honor Veterans; 2021 summer visit by "dream flights" bringing hundreds of local retirement home residents to the Airport; the current "AWOS" airport weather system (like the former volunteer manual weather reporting) feeds into the national weather system which in turn provides data for television weather reports for the public; Many open-houses and large airport events since the 1970s through the present inviting the public to view Aurora Airport operations.

The Future

Consistent with this long history of public-private partnerships at Aurora Airport there are two projects that are just now under way:

- **Private property owners are now negotiating with ODA for a partnership to install an internal circulation road that has been in the ALP since 2012.**

- **Private Property owners are requesting a partnership with ODA to help get the tree removal accomplished as the trees are now potentially going to raise the landing IFR flight altitude minimums needed for safety during periods of low visibility at the airport.**

BEFORE THE BOARD OF COMMISSIONERS
FOR MARION COUNTY, OREGON

In the Matter of the	)	Case No. CP 03-4
	)	
Application of:	)	Clerk's File No. 4968
	)	
RICHARD VAN GRUNSVEN	)	COMPREHENSIVE
OF HD AVIATION, TED MILLAR	)	PLAN AMENDMENT
OF SOUTH END AVIATION,	)	
AND JACK HOGAN	)	AN ADMINISTRATIVE ORDINANCE

ORDINANCE NO. 1205

THE MARION COUNTY BOARD OF COMMISSIONERS HEREBY ORDAINS AS FOLLOWS:

SECTION I. **Purpose**

This Ordinance is enacted pursuant to the authority granted to general law counties in the State of Oregon by ORS Chapters 197, 203, and 215 to implement the Marion County Comprehensive Land Use Plan. This ordinance amends the Marion County Comprehensive Plan by taking exceptions to Statewide Land Use Planning Goals 11—Public Facilities and Services and 14—Urbanization for certain properties to share a septic system at the Aurora State Airport. (T4S; R1W; Section 11A; Tax lots 200, 201, 203, and 400) and (T4S; R1W; Section 02D; Tax lots 1100 and 1600).

SECTION II. **Procedural History**

The Marion County Board of Commissioners held a public hearing on September 22, 2004, for which proper public notice and advertisement was given. The purpose of the hearing was to consider proposed amendments to the Marion County Comprehensive Plan to take exceptions to Statewide Land Use Planning Goals 11—Public Facilities and Services and 14—Urbanization for certain properties to share a septic system at the Aurora State Airport. All persons present during the public hearing were given the opportunity to speak or present written statements.

SECTION III. **Adoption of Findings and Conclusion**

The Board has reviewed the evidence and testimony in the record. The amendments to the Marion County Comprehensive Plan made hereunder are based on consideration and analysis of existing Marion County Comprehensive plan goals and policies and zoning regulations and the provision of ORS Chapters 197 and 215, Oregon Administrative Rules 660 Divisions 4, 11, 14, 8, and 33, and the State Land Use Planning Goals.

After careful consideration of all facts and evidence in the record, the Board adopts as its own the Facts and Findings contained in Exhibit A, attached hereto, and by this reference incorporated herein. The properties which are granted goal exceptions are shown on the map attached as Exhibit B, attached hereto, and by this reference incorporated herein.

SECTION IV. Action

The exceptions to Goals 11 and 14 to permit six parcels at the Aurora Airport to share an existing septic disposal system are **GRANTED**.

SECTION VI. Severability

Should any section, subsection, paragraph, sentence, clause, or phrase of this Ordinance or any policy, provision, findings, statement, conclusion, or designation to a particular land use or area of land, or any other portion, segment or element of this Ordinance or of any amendments thereto and adopted hereunder, be declared invalid for any reason, such declaration shall not affect the validity and continued application of any other portion or element of this Ordinance or amendments to the Comprehensive Plan; and if this Ordinance or any portion thereof should be held to be invalid on one ground, but valid on another, it shall be construed that the valid ground is the one upon which this Ordinance of any portion thereof was enacted.

SECTION VII. Effective Date

Pursuant to Ordinance 669, this is an administrative Ordinance and shall take effect 21 days after the adoption and signatures of the Marion County Board of Commissioners.

SIGNED and FINALIZED this 13 day of October, 2004 at Salem, Oregon.

MARION COUNTY BOARD OF COMMISSIONERS

Janet Carlson
Chair

Jan Eastwood
Recording Secretary

JUDICIAL NOTICE

Oregon Revised Statutes (ORS) Chapter 197.830 provides that land use decisions may be reviewed by the Land Use Board of Appeals (LUBA) by filing a notice of intent to appeal within 21 days from the date this ordinance becomes final.

Exhibit A

Facts and Findings:
Exceptions to Goals 11 and 14

BACKGROUND:

In 1999, the applicants received approval from the Oregon Department of Environmental Quality (DEQ) to construct a recirculating gravel filter septic disposal system which was intended to serve six parcels at the southern end of the Aurora. After constructing the system, the applicants were informed by DEQ that Goal 11 forbids the extension of septic lines across property lines and an exception to Goal 11 would have to be taken in order to connect and operate the system.

In June 2003, the applicants applied for a comprehensive plan change to take an exception to Goal 11 to permit shared septic facilities. Staff from the Department of Land Conservation and Development commented that the Goal 11 exception would have to be accompanied with either an exception to Goal 14, because the Public zone at that time did not comply with Goal 14 requirements, or amendments to the Public zone that would bring it into compliance with Goal 14 requirements for rural uses outside of rural communities.

The county was involved in a periodic review task to amend the rural zoning ordinance to comply with Goal 14 and the applicants agreed to place their application on hold until the Goal 14 issues were resolved regarding the Public zone. On July 28, 2004, the Marion County Board of Commissioners adopted amendments to the Marion County Rural Zoning Ordinance which brought the code into compliance with Goal 14 requirements. Subsequently, this application was taken off hold and the applicants requested that the Board call-up the request and hold the first evidentiary hearing. Notice of public hearing was mailed on September 1, 2004 to property owners within 500 feet of the subject parcels. Notice was also published in the Statesman-Journal.

On September 22, 2004, the Board held a public hearing to consider amendments to the Marion County Comprehensive Plan taking exceptions to Goals 11 and 14 for an existing shared septic system for six parcels at the southern end of the Aurora Airport. The Board closed the hearing and directed staff to prepare an ordinance taking those exceptions.

FACTS:

1. The subject properties are designated Public in the Marion County Comprehensive Plan and are correspondingly zoned P (PUBLIC) under the Marion County Rural Zoning Ordinance (MCRZO). The purpose of the Public designation and zone is to provide regulations governing the development of land appropriate for specific public and semi-public uses.

2. The properties are located on the north side of Keil Road NE, approximately 1,700 feet west of the intersection of Airport Road NE and Keil Road. The parcels contain aircraft related facilities and are proposed for additional development in the future.

3. Adjacent properties to the southwest, west, east, and north are zoned P and contain the Aurora Airport and airport related uses and businesses. Properties to the south are zoned EFU (EXCLUSIVE FARM USE) and are devoted to farm use.

4. The airport facility was constructed at this site in 1943 to provide an emergency alternate field for carrier aircraft. It has been in operation as an airport, and zoned public, since that time. Since before 1968, additional land east of the runway and north of Keil Road has also been zoned public and closely associated with the airport. Between 1968 and 1981, properties to the south of Arndt Road and east of the runway were rezoned to public and developed with airport uses. In 1981, the airport facility, and surrounding airport related uses in the public zone, were acknowledged as exceptions in the Marion County Comprehensive Plan.

5. The 1976 Airport Master Plan was adopted by Marion County as part of its comprehensive plan. The adoption included a committed exception area to Statewide Planning Goal 3 of approximately 250 acres at the Aurora State Airport. In 1994, an exception for an additional 1.86 acres was taken and acknowledged to add land to the southwest of the airport. The County's Airport Overlay Zone, Marion County Rural Zoning Ordinance (MCRZO) Chapter 177 has been applied to both the 1981 exception area and the area added in 1994.

6. In Legislative Amendment 03-3, which amended the Marion County Rural Zoning Ordinance to comply with Goal 14 requirements for rural exception areas, an exception to Goal 14 for size of use was approved for airport related uses at the Aurora State Airport due to its being developed with a use that is urban in nature and requiring urban styled development to support the existing uses.

COMMENTS:

7. Marion County Building Inspection commented that based on the information submitted in the attached site plan, Building Inspection cannot make a determination on the permit requirements.

8. The FAA commented, "on-airport development requires submittal to FAA of FAA Form 7460-1, off-airport development requires submittal of separate form 7860-1, concurrence of Oregon Dept. of Aviation required for on-airport development, recommended for off-airport development."

9. All other contacted agencies stated that they had no objections or had not commented at the time the staff report was prepared. All comprehensive plan changes are subject to review by the State Department of Land Conservation and Development (DLCD).

DLCD's comments are contained in the file and explained in the background section of this report.

ANALYSIS:

10. Goal 11—Public Facilities and Services states: "Local Governments shall not allow the establishment or extension of sewer systems outside urban growth boundaries or unincorporated community boundaries...." The Goal defines "extension of a sewer or water system" as "the extension of a pipe, conduit, pipeline, main, or other physical component from or to an existing sewer or water system in order to provide service to a use that was not served by the system on the applicable date of this rule...."

    Goal 14—Urbanization prohibits the establishment of urban services on rural lands and the shared septic facility constitutes a urban level of service as defined by Goal 11. Because of this, an exception to Goal 14 will have to be taken along with an exception to Goal 11.

11. The exception requirements for land physically developed to uses other than those allowed by the applicable goal is set forth in OAR 660-004-0025:

    (1) A local government may adopt an exception to a goal when the land subject to the exception is physically developed to the extent that it is no longer available for uses allowed by the applicable goal.

    (2) Whether land has been physically developed with uses not allowed by an applicable Goal will depend on the situation at the site of the exception. The exact nature and extent of the areas found to be physically developed shall be clearly set forth in the justification for the exception. The specific area(s) must be shown on a map or otherwise described and keyed to the appropriate findings of fact. The findings of fact shall identify the extent and location of the existing physical development on the land and can include information on structures, roads, sewer and water facilities, and utility facilities. Uses allowed by the applicable goal(s) to which an exception is being taken shall not be used to justify a physically developed exception.

12. It was determined previously in Legislative Amendment Case No. 03-3 that the existing airport-related development at the airport exceeds the size limitations for commercial and industrial uses allowed by Goal 14 and the Unincorporated Communities Rule and an exception was talen to permit continued development to occur at a level consistent with existing development at the airport. The Land Use Board of Appeals (LUBA) recognized that the level of development at the airport would likely require exceptions to Goals 11 and 14, referring to the Aurora State Airport as an "urban public facility" and commenting that the text of an exception "probably could be very similar to that required for the proposed exception to Goal 3," an exception which was subsequently acknowledged by LCDC. Murray et al. v. Marion County, 23 Or LUBA 268 (1992).

13. OAR 660-014-0040 sets forth the criteria for taking an exception to Goal 11—Public Facilities and Goal 14—Urbanization:

(1) As used in this rule, "undeveloped rural land" includes all land outside of acknowledged urban growth boundaries except for rural areas committed to urban development. This definition includes all resource and nonresource lands outside of urban growth boundaries. It also includes those lands subject to built and committed exceptions to Goals 3 or 4, but *not* developed at urban density or committed to urban level development.

(2) A county can justify an exception to Goal 14 to allow incorporation of a new city or establishment of new urban development on undeveloped rural land. Reasons which can justify why the policies in Goals 3, 4, 11, and 14 should not apply can include but are not limited to findings that an urban population and urban levels of facilities and services are necessary to support an economic activity which is dependent upon an adjacent or nearby natural resource.

(3) To approve an exception under this rule, a county must also show:

(a) That Goal 2, Part II(c)(1) and (c)(2) are met by showing the proposed urban development cannot be reasonably accommodated in or through expansion of existing urban growth boundaries or by intensification of development at existing rural centers;

(b) That Goal 2, Part II(c)(3) is met by showing the long-term environmental, economic, social and energy consequences resulting from urban development at the proposed site with measures designed to reduce adverse impacts are not significantly more adverse than would typically result from the same proposal being located on other undeveloped rural lands, considering:

(A) Whether the amount of land included within the boundaries of the proposed urban development is appropriate, and

(B) Whether urban development is limited by the air, water, energy and land resources at or available to the proposed site, and whether urban development at the proposed site will adversely affect the air, water, energy and land resources of the surrounding area.

(c) That Goal 2, Part II(c)(4) is met by showing the proposed urban uses are compatible with adjacent uses or will be so rendered through measures designed to reduce adverse impacts considering:

(A) Whether urban development at the proposed site detracts from the ability of existing cities and service districts to provide services; and

(B) Whether the potential for continued resource management of land at present levels surrounding and nearby the site proposed for urban development is assured.

(d) That an appropriate level of public facilities and services are likely to be provided in a timely and efficient manner;

(e) That incorporation of a new city or establishment or new urban development of undeveloped rural land is coordinated with comprehensive plans of affected jurisdictions and consistent with plans that control the area proposed for incorporation.

14. The Aurora Airport has been in place since 1943 and airport related uses have been associated with the airport since before 1968. The airport consists of properties in multiple ownerships providing a wide range of aviation-related and support services such as aircraft instruction, rental, maintenance, charter, sales, avionics sale and repair, aircraft construction, storage, fueling, helicopter maintenance and fueling, aerial photography, and others. This airport provides necessary air transportation services to businesses and individuals in Marion, Clackamas, Washington and Multnomah counties, enhancing the economy of the region and the state. The airport facility depends on its location, and the commercial, industrial and population centers and growth in the area, for its viability and necessity. This state airport facility is uniquely able to provide services to the surrounding rural area and nearby communities, as well as a connection to other urban airports because of it's proximity to the Interstate 5 corridor and Highway 99E, the county roadway system, Clackamas County and the south Metro area. In addition, the need for airport transportation facilities is recognized in the Marion County Comprehensive Plan (MCCP).

The Aurora State Airport is needed to serve the economic and air transportation needs of the surrounding community which is dependent upon the existing location of the airport. The criteria in 13(1) and 13(2) are met.

15. The nearest UGB is that of the City of Aurora, approximately 1500 feet to the southeast of the airport. The land between the existing UGB and the airport boundary is resource land. The City of Aurora originally proposed that the airport be included in the UGB when it was going through acknowledgement; however, this was not approved by LCDC and the UGB was reduced to the present area. It continues to be unreasonable to extend the UGB this distance due to the amount of intervening resource land at this time. There are also no rural centers which could encompass the proposed exception area. The closest rural center, Fargo Interchange, is over 9,000 feet west of the airport. The criterion in 13(3)(a) is met.

16. The criteria in 13(3)(b) require that the long-term environmental, economic, social and energy consequences resulting from urban development at the proposed site not be significantly more adverse than would result from the same proposal being located on

other undeveloped rural lands. Because the Aurora Airport is already developed with airport and airport-related uses, and because of its demonstrated need to be located where it currently is, as explained in #14, there are no alternative locations being considered requiring the use of undeveloped land.

Additionally, information provided by the applicant demonstrates that developing the properties with septic or holding tanks would be much more expensive than using a shared septic system.

Also there are environmental concerns developing with septic systems on the subject properties. The soils on the subject properties are not optimum soils for septic systems and can be difficult to locate a system on an individual property. A shared septic also provides the opportunity to process the effluent in a more complete manner that can be certified to meet Leadership in Energy and Environmental Design (LEED) standards.

Considering the lack of alternatives locations for the airport, as well as the benefits economically and environmentally and the potential for positive affects on the air, water, energy and land resources of properties and surrounding area, the criteria in 13(3)(a) and (b) are met.

17. Public facilities are not provided by any of the surrounding cities or service districts. The airport has existed surrounded by resource land and uses since 1943. During that time there has been no evidence that the airport has reduced the potential for continued resource management of land surrounding the airport. Aside from a runway extension, no expansion of airport facilities has occurred historically and no expansion of facilities is proposed in the airport master plan. There is no evidence that a shared septic system for the subject properties will adversely impact surrounding property uses. The criterion in 13(3)(c) is met.

18. The airport has established an Aurora Airport Water Control District to provide a fire suppression water system. Development on the subject properties would still be limited to the capacity of systems in place, including holding tanks, which would serve the uses. Although the City of Aurora sewer system became operational in 2001, there are no plans to extend the system to the airport, at this time, nor has any determination been made of the capacity of the city system to serve the airport. The criterion in 13(3)(d) is met.

19. No incorporation of a new city or establishment is proposed. Any new urban development of undeveloped rural land will be coordinated with the comprehensive plans of affected jurisdictions and applicable zoning. The criterion in 13(3)(e) is met.

20. OAR 660-004-0018 states that for "physically developed" and "irrevocably committed" exceptions to goals, plan, and zone designations shall authorize a single numeric minimum lot size and shall limit uses, density, and public facilities and services to those:

    (a) Which are the same as the existing land uses on the exception site; or

(b) Which meet the following requirements:

(A) The rural uses, density, and public facilities and services will maintain the land as "Rural Land" as defined by the goals and are consistent with all other applicable Goal requirements; and

(B) The rural uses, density, and public facilities and services will not commit adjacent or nearby resource land to nonresource use as defined in OAR 660-004-0028; and

(c) The rural uses, density, and public facilities and services are compatible with adjacent or nearby resource uses.

21. The proposal does not change the allowable commercial or industrial uses at the airport. The purpose of the exception is to allow a shared septic system to serve six parcels at the airport, consistent with the existing urban level of development already existing at the airport. There is no evidence that an exception to permit a shared septic will not commit adjacent or nearby resource land to nonresource use as defined in OAR 660-004-0028. The proposal satisfies the criterion in 20(a) and (b).

22. The airport has a history of being compatible with adjacent and nearby resources uses since its inception over sixty years ago. There is no evidence that allowing the subject properties to share a septic system will be incompatible with surrounding resource uses. The shared septic will be located on the properties where the septic is shared and will not commit surrounding land to nonresource uses. The surrounding resource uses have also been compatible with airport uses. The master planning process, which the Oregon Department of Aviation recently completed for the airport in 2000, requires consideration of National Environmental Protection Act (NEPA) requirements as well as compatibility with surrounding uses. The proposal satisfies the criterion in 20(c).

23. In addition to providing procedures, the MCCP provides guidelines and policies to ensure compatibility with the adopted comprehensive plan and consistency in the planning process. The first guideline is that the proposal should comply with the Statewide Planning Goals that apply in a particular situation. This proposal must be consistent with all applicable Statewide Planning Goals except Goals 3, 11 and 14 for which exceptions have been taken.

24. The proposal is consistent with Statewide Planning Goal 1—Citizen Involvement, which provides for citizen involvement in the planning process. Notice was sent of the request for goal exceptions. A public hearing will were be held before the Board of Commissioners where concerned citizens will have the opportunity to provide comment and make suggestions.

The application is consistent with Goal 2—Land Use Planning since the proposal is consistent with the County's acknowledged comprehensive plan. Moreover, appropriate analysis of the exception provisions have been provided with regard to Goals 11 and 14.

Goals 3—Agricultural Lands, 4—Forest Lands and 5—Open Spaces, Scenic and Historic Areas, and Natural Resources are not applicable to this proposal.

Because the airport and related uses already exist, and the proposal seeks to maintain development at the existing level of uses and sizes, there is no evidence that the proposal will impact air, water or land resource quality over any impacts of the existing airport. Development within the public zone is subject to standards that address and seek to minimize adverse impacts to surrounding uses and resources. The proposal is consistent with Goal 6—Air, Water and Land Resources Quality.

The airport is not in an area subject to natural disasters; the proposal is consistent with Goal 7—Areas Subject to Natural Disasters and Hazards.

Goal 8—Recreational Needs is not applicable to this proposal.

The proposal is consistent with Goal 9—Economic Development. The subject properties are needed to serve commercial, industrial, and public uses in the surrounding community. Allowing development to continue at sizes commensurate with existing development will sustain the economic viability of the airport. The airport and associated uses provide employment to the area and in the state. Employment at the airport should also increase as use of the airport continues to increase as described in the Aurora State Airport Master Plan.

Goal 10—Housing is not applicable to this proposal.

The proposal is consistent with Goal 12—Transportation because the airport is necessary to serve the aviation needs of users at the airport and the surrounding communities. The location of this airport has also been demonstrated to be necessary because neighboring cities and communities do not provide public airport facilities. In addition, the airport is either bordered by or in close proximity to major road facilities, the Interstate 5 corridor, Hubbard Cutoff Road, Highway 99E, Arndt Road, Keil Road, and Airport Road, which provide the traveling public access to and from the airport for both persons and freight.

Goals 13—Energy Conservation, 15—Willamette River Greenway, 16—Estuarine Resources, 17—Coastal Shorelands, 18—Beaches and Dunes and 19—Ocean Resources do not apply to this proposal.

Overall, the proposal is in compliance with the Statewide Planning Goals or an appropriate exception has been taken.

25. The proposal must also conform to the relevant policies in the comprehensive plan. In discussing this requirement, only relevant comprehensive plan policies will be mentioned.

Rural Services Policy #1: The impact on existing services and the potential for additional facilities should be evaluated when rural development is proposed.

Rural Services Policy #2: It is the intent of Marion County to maintain the rural character of areas outside of urban growth boundaries by allowing those uses that do not increase the potential for urban services.

Rural Services Policy #3: Only facilities and services that are necessary to accommodate planned rural land uses should be provided unless it can be shown that the proposed service will not encourage development inconsistent with maintaining the rural density and character of the area.

Rural Services Policy #4: The sizing of public or private service facilities shall be based on maintaining the rural character of the area. Systems that cannot be cost effective without exceeding the rural densities specified in this Plan shall not be approved. The County shall coordinate with private utilities to ensure that rural development can be serviced efficiently.

Any new development on the subject properties will be airport-related and similar to, and no more intensive than, existing development. There is no evidence that the existence of the airport since 1943 has increased the need for urban services or that the development at the airport has impacted the density or character of the rural area. The shared septic facility reflects the urban nature of uses at the airport while not committing the parcels to a fully urban level of development. The parcels would still be able to be developed with urban facilities once those became available. The proposal complies with the rural development policies.

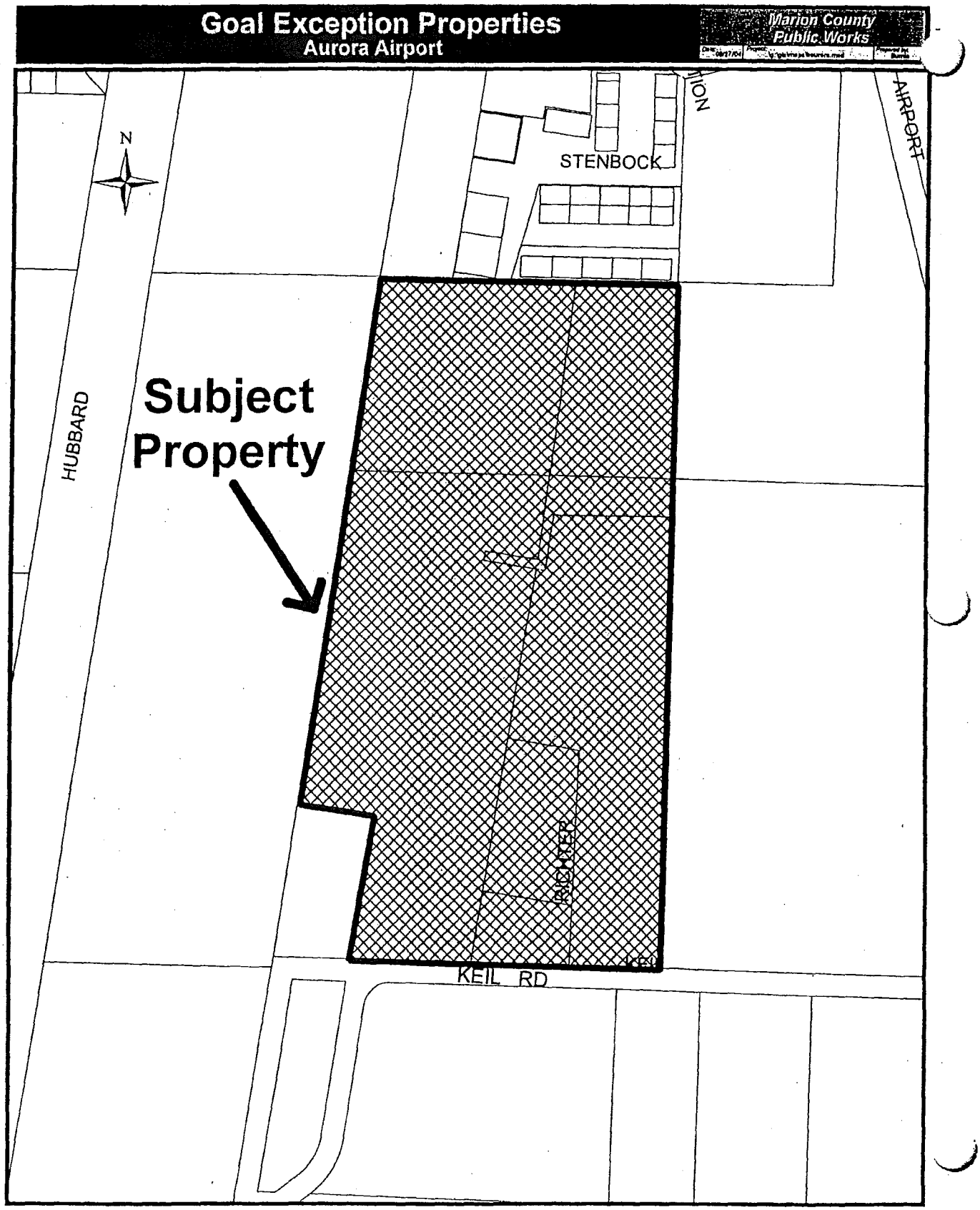
Transportation Policy #8: Airports and airstrips shall be located in areas that are safe for air operations and compatible with surrounding uses.

The existing location of the airport has demonstrated it is in a safe location for air operations. There have been concerns from neighboring residential areas regarding noise at the airport. Efforts have been made over the years to reduce the level of noise associated with airport operations. This proposal will not have an impact on airport operations and, so, will not affect the level of noise produced at the airport. The fact that many of the surrounding lands are in resource zones helps to mitigate the impact of noise from the airport on those lands and surrounding urbanized uses. The proposal complies with applicable transportation policies.

CONCLUSION:

The Board finds that the proposed exceptions meet the applicable criteria in the Oregon Administrative Rules, Oregon Revised Statutes, Statewide Planning Goals, and the Marion County Comprehensive Plan that physically developed and reasons exceptions to Goals 11 and 14 are justified for the subject properties to be able to share a septic system at the Aurora State Airport.

Exhibit B


Goal Exception Properties
Aurora Airport
Marion County
Public Works
N
STENBOCK
AIRPORT
HUBBARD
Subject
Property
KEIL RD

AURORA STATE AIRPORT

Airport Master Plan Update

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TABLE OF CONTENTS

Airport Master Plan Update

Aurora State Airport

Executive Summary

EXECUTIVE SUMMARY ES-1

Chapter 1 – Introduction

GOALS 1-1
Planning Process Goals 1-1
Master Plan Goals 1-2
Goal 1: Enhance safety 1-2
Goal 2: Meet the current and projected needs of airport users, as feasible. 1-2
Goal 3: Consider all the off-airport impacts of Airport development; minimize negative impacts and maximize positive impacts 1-2
ISSUES 1-3
Runway Extension 1-3
Air Traffic Control Tower 1-3
Impact of Airport Expansion on Surrounding Areas 1-3
Calm Wind Runway Change 1-4
Precision Instrument Approach 1-4
Helicopter Operations 1-4
Other Airport Improvements 1-4
AIRPORT ROLE ANALYSIS 1-5
Aurora State Airport's Role within the National System 1-5

Aurora State Airport's Role within the State of Oregon's System 1-5
Aurora State Airport's Regional Role 1-6
Airport Use According to User Survey and FBO Interviews 1-6
Analysis of Airport Service Area and Other Airports in the Service Area 1-6
Airport Role Conclusions and Recommendations 1-14

Chapter 2 – Inventory

BACKGROUND DATA 2-1
Airport Location and Access 2-1
Area Topography 2-2
Climate 2-2
Community and Airport History 2-2
EXISTING FACILITIES 2-3
Airfield Facilities 2-3
Landside Facilities 2-5
Airport Support Facilities 2-6
AIRSPACE 2-7
LAND USE PLANNING AND ZONING 2-8
Existing Airport Environs Zoning and Land Use 2-8
Surrounding Area Zoning and Land Use 2-9
Protection of Airport Airspace 2-9
Ownership/Control of Runway Protection Zones 2-9
ENVIRONMENTAL INVENTORY 2-10
Human Factors 2-10
Natural Factors 2-12
Conclusion 2-14
AVIATION ACTIVITY DATA 2-15
Based Aircraft 2-15
Aircraft Operations 2-15
AIRPORT FINANCIAL DATA 2-16
Airport Operating Revenues and Expenses 2-16

RATES AND CHARGES 2-16

Chapter 3 – Aeronautical Activity Forecasts

NATIONAL AVIATION TRENDS AND FORECASTS 3-3
STATE AVIATION TRENDS AND FORECASTS 3-7
TRENDS AT AURORA STATE AIRPORT 3-7
SOCIOECONOMIC TRENDS AND FORECASTS 3-11
Identification of Core Airport Service Area 3-11
Airport Service Area Population 3-12
Airport Service Area Economy 3-15
BASED AIRCRAFT FORECAST 3-16
U.S. Growth Rate Model. 3-20
Linear Trend Model. 3-21
Population Model. 3-21
Employment Model. 3-21
Terminal Area Forecast. 3-21
System Plan Forecast. 3-21
Last Master Plan Forecast. 3-21
Preferred Forecast 3-22
AIRCRAFT OPERATIONS FORECAST 3-23
Linear Trend Model. 3-26
Terminal Area Forecast. 3-26
System Plan Forecast. 3-26
Last Master Plan Forecast. 3-27
Constant OPBA Model. 3-27
Increasing OPBA Model 3-27
Preferred Forecast 3-27
Operations Fleet Mix Forecast 3-28
Peak Aircraft Operations Forecast 3-29
CRITICAL AIRCRAFT AND AIRPORT REFERENCE CODE 3-30
SUMMARY OF FORECASTS 3-33

Chapter 4 – Facility Requirements

BACKGROUND 4-2
Airport Planning and Development Criteria 4-2
State and Federal Criteria 4-2
Industry Criteria 4-3
AIRFIELD REQUIREMENTS 4-5
Airfield Capacity 4-5
Number and Orientation of Runways 4-7
Airfield Design Standards 4-7
Runway Length 4-9
Runway Length Justification Process 4-10
Runway Width 4-14
Runway Pavement Strength 4-14
Taxiways 4-14
Airport Visual Aids 4-15
Pavement Markings. 4-15
Airfield Signage. 4-15
Airport Lighting 4-15
Beacon 4-15
Visual Approach Aids 4-15
Runway and Taxiway Lighting. 4-15
Radio Navigational Aids & Instrument Approach Procedures 4-16
Radio Navigational Aids. 4-16
Instrument and Noise Abatement Procedures. 4-16
Other Airfield Recommendations 4-17
Traffic Pattern. 4-17
Wind Indicators/Segmented Circle. 4-17
Weather Reporting 4-18
LANDSIDE REQUIREMENTS 4-18
Hangars 4-19
Aprons and Aircraft Parking 4-21

Aviation Businesses and Services 4-23
Air Traffic Control Tower (ACTC) 4-23
SUPPORT FACILITY REQUIREMENTS 4-24
Airport Access 4-24
Aurora State Airport Traffic Summary. 4-27
Airport Road traffic Summary. 4-27
Aurora State Airport Vehicular Traffic Impact to the Boone Bridge 4-27
Future Roadway improvements. 4-28
Recommendations. 4-28
Emergency Services 4-28
Airport Maintenance 4-29
Airport Fencing 4-29
Utilities 4-29
Storm Drainage 4-29
AIRSPACE 4-30
LAND USE PLANNING & ZONING RECOMMENDATIONS 4-30
Zoning Code 4-30
Comprehensive Plan 4-30

Chapter 5 – Alternatives

SUMMARY OF FACILITY REQUIREMENTS 5-1
Airfield Requirements 5-1
Landside Requirements 5-2
AIRPORT DEVELOPMENT ALTERNATIVES 5-3
No Build Alternative 5-4
Build Alternative 1 5-4
Airfield. 5-4
Landside. 5-5
Build Alternative 2 5-5
Airfield. 5-5
Landside. 5-6
Build Alternative 3 5-6

Airfield. 5-6
Landside. 5-6
COMPARISON OF ALTERNATIVES 5-7
NOISE ANALYSIS 5-8
2010 Existing Noise Contours 5-9
2020 No Build Alternative and Build Alternative 3 Noise Contours 5-9
2020 Build Alternative 1 Noise Contours 5-9
2020 Build Alternative 2 Noise Contours 5-9
Noise Analysis Summary 5-9
ENVIRONMENTAL SCREENING OF ALTERNATIVES 5-12
No Build Alternative 5-15
Build Alternative 1 5-15
Build Alternative 2 5-16
Build Alternative 3 5-16
EVALUTION OF ALTERNATIVES 5-18
Master Plan Goals 5-18
Enhance Safety. 5-18
Meet the current and projected needs of airport users, as feasible (feasibility includes financial, environmental, and political). 5-19
Consider all the off-airport impacts of Airport development; minimize negative impacts and maximize positive impacts 5-19
Master Plan Issues 5-19
Runway Extension 5-19
Air Traffic Control Tower 5-20
Impact of Airport Expansion on Surrounding Area 5-20
Calm Wind Runway Change 5-20
Precision Instrument Approach 5-20
Helicopter Operations 5-20
Other Airport Improvements 5-21
PREFERRED ALTERNATIVE 5-21
Airport Reference Code 5-22
Runway Length 5-22

Runway / Pavement Strength....5-24
Instrument Approach Procedures....5-24
Air Traffic Control Tower....5-24
Cargo Apron....5-24
North Run-Up Area....5-25
Relocation of Fuel Tanks....5-25
Aurora Rural Fire Protection District....5-25
Helicopter Parking....5-25
Internal Service Road....5-25
Precision Approach Path Indicators....5-25
Demand-Based Improvements....5-25
CHAPTER 5 APPENDIX....

Chapter 6 – Airport Layout Plan

AIRPORT LAYOUT PLAN DRAWINGS....6-1
Cover Sheet....6-2
Airport Layout Plan....6-2
Airport Airspace....6-2
Airport Approach Surfaces....6-3
Inner Portion of the Runway 17/35 Approach Surfaces Plan....6-4
Terminal Area Plan....6-4
Land Use and Noise Contours Drawings....6-4
Runway Departure Surfaces Drawing....6-5
Airport Property Map....6-5

Chapter 7 – Capital Improvement Plan

CAPITAL IMPROVEMENT PROJECTS....7-1
Phase I....7-1
Phase II....7-2
Phase III....7-4
Project Costs....7-4
FINANCIAL PLAN....7-6

Financial Implementation Analysis Approach 7-6
Airport Rates Comparison 7-7
Capital Funding Sources 7-10
Financial Analysis and Implementation Plan 7-13
Airport Revenues and Expenses 7-14
Projected Airport Operating Revenues and Expenses 7-16
Financial Plan Summary 7-17

Appendices (included in attached CD)

APPENDIX A – Glossary of Terms and Acronyms A-1
APPENDIX B – FAA Correspondence B-1
APPENDIX C – Airport User Survey C-1
APPENDIX D – Instrument Approach Procedures D-1
APPENDIX E – PAC Meeting Summaries E-1
APPENDIX F – Oregon Aviation Plan (OAP) Individual Report F-1
APPENDIX G – PAC Comments Compilation G-1
APPENDIX H – FAA Terminal Area Forecast (TAF) Worksheet H-1
APPENDIX I – Runway Length Survey I-1
APPENDIX J – Traffic Analysis J-1
APPENDIX K – Preferred Alternative Input K-1
APPENDIX L – CIP Cost Estimates L-1

EXECUTIVE SUMMARY

Airport Master Plan Update

Aurora State Airport

The Aurora State Airport Master Plan Update was undertaken to assess the Airport's role, evaluate the Airport's capabilities, forecast future aeronautical activity for the next 20 years, and plan for the timely development of any new or expanded Airport facilities needed to accommodate future aviation activity.

The owner and operator of the Airport, the Oregon Department of Aviation (ODA), obtained and matched a grant from the Federal Aviation Administration (FAA) to fund this study. ODA organized a Planning Advisory Committee (PAC), representing Airport users and neighbors, to participate in the planning process. In addition to six PAC meetings, public involvement in the master plan update included a website to disseminate information and gather comments and questions, and five open houses for the general public.

GOALS & ISSUES IDENTIFIED FOR THE PLAN - CHAPTER 1

Goals and issues for the master plan update were a subject of the first PAC meeting held on July 22, 2010. The common themes of PAC members' goal statements were divided between two categories – goals for the planning process and goals for the Master Plan itself. Issues identified by the PAC, ODA and airport users (via survey) are also included below.

Planning Process Goals

The goals for the planning process guided the conduct of ODA, ODA's consultants, and the PAC throughout the development of the master plan update. Planning process goals were:

- Be open-minded and proceed in good faith.
- Keep the focus more on the long-term future than the short-term future.
- Don't mix unrelated issues and don't be sidetracked by issues that don't relate to the master plan.
- Obtain high quality information for analysis and cite sources.
- Seek consensus for solutions that are acceptable, helpful, and clear.
- By the end of the planning process, establish a clear vision statement that defines what the Airport will be like in the foreseeable future (30 to 50 years) and that is overwhelmingly embraced by all stakeholders. The vision statement should encompass safety, noise, and development scale and flavor.

Master Plan Goals

The Master Plan goals guided the future development of the Airport. When it became time to evaluate alternative layouts for airport development, the goals were used as the evaluation criteria.

- Goal 1: Enhance safety
- Goal 2: Meet the current and projected needs of airport users, as feasible
- Goal 3: Consider all the off-airport impacts of Airport development; minimize negative impacts and maximize positive impacts

Issues

- Runway Extension
- Air Traffic Control Tower
- Impact of Airport Expansion on Surrounding Areas
- Calm Wind Runway Change
- Precision Instrument Approach
- Helicopter Operations (location on public property)

These goals and issues were used throughout the planning process to ensure the Master Plan acknowledged and incorporated concerns from the PAC and general public.

Airport Role Analysis

Aurora State Airport fits well within the OAP 2007 description of an Urban General Aviation Airport, which supports all general aviation aircraft and accommodate corporate aviation activity, including business jets, helicopters, and other general aviation activity. It is one of five GA airports in the region with facilities and services appropriate for business jets. The five airports are Aurora State, Hillsboro, McMinnville, McNary Field in Salem, and Troutdale. These airports are appropriately spaced to provide good accessibility to the population and businesses in the region without substantial service area overlap that might undermine the long-term viability of any of the airports.

The Airport has grown at a faster rate than past planning efforts expected. It has become popular for both personal and business GA use. The growth in business use is likely due to the Airport's location with access to Interstate 5, along with private development adjacent to the state-owned airport property. Considering prior investment in the Airport, its large and growing number of based aircraft, its eligibility for FAA funding, and its proven record for attracting private funding for landside facilities, it appears likely that Aurora State will remain a viable GA airport long into the future.

> Business aviation is anticipated to grow more than personal and recreational aviation, but the Airport's role in the future should not change from its current role—a busy airport handling a full range of GA, including helicopters and business jets.

The Master Plan recommends that Aurora State Airport continue to fulfill its role as an Urban General Aviation Airport.

AIRPORT INVENTORY - CHAPTER 2

An initial step in the planning effort was to collect data pertaining to the Airport and the area it serves. An inventory of the Airport was accomplished through physical observation of existing facilities, interviews with Airport users and business owners, ODA staff, and a review of previous Airport studies and records. Highlights of the information gathered included the information presented in **Table ES-1**.

Table ES-1. Aurora State Airport Inventory

Description	Existing
County	Marion
Ownership	Public (Oregon Department of Aviation)
Acreage	144
Airport Reference Code (ARC)	B-II
Runway Orientation	17/35
Runway Length x Width	5,004' x 100'
Runway Pavement Strength	30,000 lbs (single wheel gear), 45,000 lbs (dual wheel gear)
Taxiway	Parallel
Approach Capabilities	Nonprecision (not lower than 1 statute mile)
Weather Reporting	ASOS (Automated Surface Observing System)
Based Aircraft (2010 data)	354
Annual Operations (2009 data)	89,495

The information gathered as part of this initial step was the foundation for various analyses completed in subsequent chapters of the Plan. An accurate inventory helped to produce an aviation demand forecast that was reasonable and aided in identifying future facility development needs.

AERONAUTICAL ACTIVITY FORECAST - CHAPTER 3

The aeronautical activity forecasts projected were unconstrained and assume ODA or others will be able to develop the various facilities necessary to accommodate based aircraft and future aircraft operations.

ODA has chosen not to constrain the forecasts because undeveloped land to accommodate growth is available.

The primary objective of forecasting was to define the magnitude of change that can be expected over time. Because of the cyclical nature of the economy, it is impossible to predict with certainty year-to-year fluctuations in activity when looking 20 years into the future. However, a trend can be established that characterizes long-term potential. Forecasts serve only as guidelines, and planning must remain flexible to respond to unforeseen changes in aviation activity and resultant facility needs.

Table ES-2. Summary of Forecasts

		2010	2015	2020	2030
Based Aircraft	Jet	23	27	33	47
	Turboprop (Multi-Engine)	16	19	20	26
	Multi-engine Piston	24	24	25	27
	Single Engine	261	276	288	316
	Helicopter	25	28	34	43
	Other	5	5	5	5
	Total	**354**	**379**	**405**	**464**
Aircraft Operations	*Itinerant Operations*				
	Air Taxi	10,000	10,815	11,697	13,682
	GA	48,395	52,354	56,635	66,272
	Military	250	250	250	250
	Subtotal	*58,645*	*63,419*	*68,582*	*80,205*
	Local Operations				
	GA	32,264	34,902	37,756	44,181
	Total	**90,909**	**98,321**	**106,338**	**124,386**
Operations Fleet Mix	Jet	12%	13%	15%	18%
	Turboprop	10%	11%	11%	12%
	Piston	48%	44%	42%	37%
	Helicopter	30%	32%	32%	33%
Peak Operations	Peak Month	10,000	10,815	11,697	13,682
	Design Day	328	355	384	449
	Design Hour	36	39	42	49

Source: WHPacific, Inc.

FACILITY REQUIREMENTS - CHAPTER 4

The following section summarizes the development recommendations given in Chapter 4, *Facility Requirements*, needed to accommodate forecasted aeronautical activity.

Airfield Requirements

- The runway length justification process analysis followed guidance provided in FAA Advisory Circular 150/5300-13, *Airport Design*, and demonstrated it is prudent to plan[1] for a runway extension now. The runway length justification process – approved by ODA, the Oregon Aviation Board, and the FAA – was founded on actual data of aircraft currently operating with constraints, such as reduced payload or shortened stage lengths, and aircraft forecasted to operate at and/or relocate to the Airport within the next five years and exceed 500 annual constrained operations. As a result of the analysis, an extension of at least 1,000 feet was recommended and subsequently approved by the FAA on October 19, 2012 and shown on the approved Airport Layout Plan. The runway length justification process is detailed in Chapter 4[2].

- The current runway strength of 45,000 pounds (dual-wheel gear) is adequate for the existing runway length, as several of the heavier aircraft operating at the Airport are constrained (*i.e.*, reduced fuel load or payload). However, with a runway extension it was recommended the pavement strength be increased to 60,000 pounds (dual-wheel gear), which is the same pavement strength as the parallel taxiway.

- It was recommended the approach lighting system be upgraded to a precision approach path indicator (PAPI).

- ODA should continue to emphasize departure procedures for Runway 17/35, to avoid flight over noise-sensitive areas, and change the altitude limit on left turns when departing Runway 35. (Note: ODA worked with the FAA to create these procedures, which were published in the fall of 2011.)

- A run-up area should be constructed near the northern end of the parallel taxiway to enhance the traffic flow.

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[1] *Planning for a runway extension does not give justification for federal funding. Based on the number of aircraft operations constrained by runway length projected into the future, justification for funding should occur within the 20-year planning period, although not within the next five years.*

[2] *Pages 4-10 through 4-13.*

Landside Requirements

- To meet 2030 hangar demand, approximately 23.0 acres will be needed.
- 25 aircraft parking positions, or approximately 6.5 acres, will be needed for aprons and aircraft parking by 2030. This includes fixed wing and helicopter parking.
- A cargo apron was recommended, per the Oregon Aviation Plan, which requires approximately one acre of land.
- Expansion of a current fixed base operator (FBO) or establishment of a new FBO will likely be needed to accommodate growing activity.
- Fuel tanks owned by Aurora Aviation should be relocated once they have exceeded their useful life, as the current location could better be used for aircraft-related uses. Off-airport operators may want to consider impacts of current fuel tank location and their impacts from future demand
- Approximately 2 acres of land should be reserved for the air traffic control tower (ATCT), parking and security requirements.
- A suitable location for the facility the Aurora Rural Fire Protection District wants to locate at the airport should be identified.
- ODA should work with and support Marion County and the City of Aurora as improvements to Airport Road are considered. The question of funding these improvements should be part of the discussions.

AIRPORT DEVELOPMENT ALTERNATIVES - CHAPTER 5

Four alternatives for the long-term future of the Airport were presented. Generally speaking, the alternatives can be described as such:

- The No Build Alternative assumed maintenance of existing facilities and no expansion of airfield or landside facilities on State-owned property. The Airport would remain designed to ARC B-II standards (approach minima to remain at visual and not lower than 1 sm). Adjacent, through-the-fence operators would still have the option to develop their property as the market demands.
- Build Alternative 1 included a 600-foot extension to the north end of the runway and an instrument approach with visibility not lower than 1 sm. The ARC would remain B-II in this alternative.

- Build Alternative 2 incorporated a 1,000-foot extension to the south end of the runway and improved instrument approach capability (visibility greater than ¾ sm). This alternative reflected improvements to meet the design standards for ARC C-II.

- Build Alternative 3 depicted ARC C-II and instrument approaches with visibility minima lower than ¾ sm (precision approaches). No runway extension was shown on this alternative. However, in order to meet ARC C-II standards, with the lower instrument approach, the parallel taxiway would be relocated 100 feet to the east and multiple buildings would need to be removed or altered.

PREFERRED ALTERNATIVE

On March 10, 2011, the above alternatives were presented to the PAC and public. The purpose of the meeting was to gather input towards developing a preferred alternative. In addition to discussion during the meeting, comment forms were available at the meeting and on the project website, and comments were gathered for two weeks after the meeting. Comments varied greatly, from supporting the No Build Alternative to Airport expansion.

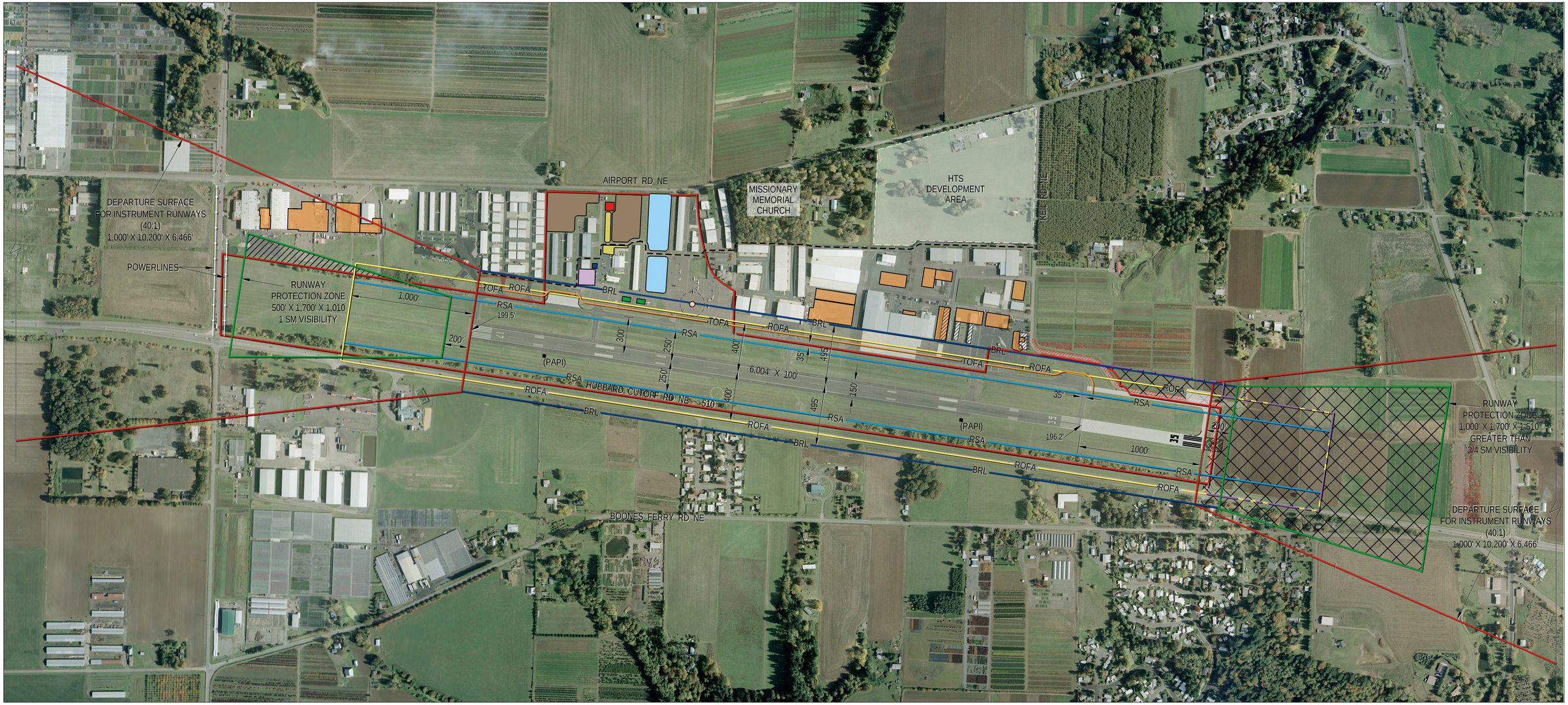
Since no consensus for a Preferred Alternative was reached at the PAC meeting, ODA considered PAC and public comments (gathered through March 24), and then presented a recommended Preferred Alternative for the Oregon Aviation Board's consideration. The Preferred Alternative **Exhibit ES-1** and presented in Chapter 5 as Exhibit 5J was the basis for revising the Airport Layout Plan, which established FAA grant funding eligibility for airport improvements and was approved by the FAA. Implementing the airfield improvements in the Preferred Alternative depends on FAA and ODA funding availability and the results of environmental analyses for individual projects. The private development of landside facilities will depend on the actual growth of aviation demand, market and financing conditions, and local laws and regulations.

AIRPORT LAYOUT PLAN DRAWING SET - CHAPTER 6

The Airport Layout Plan (ALP) drawings are a pictorial culmination of the master planning process. A major purpose of the ALP drawing set is to establish funding eligibility for the FAA's Airport Improvement Program (AIP), as capital projects must appear on an FAA-approved ALP to receive AIP grant funding.

The following sheets are included within the ALP drawing set.

- Cover Sheet. The cover sheet is an index to the airport layout plan drawing set.
- Airport Layout Plan. The ALP depicts the current airport layout and proposed improvements to the Airport for the 20-year planning period. The ALP is a development guide; the timing of development depends upon when it is needed and can be funded.
- Airport Airspace. This drawing shows the Airport Imaginary Surfaces for the future layout of the Airport with a USGS topographic map as the background.



Nov 8, 2012

N

SCALE
400 0 200 400
(FEET)
1 INCH = 400 FT.

Legend

- Property Line
- Future Property Line
- BRL — 35' Building Restriction Line
- RSA — Runway Safety Area
- ROFA — Runway Object Free Area
- TOFA — Taxiway Object Free Area
- Future Service Road
- Existing Buildings
- Future Buildings
- Future Pavement
- Air Traffic Control Tower (ATCT)
- Aurora Rural Fire Protection District
- Future Apron Area
- Cargo Apron
- Vehicular Parking
- Hangar Development
- Fuel Station
- Helicopter Parking
- Precision Approach Path Indicator (PAPI)
- Existing Building Removal
- Future Property Aquisition
- Future Avigation Easement

General Notes

Airport Reference Code (ARC) - C-II
Runway strengthened to 60,000 lbs dual wheel gear

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Aurora State Airport
Aurora, OR

Exhibit ES-1
Preferred Alternative
Revised 11/08/12

ACAD-034317-AIRP-EXES-1_MC_2004.DWG

- Airport Approach Surfaces. This drawing presents a larger scale plan and profile view of the approach surfaces shown in the Airport Airspace Drawing.
- Inner Portion of the Runway 17/35 Approach Surfaces. This drawing provides plan and profile views of the portions of approach surfaces that are closest to the runway, encompassing the existing and ultimate RPZs.
- Terminal Area Plan. The Terminal Area Plan drawing provides a large-scale view of the terminal area.
- Land Use and Noise Contours. A land use map was developed for the Airport and the surrounding area. This map includes the land uses on and around the Airport according to Marion and Clackamas Counties, as applicable.
- Runway Departure Surfaces. The Runway Departure Surfaces Plan depicts the plan and profile views of the Runway 17/35 departure surfaces, which apply to runways with instrument departure procedures.
- Airport Property Map. This drawing provides a history of the ODA's airport property acquisition by showing and listing all land transactions.

CAPITAL IMPROVEMENT PLAN - CHAPTER 7

Through the evaluation of the facility requirements, identification of the Preferred Alternative, and the development of the Airport Layout Plan, the improvements needed at the Aurora State Airport over the next 20-year period were determined. The Capital Improvement Plan (CIP) provided the basis for planning the funding of these improvements. The planned phases of development are in the 5-, 10- and 20-year time frames.

Table ES-3. Aurora State Airport Proposed Capital Improvement Plan with Costs

Aurora State Airport CIP 2012 – 2031							
#	**Year**	**Description**	**Total Cost**	**ODA share**	**FAA Share**	**Private Share**	**Other Funding**
Phase I (2012-2016)							
1	2012	Construct ATCT[1]	3,369,000	423,800	250,000	-	2,695,200
2	2012	Service Road	1,017,000	50,850	966,150	-	-
3	2013	PMP (2013)[2]	27,000	20,250	6,750	-	-
4	2014	Helicopter Landing Pads	11,000	550	10,450	-	-
5	2014	Ramp Reconstruction - State Leased	988,000	49,400	938,600	-	-
6	2014	Taxilane Development (Hangar Access)	43,000	-	-	43,000	-
7	2015	Hangar Development	2,088,000	-	-	2,088,000	-
8	2015	Carryover Entitlements	-	-	-	-	-
9	2016	Environmental Assessment (Runway Improvements)	350,000	17,500	332,500	-	-
10	2016	PMP (2016)	27,000	20,250	6,750	-	-
		Phase I Subtotal	*$7,920,000*	*$582,600*	*$2,511,200*	*$2,131,000*	*$2,695,200*

-Continued on following page-

Aurora State Airport CIP 2012 – 2031							
#	Year	Description	Total Cost	ODA share	FAA Share	Private Share	Other Funding
Phase II (2017-2021)							
11	2017	Aurora RFPD Response Facility	570,000	-	-	570,000	-
12	2017	Carryover Entitlements	-	-	-	-	-
13	2018	Property Acquisition (R35 RPZ)	2,561,000	128,050	2,432,950	-	-
14	2019	Keil Road Relocation	1,427,000	71,350	1,355,650	-	-
15	2020	Runway Extension (R35 - 1000')	3,035,000	151,750	2,883,250	-	-
16	2020	Install Runway 17 PAPIs	65,000	3,250	61,750	-	-
17	2019	PMP (2019)	27,000	20,250	6,750	-	-
18	2019	Taxilane Development (Hangar Access)	43,000	-	-	43,000	-
19	2020	R17/35 Strengthening Overlay	2,052,000	102,600	1,949,400	-	-
20	2021	Hangar Development	2,088,000	-	-	2,088,000	-
21	2021	Master Plan Update	200,000	10,000	190,000	-	-
		Phase II Subtotal	*$12,068,000*	*$487,250*	*$ 8,879,750*	*$2,701,000*	*$ -*
Phase III (2022-2031)							
22	-	PMP (2022, 2025, 2028, 2031)	108,000	81,000	27,000	-	-
23	-	Apron Development	1,638,000	81,900	1,556,100	-	-
24	-	Taxilane Development (Hangar Access)	43,000	-	-	43,000	-
25	-	Hangar Development	2,088,000	-	-	2,088,000	-
26	-	Cargo Apron	198,000	9,900	188,100	-	-
27	-	Relocate Fuel Tanks	89,000	4,450	84,550	-	-
28	-	R17 Run-Up Area[3]	355,000	17,750	337,250	-	-
		Phase III Subtotal	*$ 4,519,000*	*$ 195,000*	*$ 2,193,000*	*$ 2,131,000*	*$ -*
		Total Capital Costs	**$24,507,000**	**$1,264,850**	**$13,583,950**	**$6,963,000**	**$2,695,200**

[1] *Other Funding is Connect Oregon III Grant*
[2] *ODA share for PMP is 75% of total cost*
[3] *If no displaced threshold project; construct R17 run-up at same time as fuel tank relocation project.*

Financial Plan Summary

Based on anticipated CIP project costs and the projected operating income, annual income from the Airport's operation was shown to be sufficient to cover the ODA share of CIP project related costs in Phase I. The ODA share of CIP Phase I costs amounts to $582,600. When projected income was interpolated from the table above for each year FY2011 through FY2016, it was estimated that the Airport could expect about $610,000 in operating income over the 6-year period to go toward CIP projects. Additionally, ODA's projected income during CIP Phases II and III was expected to cover the agency's project share.

The primary goal is for the Airport to evolve into a facility that will best serve the air transportation needs of the region while simultaneously developing into a self-sustaining economic generator. This Master Plan Update can best be described as being the road map to helping the Airport achieve these goals. But it should be recognized that planning is a continuous process that does not end with the completion of the Master Plan in that the fundamental basic issues that have driven this Master Plan will remain valid for many years. Therefore, the ability to continuously monitor the existing and forecast status of airport activity will be a key ingredient in maintaining the applicability and relevance of this study.

CONTINUATION OF THE MASTER PLAN PROCESS

The FAA approved the ALP on October 19, 2012 (included as **Appendix B**). As stated in the Master Plan, ODA should consider working with Marion County to incorporate this document into the County's Comprehensive Plan. Additionally, the Master Plan should be a living document used to aid in decision-making, especially when prioritizing future projects based on demand.

Chapter One: INTRODUCTION

Airport Master Plan Update

Aurora State Airport

This update to the 2000 Airport Master Plan was undertaken to assess the role of the Aurora State Airport (Airport), evaluate the Airport's capabilities, forecast future aeronautical activity for the next 20 years, and plan for the timely development of any new or expanded Airport facilities needed to accommodate future aviation activity.

The owner and operator of the Airport, the Oregon Department of Aviation (ODA), obtained and matched a grant from the Federal Aviation Administration (FAA) to fund this study. ODA has organized a Planning Advisory Committee (PAC), representing Airport users and neighbors, to participate in the planning process. In addition to six PAC meetings, public involvement in the master plan update includes a website to disseminate information and gather comments and questions, and five open houses for the general public.

The purpose of this first draft chapter of the Airport Master Plan Update (Plan) is threefold:

- to summarize major issues that the Plan should address
- to identify goals for the planning process and for the future development of the Airport
- to determine the Airport's current and future role within the system of airports

GOALS

Goals for the master plan update were a subject of the first PAC meeting held on July 22, 2010. The common themes of PAC members' statements have been synthesized and are presented below.

The goals are divided between two categories – goals for the planning process and goals for the master plan itself.

Planning Process Goals

The goals for the planning process should guide the conduct of the ODA, ODA's consultants, and the PAC throughout the development of the master plan update. Planning process goals are:

- Be open-minded and proceed in good faith.

- Keep the focus more on the long-term future than the short-term future.
- Don't mix unrelated issues and don't be sidetracked by issues that don't relate to the master plan.
- Obtain high quality information for analysis and cite sources.
- Seek consensus for solutions that are acceptable, helpful, and clear.
- By the end of the planning process, establish a clear vision statement that defines what the Airport will be like in the foreseeable future (30 to 50 years) and that is overwhelmingly embraced by all stakeholders. The vision statement should encompass safety, noise, and development scale and flavor.

Master Plan Goals

The master plan goals should guide the future development of the Airport. When it is time to evaluate alternative layouts for airport development, the goals should be the evaluation criteria.

Goal 1: Enhance safety.

Safety as a goal has broad support from PAC members, airport users, ODA, and the FAA. While aviation safety is the primary concern, the Plan should enhance other aspects of safety at the Airport, including vehicular and pedestrian safety. The primary way to enhance aviation safety is to comply with FAA airport design standards and other FAA guidance. The FAA and State have standards for land use compatibility that address the protection of people around airports from aviation accidents and aircraft noise, as well as the protection of aviators. Security is another component of aviation safety, so the master plan should comply with Transportation Security Administration recommendations for general aviation (GA) airports.

Goal 2: Meet the current and projected needs of airport users, as feasible.

Some PAC members who are airport users fear that community concerns will unduly constrain the growth of the Airport to meet their needs and the needs of businesses in the Airport's service area. They note that the Airport is a significant component of the national airspace system and should fulfill its role within the system. The areas of feasibility that could restrict the Airport from growing to meet users' needs include financial feasibility, environmental feasibility, and political feasibility. The financial feasibility of airfield expansion depends primarily on obtaining FAA grant funding; airfield improvements that do not meet FAA's standards for justifying need probably will not be built. The financial feasibility of landside development (hangars, etc.) depends primarily on market demand and the availability of private financing. In normal economic times, private financing is available if the demand for the facilities truly exists. Environmental feasibility depends upon the ability to mitigate negative impacts of airport development on the natural and manmade environment. Political feasibility depends upon the adoption of the Master Plan by Marion County and on support for the Master Plan by surrounding jurisdictions.

Goal 3: Consider all the off-airport impacts of Airport development; minimize negative impacts and maximize positive impacts.

The PAC expressed several objectives that relate to this goal:

- Involve all communities and jurisdictions in the Airport's influence area.

- Protect farming and farmland.
- Protect the livability of surrounding communities.
- Evaluate and minimize the impacts of airport growth on off-airport infrastructure, including ground and air transportation, fire protection, water, and sewer systems.
- Evaluate and maximize economic benefit.
- Balance the costs and benefits of airport development.

ISSUES

Issues that the master plan update should address were a subject of the first PAC meeting held on July 22, 2010. Other sources for issue identification were ODA and an Airport user survey that was conducted in the fall of 2009. (See the appendices for a summary of the Airport user survey.) The major issues are outlined below.

Runway Extension

Some Airport users report there are times that they must lessen their airplane's weight in order to depart from the Airport. Reducing weight means fewer passengers, less cargo, or, most often, less fuel—requiring them to make more refueling stops than the range of their aircraft requires. On hot days, some operators may reschedule a flight to a cooler time of day, due to the effect temperature has on the aircraft's takeoff performance. Some Airport users and businesses favor a runway extension of up to 1,500 feet, as expressed in a public meeting. The revenue of some businesses would increase if more fuel could be sold for the constrained aircraft and if more aircraft types could use the Airport. Airport neighbors are concerned that a runway extension would unduly disrupt the area and their quality of life, and encourage more and louder aircraft.

Air Traffic Control Tower

The FAA has performed a cost-benefit analysis that justified an air traffic control tower at the Airport. ODA has been seeking funding for building and operating the tower. Some PAC members and others have expressed concern that a control tower will increase traffic and noise at the Airport. They feel that the tower needs to be vetted by the current master planning process. Many Airport users feel strongly that a control tower is needed for safety. However, some Airport users do not want a control tower at the Airport because it would change the classification of airspace around the Airport and increase the requirements for pilot communication. At this time, the FAA and ODA have slowed down a control tower siting study to make better planning decisions when considering tower location and design.

Impact of Airport Expansion on Surrounding Areas

Concerns about Airport expansion include the effects on the capacity of surrounding infrastructure and environmental impacts.

Neighboring jurisdictions fear that off-Airport roads and utility systems cannot handle increased usage from Airport growth. The Aurora Fire District is concerned about having enough equipment and people to protect expanded Airport facilities. On the other hand, Airport businesses want to be able to grow, and Airport users want utility improvements, particularly sewer service, for existing and future facilities.

For example, the lack of sewer service is a major constraint for having a restaurant at the Airport. While ODA recognizes the complexities of Oregon's land use system and potential need for upgrades to City of Aurora utilities prior to annexation, ODA is generally supportive of annexation of the Airport by the City of Aurora due to the economic growth potential for the Airport if it were connected to City services.

Airport neighbors are also concerned about noise and other possible Airport impacts that could degrade the rural character, quality of life, and natural environment of the area.

Calm Wind Runway Change

When winds are calm, pilots are advised to use Runway 35 (northerly traffic flow) to reduce noise impact on surrounding areas. However, the favored instrument approach is to Runway 17 (southerly traffic flow), which results in conflicting traffic patterns and safety concerns. Several Airport users support designating Runway 17 as the calm wind runway, as it once was. Noise impact would move with the traffic, a concern for Airport neighbors. Residents from the Charbonneau area report the calm wind runway has never lessened their noise exposure, so reverting the calm wind runway is not a major concern.

Precision Instrument Approach

Business aviators especially would like to see the Airport's instrument approach capability upgraded from nonprecision to precision. A precision approach would allow them to land in lower visibility conditions. A precision approach could change the size of some FAA-required safety clearances, particularly at runway ends, which might affect Airport neighbors.

Helicopter Operations

Aurora State Airport has a large number of based and transient helicopter operations. Helicopters operating close to small fixed wing aircraft can be a concern, because of the potential damage to the fixed wing airplanes from rotorwash. Currently, most helicopters takeoff and land on tenant or private property. An area available to the public for the takeoff, landing, and parking of helicopters on ODA land may be needed. Airport users and businesses are likely not to agree on a location or need for a new public helicopter area.

Other Airport Improvements

Suggestions for Airport improvements have been made through the Airport user survey and interviews. These suggestions include internal road improvements, a run-up area for Runway 17, improved runway lighting, a restaurant, and radar/approach control coverage in the area. These improvements are not contentious, and will be analyzed later in the planning process, along with improvements resulting from the analysis of Airport capacity vs. demand, FAA design standards, TSA guidance, and industry standards. The PAC, Airport users, and others will have the opportunity to review the full range of Airport improvements that ODA considers in this Master Plan Update.

AIRPORT ROLE ANALYSIS

This section identifies the current role of the Airport and analyzes whether or not that role should change in the future. First, the current role assignment for the Airport within the national and state system of airports is described. Then, the Airport's role within the regional system of airports is examined in depth, including analysis of other airports in the region. Finally, the appropriate future role of the Airport is recommended.

Aurora State Airport's Role within the National System

The Airport is identified by the Federal Aviation Administration (FAA) as one of 2,564 General Aviation (GA) facilities nationwide and is included within the National Plan of Integrated Airport Systems (NPIAS). GA airports do not have scheduled passenger service. There are several criteria allowing an airport to be included in the NPIAS; however, the general criteria are that the airport has at least 10 based aircraft and is located at least 20 miles (30 minutes drive time) from another NPIAS airport. Aurora State Airport meets the based aircraft criteria; however, the Airport is within 13 miles (approximately 19 minutes drive time) of another NPIAS airport (Mulino State). This closer than 20-mile spacing of NPIAS airports is not unusual in urban areas where it is justified by the need for additional airport capacity.

Since it is in the NPIAS, the Airport is eligible to receive Federal grants under the Airport Improvement Program (AIP). Under the current AIP, federal grants cover up to 95% of GA airport eligible costs. Eligible costs include planning, development and noise compatibility projects. As part of receiving AIP grants, the ODA must accept all conditions and obligations under the FAA grant assurances. In general, such assurances require ODA to operate and maintain the Airport in a safe and serviceable condition, not grant exclusive rights, mitigate hazards to airspace, and use airport revenue properly.

Aurora State Airport's Role within the State of Oregon's System

The Oregon Aviation Plan 2007 (OAP 2007) classifies the Airport as a Category II, Urban General Aviation Airport. A Category II airport supports all general aviation aircraft and accommodates corporate aviation activity, including business jets and helicopters, and other general aviation activity. The primary users of these airports are personal and business related, and the airports serve a large geographic region. Key performance criteria associated with these airports are a FAA Airport Reference Code of C-II[1], minimum runway size of 5,000 feet by 100 feet, a precision instrument approach, and full service fixed base operations (FBOs).[2]

[1] Generally, this means the airport is designed to handle medium-sized business jets.
[2] A full-service FBO is a business that provides a wide range of services, such as fuel sales, aircraft repair and maintenance, hangar and tiedown rentals, aircraft charters and rentals, flight training, and amenities for pilots and passengers.

Aurora State Airport's Regional Role

The Airport is an important GA airport serving the Portland metropolitan area and the northern Willamette Valley. It has a convenient location with direct access to Interstate 5. Virtually all types of GA activity occur at the Airport, which is home to multiple businesses offering an array of aviation services. The Airport provides significant economic benefit to the region. The OAP 2007 reported 781 jobs at the Airport, and the total number of jobs attributed to the Airport is 2,469 when direct off-airport and "spin-off" (multiplier) effects are included. Annual wages for these jobs amount to $59,326,000. Annual business sales, aviation and non-aviation related, total $147,862,000.

Efforts to understand more about how the Airport is used and by whom included reviewing the Airport user survey responses, interviewing FBOs in the region, analyzing the geographic location of airport users, and evaluating airports with service areas that overlap the Airport's.

Airport Use According to User Survey and FBO Interviews

The recent Airport user survey shows the Airport is used mostly for business[3]. Over 55% of survey participants reported using the airport for business purposes. Other uses were recreational (41%), training (18%), emergency (4%), and other (14%). The other uses cited included personal transportation and inspection work for a telephone/broadband utility.

Forty-nine of 61 respondents indicated that they own or fly an aircraft and the other 12 respondents do not. About two-thirds of the aircraft used by respondents were small, single engine piston aircraft, such as the Cessna 172. The remainder included helicopters, multi-engine piston and turboprop aircraft, and business jets.

About one-fourth of survey respondents do not base their aircraft at Aurora State Airport. Their aircraft are based at airports within and outside of the region: Corvallis, Hubbard (Lenhardt Airpark), Troutdale, Medford, La Grande, Newburg (Sportsman Airpark), Sunset Airpark, Hillsboro (Stark's Twin Oak), Scappoose, San Jose (CA), Eugene, and Salem. Those who do not keep an aircraft at the Aurora State Airport indicated why they do not. Most cited inconvenient location (67%). Other reasons were the cost of a hangar (25%), lack of a suitable hangar (17%), and inadequate runway length (8%).

FBOs at surrounding airports were contacted to ask how they use the Aurora State Airport. Four FBOs responded, from Hillsboro Airport, McMinnville Municipal, Scappoose Industrial Airpark, and Troutdale Airport. Their use of the Aurora State Airport is limited to picking up or dropping off charter clients. The aircraft used for these operations range from Twin Commanders to a Gulfstream IV. They do not see the Airport as a reliever to Portland International now. The Airport might become a reliever if certain improvements were undertaken--runway lengthening and strengthening, increased hangar availability, auto parking, and improved instrumentation for poor weather operations. The possibility of reliever status will be discussed later in this chapter. When asked about the potential air traffic control tower,

[3] The Airport User Survey was not intended to be a statistical representation of airport users. Surveys were distributed through the project website, project meetings, and at local FBOs (Aurora State, Mulino State, Troutdale, McMinnville, Hillsboro and Scappose).

all reported the tower would be a good safety enhancement, but that their use of the Airport would likely remain unchanged. One FBO operator indicated their operations might decrease if there were a tower, since operations into and out of Aurora State Airport are efficient now, and having air traffic controllers sequencing aircraft would reduce this efficiency.

Analysis of Airport Service Area and Other Airports in the Service Area

To determine better who uses the Airport, the mailing addresses of aircraft owners who have used the airport for Instrument Flight Rules (IFR) arrivals and departures were analyzed. While more Visual Flight Rules (VFR) operations than IFR operations occur at the Airport, records of the aircraft performing VFR operations are not available. However, IFR data alone suffice to determine how far the Airport's service area extends. This is because IFR flight occurs more often in larger, higher performance aircraft than VFR flight.[4] Pilots who typically fly by VFR in small aircraft can choose among multiple airports with facilities and services adequate for their needs, and will often base their airplanes at the airport that is closest to home. Owners of higher performance turboprop and jet aircraft have fewer airports to choose from, since they need a longer/stronger runway, instrument approach, jet fuel, larger hangar, more security, and/or other features not every GA airport has.

For a two-year period, between October 2007 and October 2009, the Airport hosted 14,186 IFR operations, a combination of arrivals and departures (FlightAware). Aircraft based at Aurora and transient aircraft based at other airports performed these operations. The aircraft owners' addresses were unknown for 9% of the total operations. For the 12,848 operations with known aircraft owner addresses, the zip codes were analyzed.[5]

Of the owners of aircraft conducting IFR operations, 77% have addresses in Oregon, 8% in Washington, 4% in California, and 11% in 42 other states. Of the Oregon addresses, about one-third were outside the Portland-Salem region (Aurora State Airport was the trip destination). About two-thirds of the Oregon addresses were within a 30-mile radius of the Airport (Aurora State Airport was the trip origin). The addresses within 30 miles of the Airport were distributed as follows:

- 20% within 10 miles of Aurora:
  - 10% Aurora[6]
  - 5% Canby
  - 2% Tualatin
  - 3% Hubbard, Wilsonville, Woodburn, and Sherwood
- 39% between 10 and 20 miles from Aurora:
  - 17% Portland (south part)
  - 16% Lake Oswego
  - 2% West Linn

[4] Air taxi and corporate aircraft pilots usually fly IFR, due to regulatory requirements or company policy. In addition, the additional equipment and training expense for IFR flight is more often associated with more expensive, higher performance aircraft.
[5] Distances between zip codes were determined using xionetic.com.
[6] 2% of these aircraft are owned by Columbia Helicopters, which operates from facilities at Aurora State Airport, but their office in downtown Portland is listed as the aircraft owner's address.

  - 4% Beaverton, Molalla, Oregon City, Dayton, Dundee, Hillsboro (south part), Lafayette, Newberg, Milwaukie, Tigard, and Silverton
- 6% between 20 and 30 miles from Aurora:
  - 4% Portland (north part)
  - 2% Boring, Brightwood, Eagle Creek, Estacada, Fairview, Gresham, Sandy, Troutdale, Happy Valley, Hillsboro (north part), McMinnville, Salem

From this analysis, it appears that the Airport's core service area is within 20 miles (about 30 minutes driving time), but the service area extends up to 30 miles (about 45 minutes driving time). **Exhibit 1A** shows the area within 45 minutes driving time from the Airport, which represents the maximum extent of Aurora State Airport users. The airports within 45 minutes driving time from Aurora State Airport have service areas that overlap the Airport's service area. To help understand the regional role of Aurora State Airport, the characteristics of these "competing" airports were examined and compared to the Airport. The Airport's maximum service area covers portions of Clackamas, Marion, Multnomah, Washington, and Yamhill Counties, as well as Clark County in Washington and contains 46 airports.

Table 1A presents information about the 46 airports in order of vehicular drive time from the Airport. The information includes drive time and distance from the Airport, ownership and use, FAA and State status, numbers of based aircraft and aircraft operations, runway size, approach data, and the availability of fuel. Information sources were FAA Form 5010 Airport Master Records[7] and the OAP 2007.

[7] Found at: http://www.gcr1.com/5010Web/


Victoria
Seattle
WASHINGTON
Portland
OREGON
Boise City
Miles
0 200 400
N
W E
S
Battle Ground
Clark County
Mount Vista
Salmon Creek
Orchards
Vancouver
Pearson Field
Camas
Washougal
Portland International
Troutdale
Forest Park
Washington County
Sunset Air Strip
Olinger Airpark
Hillsboro
Forest Grove
Portland
Multnomah County
Gresham
Harvey's Acres
Aloha
Beaverton
Happy Valley
Krueger
Flying K
Bar J Ranch
Boring
Bruce's
Stark's Twin Oaks Airpark
Flying K Ranch
Tigard
Lake Oswego
Meyer Riverside Airpark
Ribbon Ridge
Sherwood
Oregon City
Eagle Nest Ranch
Fairways
Nielson
Warner's
Chahalem Airpark
Stan Jost
Aeroacres
Parson Landing
Beaver Oaks
Skyhill
Wilsonville
Newberg
Dundee
Sportsman Airpark
Yamhill County
Canby
Dietz Airpark
Clackamas Co
Lafayette Airstrip
Aurora State Airport
McGee
Compton
Mulino State
Workman Airpark
McMinnville
McMinnville
Marion County
Lenhardt Airpark
Woodburn
Skydive Oregon
Molalla
Sheridan
Yamhill County
Harchenko Industrial
Mount Angel
Hollin
Smith Private
Keizer
Silverton
Lusardi Field
Hayesville
Fly 'N' W
Blue Skies Farm
Salem
Iron Crown
Four Corners
Dallas
Salem McNary
Polk County
Monmouth
Wagoner
Flying E
Stayton
Exhibit 1A
Maximum Service Area Map
Service Area
(45-minute drivetime zone)
Miles
0 5 10 15 20
Map Compiled by:
WHPacific, Inc.
August 2010
WHPacific
Notes: Service area determined using Microsoft Streets and Trips "create drivetime zone" tool, saving a jpeg, georeferencing the jpeg using ESRI "Streets" layer, and digitizing the polygon.
Background Map Source: ESRI, "Streets," August 17, 2010, Copyright: 2009 ESRI, AND, TANA, UNEP_WCMC, http://www.arcgis.com/home/group.html?q=tags:ArcMap93_Base&t=group&owner=esri&title=ESRI%20Maps%20and%20Data&sortField=title&sortOrder=asc&content=all.
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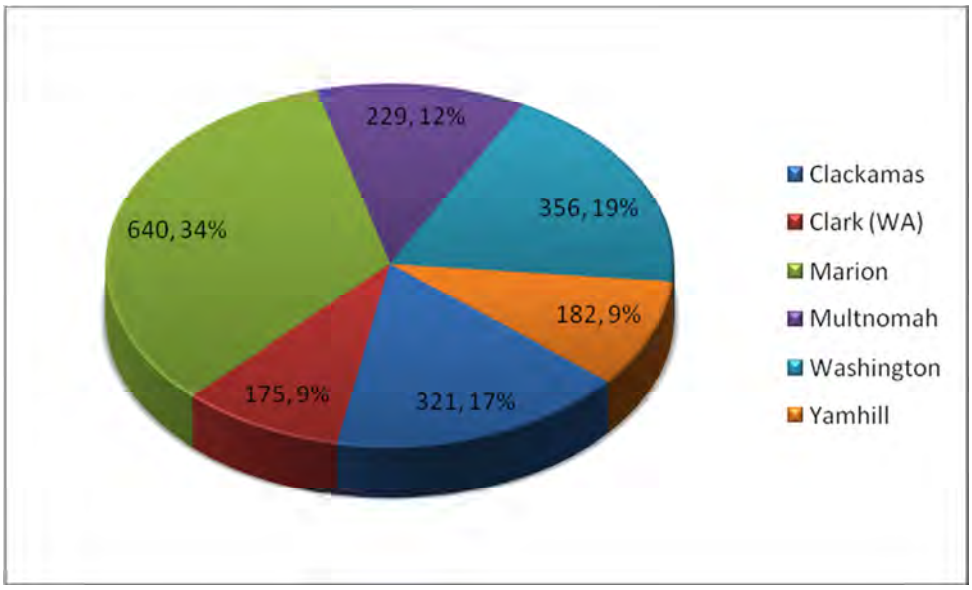
Table 1A. Information about Airports in the Region

AIRPORT NAME	ID	Drive Time	Distance & Direction	Ownership/ Use	NPIAS?	Oregon Cat.	Based Aircraft	Annual Ops	ARC	Rwy Type[8]	Rwy Length/Width	Rwy Alignment	Approach[9]	Fuel
Aurora State	UAO	0	0	State/Pub	Y	II	432	87,345	B-II	A	5004 x 100	17/35	Nonprec	Y
Compton	44OR	8	2.4 nm SE	Pvt/Pvt	N	-	3	0	-	T	2000 x 60	09/27	Visual	N
McGee	67OR	9	3.7 nm W	Pvt/Pvt	N	-	2	0	-	T	1960 x 90	16/34	Visual	N
Workman Airpark	OR41	10	4.9 nm SE	Pvt/Pvt	N	-	27	0	-	T	2240 x 100	07/25	Visual	N
Dietz Airpark	OR40	14	5.1 nm E	Pvt/Pvt	N	-	49	0	-	T	2640 x 60	16/34	Visual	N
Lenhardt Airpark	7S9	15	4.2 nm S	Pvt/Pub	N	IV	109	6,000	-	A	2956 x 45	02/20	Visual	Y
Meyer Riverside Airpark	OG34	18	9.5 nm N	Pvt/Pvt	N	-	4	0	-	T	1585 x 100	16/34	Visual	N
Mulino State	4S9	19	7.8 nm E	State/Pub	Y	IV	43	21,300	B-II	A	3425 x 100	14/32	Visual	Y
Flying K Ranch	OR00	20	12.2 nm N	Pvt/Pvt	N	-	4	0	-	T	1700 x 20	07/25	Visual	N
Sportsman Airpark	2S6	23	8.3 nm W	Pvt/Pub	Y	IV	51	11,650	-	A	2755 x 50	17/35	Visual	Y
Aeroacres	OG30	24	8.1 nm NE	Pvt/Pvt	N	-	3	0	-	T	1800 x 250	04/22	Visual	N
Harchenko Industrial	OR38	25	12.2 nm SW	Pvt/Pvt	N	-	6	0	-	A	2290 x 75	07/25	Visual	N
Fairways	OG20	27	10.2 nm NE	Pvt/Pvt	N	-	31	0	-	T	2900 x 160[10]	16/34	Visual	N
Nielson	2OR0	28	12.1 nm NE	Pvt/Pvt	N	-	4	0	-	T	1150 x 50	09/27	Visual	N
Harvey's Acres	OR28	28	12.8 nm NW	Pvt/Pvt	N	-	1	0	-	T	2100 x 100	E/W	Visual	N
Hollin	7OR7	30	13.0 nm SW	Pvt/Pvt	N	-	1	0	-	T	1750 x 80	16/34	Visual	N
Bruce's	07OR	31	12.2 nm NE	Pvt/Pvt	N	-	1	0	-	T	1200 x 100	17/35	Visual	N
Parson Landing	7OR9	31	13.4 nm E	Pvt/Pvt	N	-	1	0	-	T	1300 x 50	06/24	Visual	N
Skydive Oregon	OL05	31	8.8 nm SE	Pvt/Pvt	N	-	16	0	-	A	2900 x 32	18/36	Visual	N
Stark's Twin Oaks Airpark	7S3	31	13.1 nm NW	Pvt/Pub	N	V	108	22195	-	A	2465 x 48	02/20	Visual	Y
Stan Jost	74OR	31	11.5 nm NW	Pvt/Pvt	N	-	1	0	-	T	1300 x 80	15/33	Visual	N
Smith Private	29OR	32	15.2 nm SW	Pvt/Pvt	N	-	1	0	-	T	2500 x 70	16/34	Visual	N
Happy Valley	OL03	34	16.6 nm NE	Pvt/Pvt	N	-	2	0	-	A	2264 x 25	16/34	Visual	N
Lusardi Field	4OR7	34	17.4 nm SW	Pvt/Pvt	N	-	8	0	-	T	2200 x 60	17/35	Visual	N
Salem McNary	SLE	34	22.5 nm SW	Pub/Pub	Y	I	185	52,976	C-II	A	5811 x 150	13/31	Prec	Y
Chehalem Airpark	17S	34	12.8 nm W	Pvt/Pub	Y	IV	22	12,500	-	A	2285 x 40	07/25	Visual	N
Blue Skies Farm	OR87	35	18.1 nm S	Pvt/Pvt	N	-	1	0	-	T	1345 x 45	01/19	Visual	N
Skyhill	1OR7	37	13.5 nm E	Pvt/Pvt	N	-	1	0	-	T	2500 x 66	07/25	Visual	N
Fly 'N' W	4OR5	37	18.3 nm SW	Pvt/Pvt	N	-	2	0	-	T	1500 x 30	N/S	Visual	N
Hillsboro	HIO	37	19.2 nm NW	Pub/Pub	Y	II	213	253,847	C-III	A	6600 x 150[8]	12/30	Prec	Y
Krueger	OR72	38	22.2 nm NE	Pvt/Pvt	N	-	0	0	-	T	1300 x 150	16/34	Visual	N
Wagoner	4OR8	38	26.5 nm SW	Pvt/Pvt	N	-	1	0	-	T	1050 x 75	E/W	Visual	N
Ribbon Ridge	73OR	38	14.5 nm NW	Pvt/Pvt	N	-	1	0	-	T	1200 x 50	16/34	Visual	N
Pearson Field	VUO	40	22.9 nm N	Pub/Pub	Y	-	175	53,500	B-I	A	3275 x 60	08/26	Nonprec	Y
Lafayette Airstrip	OR90	40	15.2 nm W	Pvt/Pvt	N	-	3	0	-	T	2700 x 70	03/21	Visual	N
Portland International	PDX	41	21.7 nm N	Pub/Pub	Y	I	84	230,253	D-V	A	11000 x 150	10/28	Prec	Y
Sunset Air Strip	1OR3	41	23.0 nm NW	Pvt/Pvt	N	-	13	0	-	T	3050 x 200	06/24	Visual	N
Flying E	OR25	43	24.8 nm S	Pvt/Pvt	N	-	0	0	-	T	2300 x 45	09/27	Visual	N
Iron Crown	22OR	43	18.3 nm S	Pvt/Pvt	N	-	1	0	-	T	2000 x 50	16/34	Visual	N
Flying K Bar J Ranch	OR35	44	22.3 nm NE	Pvt/Pvt	N	-	1	0	-	T	1450 x 100	17/35	Visual	N
Warner's	20OR	44	15.3 nm E	Pvt/Pvt	N	-	2	0	-	T	2640 x 150	17/35	Visual	N
Eagle Nest Ranch	OR65	45	19.0 nm E	Pvt/Pvt	N	-	19	0	-	T	2500 x 80	12/30	Visual	N
Olinger Airpark	OR81	45	21.5 nm NW	Pvt/Pvt	N	-	13	0	-	T	2000 x 80	07/25	Visual	N
McMinnville	MMV	45	15.8 nm W	Pub/Pub	Y	II	104	63,500	D-II	A	5420 x 150	04/22	Prec	Y
Beaver Oaks	OR66	46	17.6 nm E	Pvt/Pvt	N	-	9	0	-	T	1700 x 75	15/33	Visual	N
Troutdale	TTD	47	23.9 nm NE	Pub/Pub	Y	II	145	105,020	B-II	A	5399 x 150	07/25	Nonprec	Y

[8] A= Asphalt, T= Turf
[9] Visual = Visual approach only, Nonprec = Nonprecision instrument approach, Prec = Precision instrument approach
[10] For airports with multiple runways, largest runway data shown.

The majority of the airports in the region are privately owned and limited to private use. The 46 studied airports host 1,903 based aircraft; 73% of the aircraft are at publicly owned, public-use airports, 15% are at privately owned, public-use airports, and the remaining 12% are at privately owned, private-use airports. Only 19 airports have at least ten based aircraft. **Figure 1A** highlights each county's share of the 1,903 aircraft based at the 46 airports.

Figure 1A. Distribution of Regional Based Aircraft by County



Runway lengths at the 46 airports vary between 1,050 feet and 11,000 feet. Only 32% of the runways are paved, and only 21% of the airports have aircraft fueling capability.

OAP 2007 assigned categories to 11 of the 46 airports. Aurora State Airport and three other airports (Troutdale, Hillsboro, and McMinnville) are Category II, Urban General Aviation. Both Salem McNary and Portland International Airports are Category I, Commercial Service, airports that offer scheduled commercial airline service. Lenhardt Airpark, Mulino State, Chehalem Airpark, and Sportsman Airpark are Category IV, Local General Aviation. Category IV airports primarily support single engine GA aircraft, but are capable of accommodating smaller multi-engine GA aircraft. Stark's Twin Oaks is the only Category V airport; its primary role is to support single engine GA aircraft and provide access to remote areas or emergency service.

Few of the airports have a designated Airport Reference Code (ARC). An ARC represents an FAA-defined class of aircraft. The FAA uses ARCs to customize airport design standards for the most demanding aircraft that can use an airport. An ARC consists of a letter and a Roman numeral. The letter is the Aircraft Approach Category, determined by aircraft approach speed. The Roman numeral is the Airplane Design Group, determined by wingspan or tail height, whichever is more demanding. Below is a table that further explains the ARC components.

Aircraft Approach Category (Approach Speed)		Airplane Design Group (Wingspan / Tail Height)	
A	< 91 knots	I	< 49' / < 20'
B	91-121 knots	II	49'-79' / 20'-30'
C	121-141 knots	III	79'-118' / 30'-45'
D	141-166 knots	IV	118'-171' / 45'-60'
E	> 166 knots	V	171'-214' / 60'-66'

According to the 2000 Master Plan, the ARC for Aurora State Airport is B-II. Other B-II airports are Mulino State and Troutdale. Pearson Field's ARC is B-I. The ARCs for Salem McNary and Hillsboro are C-II and C-III, respectively. Portland International's ARC is D-V, and McMinnville Municipal's is D-II. The ARCs for the other 38 airports are not designated, but a review of the based aircraft fleet mix and runway dimensions indicates they would likely not accommodate or meet FAA standards for aircraft larger or faster than ARC B-I. Most single and twin-engine piston Beechcraft, Cessna and Piper aircraft are in ARC A-I or ARC B-I.

Seven of the airports have instrument approaches. At the other 39 airports, aircraft can only land when the weather is clear. Global Positioning System (GPS)-aided instrument approach procedures have been available for about 15 years. Since GPS approaches do not require costly ground-based equipment, such as required by traditional instrument approaches, the number of GA airports changing from visual to GPS-aided instrument runways has been growing nationwide. GPS navigation is becoming standard in GA aircraft, although most GA pilots still fly by VFR in visual meteorological conditions. Most business and corporate operators fly under IFR regardless of weather conditions, so they typically base their operations at airports with instrument approaches.

Only ten, or 22%, of the airports are eligible for federal funding due to their inclusion in the NPIAS. The other airports must rely solely on private funding. While there are many airports within the region, few have stable funding for planning and capital development. Facilities like Aurora State Airport play an important function within the region because they have viable, renewable sources of funding.

Supplemental information was gathered for the 19 largest airports--those with at least ten based aircraft. A description of these airports follows; each description provides, where possible, the following:

- The county in which the airport is located
- Total acres
- Accessibility by automobile
- Fuel services
- Instrument approaches
- Expansion potential

- Future development plans
- Hangar availability, rates, and fees
- Any other requirements

Accessibility was rated "good" if the airport is a short distance from an interstate or major highway. This information was acquired from available data on the ODA website, FAA Form 5010, and airport owner/manager interviews.

Aurora State Airport. Aurora State is located in Marion County and encompasses 144 acres (state-owned land only). It is easily accessible from Interstate 5, which runs north-south through the Willamette Valley. Aircraft maintenance, fuel services (Avgas and Jet Fuel) and flight training are among the many services offered at the Airport's three FBOs. Weather information is available from an Automated Surface Observing System (ASOS) and the Airport has GPS, instrument landing system localizer (ILS-LOC), and very high frequency omnidirectional range (VOR) approaches. The 2000 Master Plan states the ARC is B-II, indicating the most demanding aircraft with at least 500 annual itinerant operations is a Cessna Citation II or similar aircraft. Currently, there are 432 based aircraft at Aurora State. (More information on existing facilities follows in Chapter 2, *Inventory*.)

Workman Airpark Airport. Workman is a residential airpark located in Clackamas County, with 27 based aircraft. No services are available to the public. There are no plans to expand the airport or the number of hangars/homes located there. The FAA Form 5010 did not report acreage.

Dietz Airpark Airport. Dietz is a residential airpark located in Clackamas County, with good access to the Portland metro area. There are 49 aircraft based at the airport; in 2007, it was reported to have only 32 based aircraft. The FAA Form 5010 did not report acreage. There are no services available to the public.

Lenhardt Airpark Airport. Lenhardt Airpark is situated on approximately 30 acres within Clackamas County. Avgas is available for its 109 based aircraft and transient users. There is reportedly room to build additional hangars if needed.

Mulino State Airport. Mulino State is located in Clackamas County near Highway 213, and is owned and operated by ODA. Until recently, it was owned and operated by the Port of Portland. Access to the Portland metro area and Interstate 205 is good; however, direct access to Interstate 5 is poor. The airport is approximately 275 acres, with 43 based aircraft. New hangars have been constructed recently, and land is available for more hangar development. Self-service fuel is available. Mulino does not have an instrument approach.

Sportsman Airpark Airport. Sportsman Airpark is located in Yamhill County on approximately 60 acres, with good access to the Portland metro area. There are 51 based aircraft. Both Avgas and Jet Fuel are available. Land is available for hangar development and aviation-related businesses on the eastern portion of the airport.

Fairways Airport. Situated on approximately 40 acres within Clackamas County, Fairways supports 31 based aircraft. Reports have indicated this airport may be at risk of closure; however, the airport owner was not available to ask about future plans.

Skydive Oregon Airport. Skydive Oregon is located near Molalla in Clackamas County, with good access to the Portland metro area. The airport occupies approximately 42 acres. Available records show there are no services offered for the 16 based aircraft. Future plans for the airport are unknown. Aerial photography indicates there may be room for additional hangars.

Stark's Twin Oaks Airpark Airport. Stark's Twin Oaks Airpark is situated on approximately 65 acres in Washington County and has 108 based aircraft. There is good access to the Portland metro area. Avgas and maintenance services are available at this airport.

Salem McNary Field. McNary Field offers commercial airline service and is located in Marion County on 751 acres. It has 185 based aircraft, most of which are single engine. There is some development potential on the airport's south end. Records show the majority of operations are local and itinerant GA. Military aircraft accounted for nearly 4,000 operations in 2009. Access to Interstate 5 is excellent. The airport provides fuel and a variety of services. It also has precision and nonprecision instrument approaches.

Chehalem Airpark. Located in Yamhill County, Chehalem Airpark encompasses 28 acres. There are 22 based aircraft at the airport. It offers a wide range of aviation-related services such as Avgas, maintenance, aircraft rental, and charter services. It is privately-owned, but open to the public. Aerial photography indicates land is available for development.

Hillsboro Airport. The Port of Portland owns and operates the 900-acre Hillsboro Airport. The airport provides many services, such as fuel (Avgas and Jet Fuel), aircraft maintenance, flight instruction, and aircraft rental. It currently has 213 based aircraft. The airport is a designated reliever for Portland International and is experiencing a growing volume of corporate air traffic. The Airport Master Plan (2005, June) shows the Hillsboro Airport's ARC is C-III, meaning the most demanding aircraft using the airport would be a Gulfstream jet or similar. Both precision and nonprecision approaches (ILS, LOC, VOR/distance measuring equipment (DME), and NDB) are available to pilots, as well as an air traffic control tower. Access to the Portland metro area is very good along Highway 26.

Pearson Field. Pearson is the only airport within Aurora State Airport's maximum service area located outside of Oregon. It is located in Clark County, Washington, on approximately 104 acres, 73 of which are owned by the National Park Service and within the Vancouver National Historic Reserve. The airport is rich in aviation history and offers a variety of services. It has 150 GA hangars and a waiting list for those who want to hangar their airplane there. Records indicate 175 based aircraft.

Portland International Airport. Portland International Airport (PDX) is located in Multnomah County with excellent access to Interstate 5, Interstate 84, and Interstate 205. Owned and operated by the Port of Portland, it is the largest commercial service airport in Oregon. It occupies approximately

3,200 acres and in its immediate surroundings accommodates a variety of industrial and commercial uses. It hosts some GA activity and has 84 based aircraft, but focuses on airline service. The Port of Portland owns two reliever airports (Hillsboro and Troutdale) to "relieve" PDX of GA aircraft operations and maximize PDX's capacity for airline operations.

Sunset Air Strip. Sunset Air Strip is located on 14 acres in Washington County, just off Highway 26. It has 13 based aircraft. No services are available. It is a residential airpark, mostly surrounded by agricultural lands.

Eagle Nest Ranch. Eagle Nest Ranch is located in Clackamas County. Its acreage is unknown. It is a residential airstrip that appears to have recently expanded. In 2007, FAA records indicate it had 2 based aircraft; however, more recent data shows 19. Aerial photography indicates land is available for development.

Olinger Airpark. Olinger Airpark is a residential airstrip in Washington County with 13 based aircraft. There are no services available at this privately owned, private-use airport. Area for expansion is limited, based on aerial photography.

McMinnville Municipal. Located in Yamhill County, McMinnville has 104 based aircraft on 650 acres. Full services are available at this GA airport. It has both precision and nonprecision instrument approaches. Land is available for developing additional hangars. It is the home of Evergreen Aviation, which is the likely explanation for the ARC of D-II.

Troutdale Airport. Troutdale Airport encompasses 284 acres and is located in Multnomah County. It is owned and operated by the Port of Portland and is home to 145 based aircraft. It is a reliever for Portland International and attracts business and recreational GA traffic. Various services are offered for pilots, including fuel (Avgas and Jet Fuel), maintenance, aircraft rental, and flight instruction. The airport has an air traffic control tower and GPS and non-directional radio beacon (NDB) instrument approaches. The airport's Master Plan Update (2004, October) reports the ARC is B-II. The airport is located 10 miles east of PDX and has excellent access to Interstate 84.

Airport Role Conclusions and Recommendations

Aurora State Airport fits well the OAP 2007 description of an Urban General Aviation Airport. It is one of five GA airports in the region with facilities and services appropriate for business jets. The five airports are Aurora State, Hillsboro, McMinnville, McNary Field in Salem, and Troutdale. These airports are appropriately spaced to provide good accessibility to the population and businesses in the region without substantial service area overlap that might undermine the long-term viability of any of the airports.

Alternatives to continuing Aurora State Airport's Urban General Aviation role are undesirable:

- Downsizing the Airport's capability—attempting to limit it to smaller piston-powered, airplanes and recreational use--is an impractical future for the Airport. ODA would be violating grant

assurances made to the FAA, the regional airport system would have a hole that would be costly and difficult to fill, and residents and businesses in the region would suffer economically.

- Commercial service is also not an appropriate future role for Aurora State Airport. Portland International Airport has the capacity to handle commercial passenger and cargo airline activity in the region for many years to come. If commercial service grows elsewhere in the region, it will likely be at Salem, which is more suitable for commuter airline service.

The Airport has grown at a faster rate than past planning efforts expected. It has become popular for both personal and business GA use. The growth in business use is likely due to the Airport's location with access to Interstate 5, along with aggressive private development adjacent to the state-owned airport property. Considering prior investment in the Airport, its large and growing number of based aircraft, its eligibility for FAA funding, and its proven record for attracting private funding for landside facilities, it appears likely that Aurora State will remain a viable GA airport long into the future. Business aviation will probably grow more than personal and recreational aviation, but the Airport's role in the future should not change from its current role—a busy airport handling a full range of GA, including helicopters and business jets.

As business aviation and higher performance aircraft traffic grows, some owners of smaller, personal use and recreational aircraft may want to relocate to a less busy airport where the other aircraft are smaller and slower. ODA now owns Mulino State Airport, which is a short distance from Aurora State Airport. Mulino is well suited to single engine and small multi-engine piston aircraft and VFR flying. It has hangars available and sufficient land for building many more hangars should minor infrastructure constraints be addressed. If Aurora State Airport becomes overutilized and Mulino State Airport remains underutilized, ODA may be able to structure its rates and charges to achieve maximize utilization of both airports' capacities.

Aurora State Airport is not an FAA-designated reliever airport for Portland International, although it is often referred to as one. The Airport could be officially designated a reliever in the short-term future, if ODA decides to pursue the designation and the FAA agrees. However, the advantages the reliever designation once held--more AIP entitlement funding and higher priority for discretionary AIP funding--have disappeared in recent years.

FAA Order 5090.3C, *Field Formulation of the National Plan of Integrated Airports Systems (NPIAS),* explains the requirements for reliever designation. An existing public-use airport may be included in the NPIAS as a reliever airport if it substantially relieves airport congestion at a commercial service airport and provides GA access to the surrounding area. Although reliever airports are designated by thorough case-by-case reviews, general requirements are:

- A current activity level of at least 100 based aircraft or 25,000 annual itinerant operations
- An airport must have a forecasted activity level of at least 100 based aircraft or 25,000 annual itinerant operations for the period in which it is being designated as a reliever.
- The relieved airport (in this case, Portland International (PDX)):

- is a commercial service airport that serves a metropolitan area (MA) with a population of at least 250,000 persons or at least 250,000 annual enplaned passengers, and
- operates at 60% of its capacity, or would be operated at such a level before being relieved by one or more reliever airports, or is subject to restrictions that limit activity that would otherwise reach 60% of capacity.

Aurora State Airport meets the first two criteria on current activity levels. The relieved airport (PDX) also meets the first of two criteria. The 2010 Master Plan for PDX reports the FAA has set the airport's capacity upper limit at 500,000 annual operations. By 2035, PDX is forecasted to have 377,820 operations. This means that by 2035, PDX will be operating at 76% of its capacity.

PDX would be operating at 60% of its capacity now if Aurora State Airport did not exist and the operations that now occur at Aurora State were added to PDX operations. Using averages for the years 1998 through 2008 from the FAA's Terminal Area Forecast, PDX has 284,580 annual operations and Aurora State Airport has 79,953 operations.[11] Adding Aurora's operations to PDX's operations results in a total of 364,533 operations, or 73% of PDX capacity. These figures meet the last criteria needed for a proposed reliever airport.

However, the PDX Airport Layout Plan includes the addition of a third runway that would greatly increase PDX's capacity, thereby decreasing the demand/capacity utilization to less than 60%.

It is recommended that Aurora State Airport continue to fulfill its role as an Urban General Aviation Airport. The advantages and disadvantages of becoming a reliever airport should be discussed with the ODA, Port of Portland, and FAA.

[11] Eleven-year averages are used to reduce the effect of annual fluctuations. These annual numbers do not match any one specific year because they are averages.

Chapter Two: INVENTORY

Airport Master Plan Update

Aurora State Airport

An initial step in the preparation of this Master Plan (Plan) is to collect data pertaining to the Aurora State Airport (Airport) and the area it serves. An inventory of the Airport was accomplished through physical observation of existing facilities, interviews with Airport users and business owners, Oregon Department of Aviation (ODA) staff, and a review of previous Airport studies and records.

This chapter summarizes the Airport's background, existing airfield and landside facilities, airspace, land use and zoning, environmental issues, and historical aviation activity and financial data. The information gathered as part of this initial step is the foundation for various analyses completed in the subsequent chapters of this Plan. An accurate inventory helps produce an aviation demand forecast that is reasonable and aids in identifying future facility development needs.

BACKGROUND DATA

Airport Location and Access

The Airport is situated in the heart of the Willamette Valley in Marion County, Oregon and is adjacent to Clackamas County to the north. It is located on the southern extents of the Portland metropolitan area, but resides within the Salem Metropolitan Statistical Area – as it is mid-way between Portland and Salem. The city of Aurora is located approximately one-quarter mile southeast of the Airport. **Exhibit 2A** shows a map of the region and Airport vicinity.

The majority of the County is rural and has abundant agricultural lands, making it the largest producer of agricultural products in the state of Oregon. The County's economy is also heavily dependent on government, as the state's capital is located within its boundaries.

The Airport is conveniently located adjacent to Interstate 5, which is an essential commerce link for the western United States. Access to the Airport is also provided by Highway 551 (Canby-Hubbard Highway) from the north and south, Arndt Road from the east and west, and Airport Road from Aurora. Keil Road is located south of the Airport and provides additional airport business access from Highway 551 and Airport Road.

Other transportation modes are available near the Airport. Canby Area Transit offers public transportation, with a bus stop on Main Street in Aurora. Taxi service is also available in Aurora. Amtrak train and Greyhound bus services are available in Portland.

Area Topography

A mostly rural county, Marion encompasses agricultural and recreational lands (*i.e.*, Ankeny National Wildlife Refuge, Mount Hood National Forest and Willamette National Forest). Marion County is in the central area of the Willamette River Basin, which is surrounded by the Cascade Range to the east, the Coast Range to the west, the Calapooya Mountains to the south and the Columbia River to the north. Generally speaking, the area is level with rolling hills. The Airport's elevation is 200 feet above mean sea level (MSL).

Climate

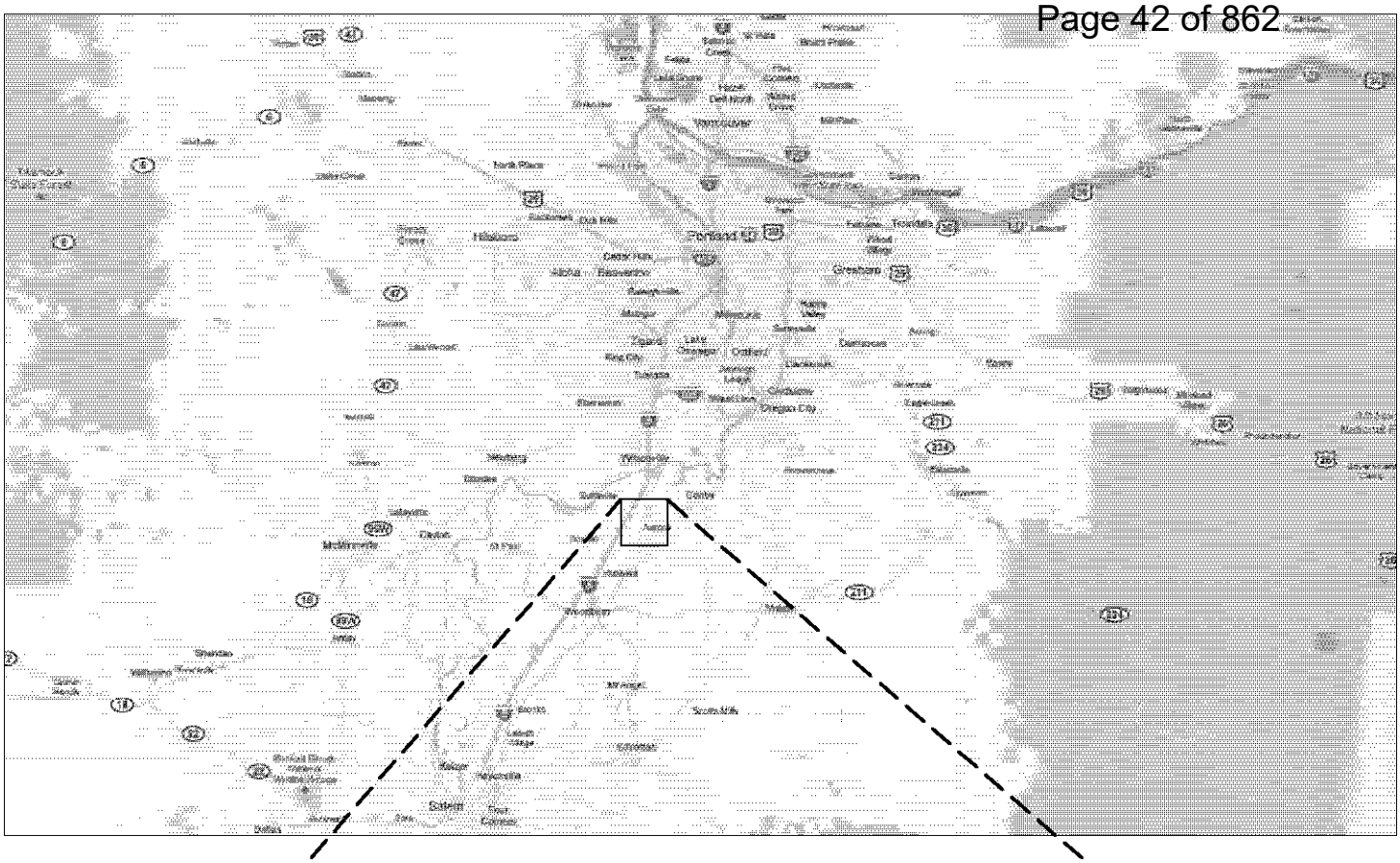
The Aurora area has mild, wet winters, and warm, dry summers. Winter temperatures generally range from 45 to 55 degrees Fahrenheit, and summer temperatures generally range from 70 to 80 degrees Fahrenheit. Annual rainfall averages 40.7 inches, with the majority of it occurring from November through March. Annual snowfall averages two inches per year. The mean maximum temperature in the hottest month (August) is 84 degrees.

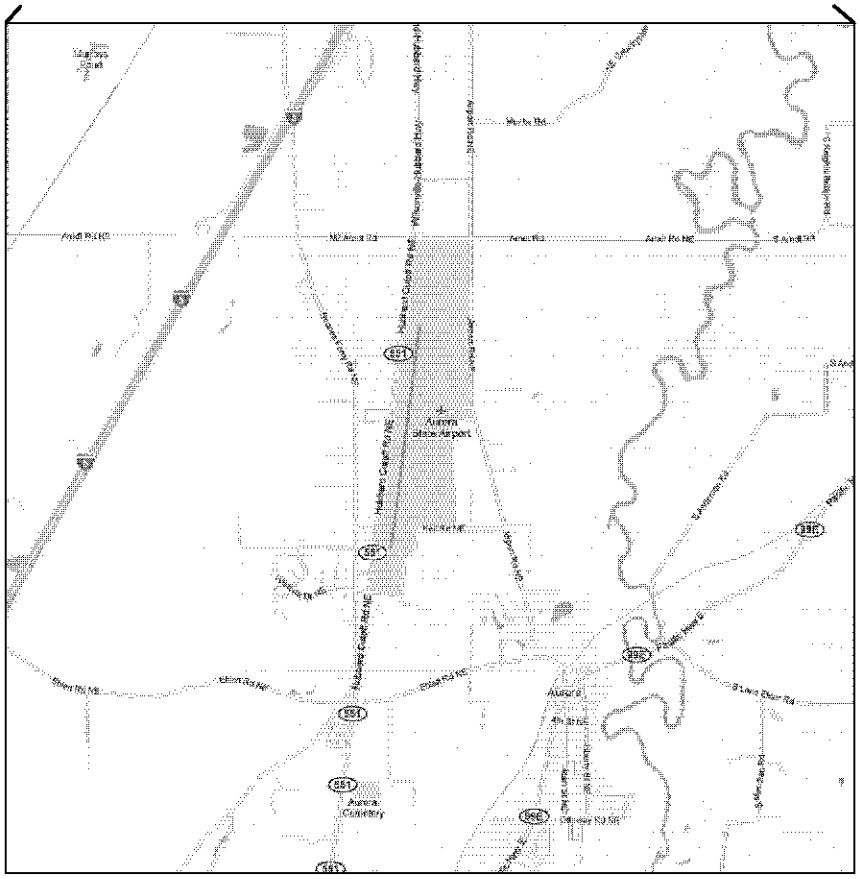
Community and Airport History

Dr. William Keil founded the Aurora Colony in 1856. The colony disbanded in 1883, but the community persisted due to the people's craftsmanship, and because of the stage and rail stop bringing visitors to the town's hotel. Today Aurora is recognized as a national historic district and is known for its numerous antique dealers. According to Census records, the population of Aurora in 2009 was 1,020.

The Airport was established in 1943 and was managed by the United States Bureau of Public Roads until 1953. The State of Oregon has operated the Airport since 1953, although ownership of the land was not actually transferred from the Highways Division to the Aeronautics Division (ODA's predecessor) until 1973.

The first Airport Master Plan was prepared in 1976, followed by major improvements in 1977-78, which included construction of a parallel taxiway, installation of a rotating beacon, runway reconstruction and narrowing (to 100 feet), drainage improvements, runway lighting, and tiedown apron construction. The 1976 Plan identified the need for an air traffic control tower. In 1979, a 22-acre parcel near midfield was purchased with Federal Aviation Administration (FAA) funds, which has since been leased to private parties who constructed aircraft hangars and other facilities on the property. In 1986, another 10 acres with a small tiedown apron was purchased near midfield. A second Airport Master Plan for the Airport was completed in 1988. In 1995, the runway was lengthened from 4,104 feet to 5,004 feet and a non-precision Localizer Landing System instrument approach was added to Runway 17. In 2004, the runway was reconstructed and in 2009, the parallel taxiway was relocated to meet FAA's design standard for runway-taxiway centerline separation.





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Exhibit 2A ~ Location & Vicinity Map

August 20, 2010

Aurora State Airport

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A unique public-private partnership has developed over the years at the Airport. The State's property is almost exclusively dedicated to airfield facilities (runway, taxiway, tiedown aprons, etc.), while the majority of tenants are located on adjacent private lands and access the Airport via through-the-fence agreements. This Plan will reference both "Airport Property" and "Airport Environs". Airport Property refers to the State's property owned in fee. Airport Environs encompasses the property used for airport-related activities, and includes public and privately owned property. The actual Airport fence encompasses the Airport Environs for safety and security purposes. The term through-the-fence is an FAA term used to describe aircraft accessing a public airfield from private land, and does not involve actual fences.

EXISTING FACILITIES

Existing facilities at the Airport are divided into three categories: airfield, landside, and support facilities. Airfield facilities include areas such as runways, taxiways, and aprons. Landside facilities include areas such as hangars, airport buildings, and auto parking. Support facilities include emergency services, utilities, and miscellaneous facilities that do not logically fall into either airfield or landside facilities. **Exhibit 2B** shows the existing facilities at the Airport.

Airfield Facilities

Airfield facilities include pavements used for the movement of aircraft (*i.e.*, runways, taxiways, taxilanes, aprons). In April 2008, as part of a three-year rotation, the Airport's Pavement Condition Index (PCI) was updated for those pavements located on Airport Property. The condition of the airport pavements were rated on a scale of 0-100 with 0 being an unusable paved surface and 100 reflecting a just-constructed paved surface. Generally, ratings with a PCI above 70 require only preventative maintenance in the short term, while ratings between 40 and 70 require major rehabilitation and ratings less than 40 typically require reconstruction. **Exhibit 2C** depicts the pavement condition map for the Airport. The exhibit does not show the recent Taxiway A relocation since the pavement survey was done before the taxiway project. At the time the PCI was updated, pavement sections were documented. Pavement sections describe how individual sections of pavement were constructed. In general, most pavements at the Airport consist of four inches of asphalt on top of 6-13 inches of a crushed aggregate base. **Exhibit 2D** provides a detailed graphic of the existing pavement sections at the Airport.

Runway. The Airport has one paved runway, 17/35, with the dimensions of 5,004 feet by 100 feet. The runway pavement surface is asphalt and in April 2008 was given a PCI rating of excellent. The pavement strength of the runway is rated as 30,000 pounds for Single Wheel Gear (SWG)[1] aircraft and

[1] Single Wheel Gear is the term used to describe aircraft with one wheel per strut, while Dual Wheel Gear is for aircraft with more than one wheel per strut. An aircraft's landing gear configuration and gross weight are critical components in airfield pavement design and are used to characterize pavement strength.

45,000 pounds for Dual Wheel Gear (DWG). A 150-foot blast pad is located at the Runway 35 end. The runway supports general aviation, which include private and business operators but does not include commercial (airline) operators.

Taxiways and Taxilanes. Taxiways are constructed primarily to facilitate aircraft movements to and from the runway. Some taxiways are necessary simply to provide access between aprons and the runway, and other taxiways are necessary to provide safe and efficient use of the airfield.

Runway 17/35 has a full-length parallel taxiway (Taxiway A) that is 35 feet wide. Five taxiways connect Taxiway A to Runway 17-35; Taxiway A1 is located at the Runway 17 end, and A5 is located at the Runway 35 end.

From Taxiway A, ten taxilanes lead to aircraft parking, hangars, and airport businesses. Additional taxilanes are located between hangar buildings. Taxiways and taxilanes are constructed of asphalt and have PCI ratings between 70 and 100, which is representative of pavements in very good to excellent condition. Pavement condition was not rated for taxilanes on private property)

Aprons and Aircraft Parking. On state-owned property, there are 46 designated tiedown positions. On privately owned property, there are 37 designated tiedown positions with additional aprons for large aircraft parking. The 2000 Master Plan reported 180 tiedown positions; many of these were removed because of hangar construction and the taxiway relocation project. Additionally, there are two helipads on private property and a commercial helicopter operation area for Columbia Helicopters at the northeast end of the Airport.

Airfield Lighting. Airfield edge lighting systems are categorized as low, medium, or high intensity. The color of the lights is also important as it indicates to pilots where they are in the airport environment. For example, runway edge lights are white and taxiway edge lights are blue.

At the Airport, the lighting system is a medium intensity system, which is pilot controlled by keying the microphone inside of the aircraft. Edge lighting is located on the runway and parallel taxiways, while the apron and hangar taxilanes are lined with edge reflectors.

Airport Navigational Aids. Airport Navigational Aids, or NAVAIDS, provide navigational assistance to aircraft for approaches to an airport. NAVAIDS are classified as visual approach aids or instrument approach aids; the former providing a visual navigational tool and the latter being an instrument-based navigational tool. The types of approaches available at an airport are based on the NAVAIDS provided. The following sections describe existing NAVAIDS at the Airport.

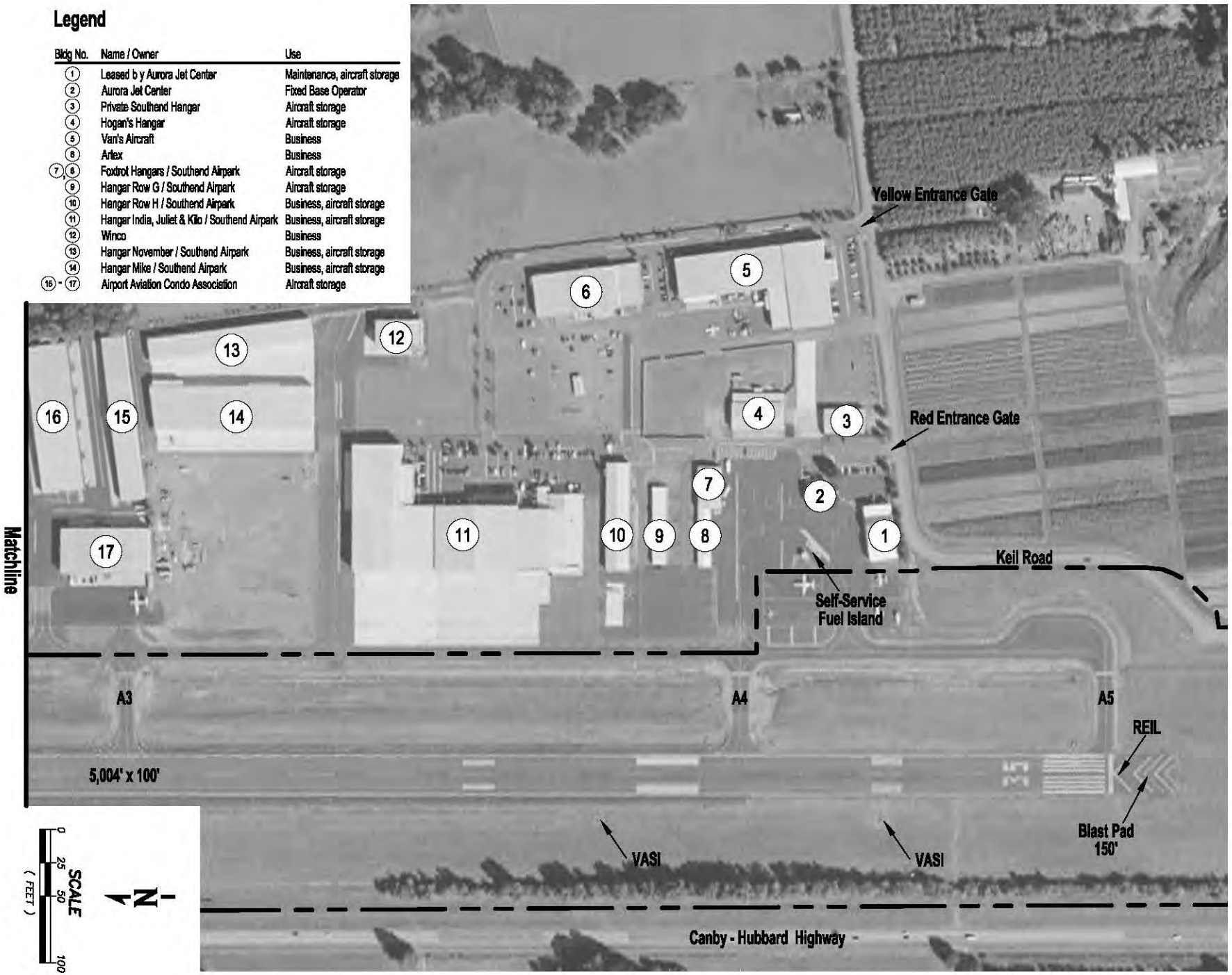
Visual Approach Aids. The Airport has three forms of visual approach aids. A two-box Visual Approach Slope Indicator (VASI) is located at each runway end. VASIs give glide slope information to pilots on final approach by displaying sequences of different colored lights to maintain a safe glide slope for landing. Runway 17 has both an Omnidirectional Approach Lighting System (ODAL) and Runway End Identification Lights (REILs). The ODAL lighting system – typically associated with runways with instrument approach procedures – consists of a series of strobe lights that extends outward from the

Exhibit 2B ~ Existing Airport Facilities

Aurora State Airport

Aurora, OR

Sept 16, 2010



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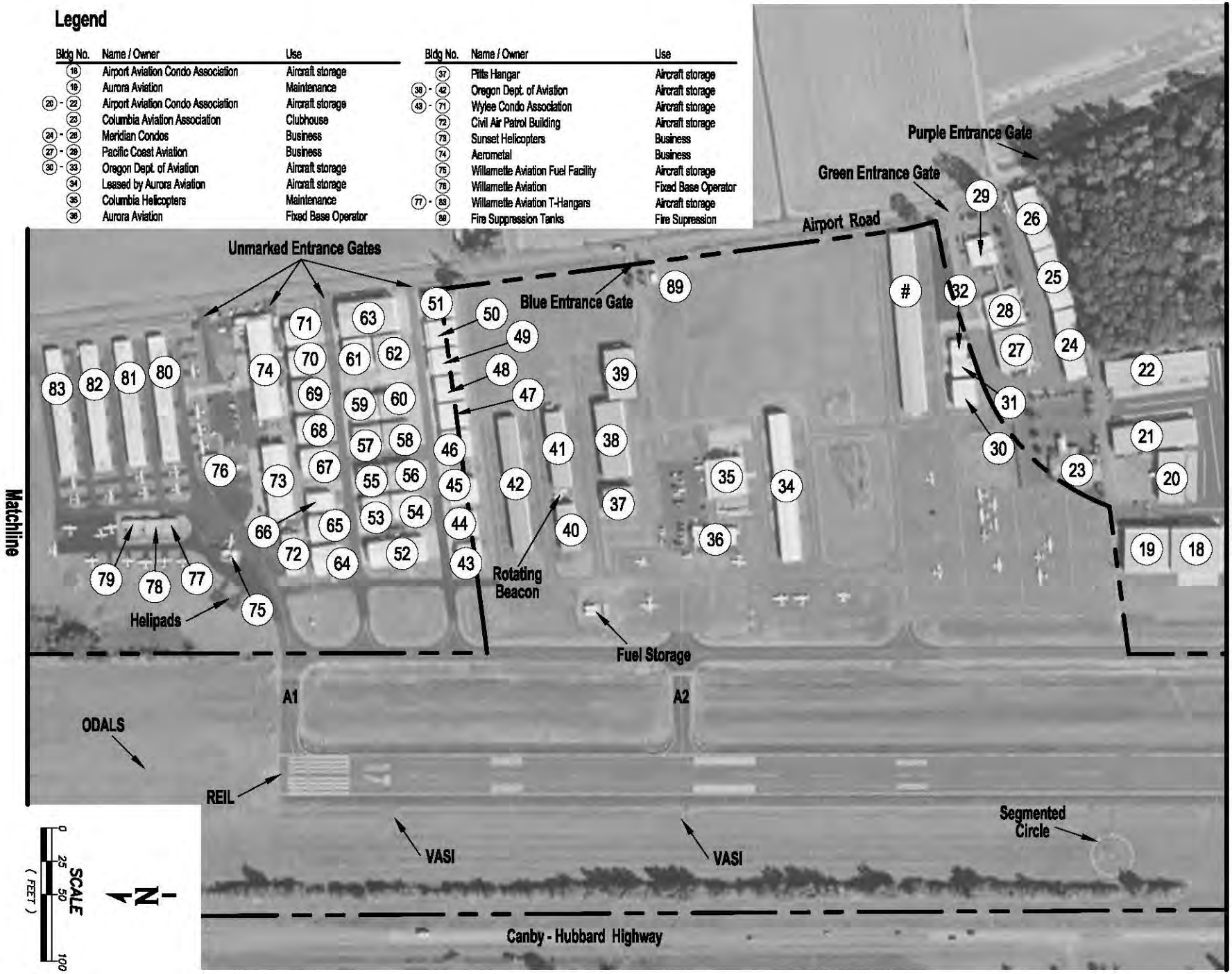
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Exhibit 2B ~ Existing Airport Facilities

Aurora State Airport

Aurora, OR

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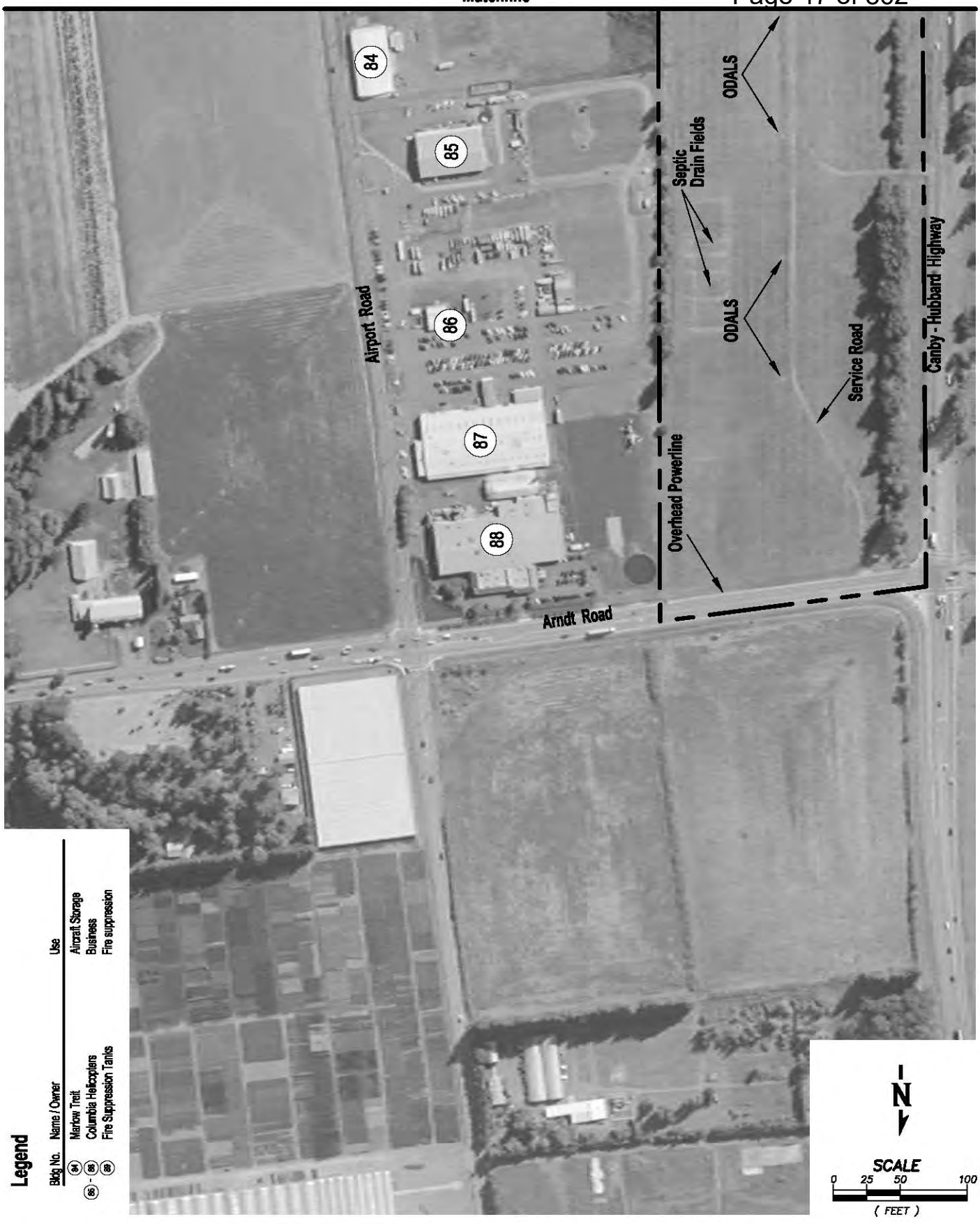


Exhibit 2B ~ Existing Airport Facilities

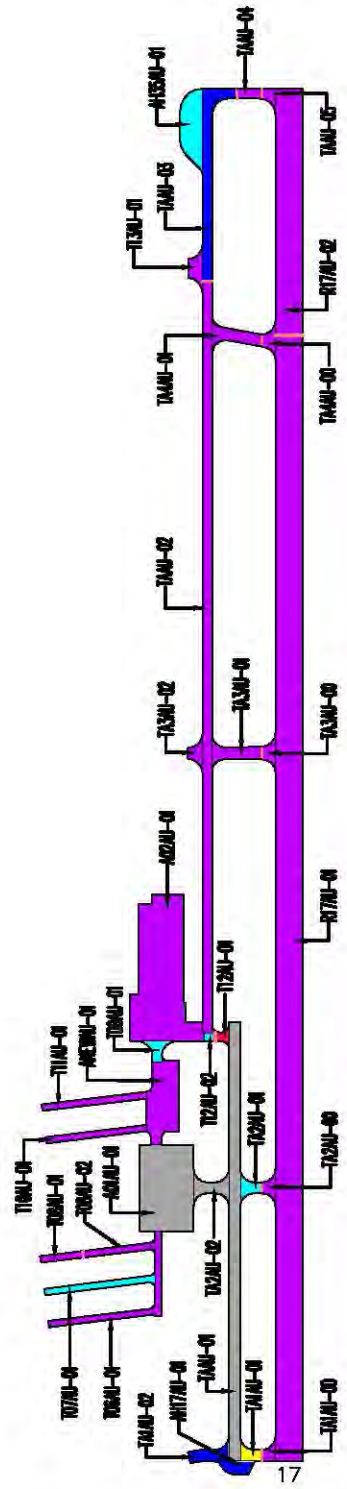
Aurora State Airport

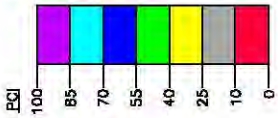
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Figure AU-3. Pavement Condition in April 2008.
Aurora State Airport

Drawing Date: April 2008

Exhibit 2C ~ Pavement Condition Map

Aurora State Airport

Aurora, OR

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Exhibit 2D ~ Pavement Section Map

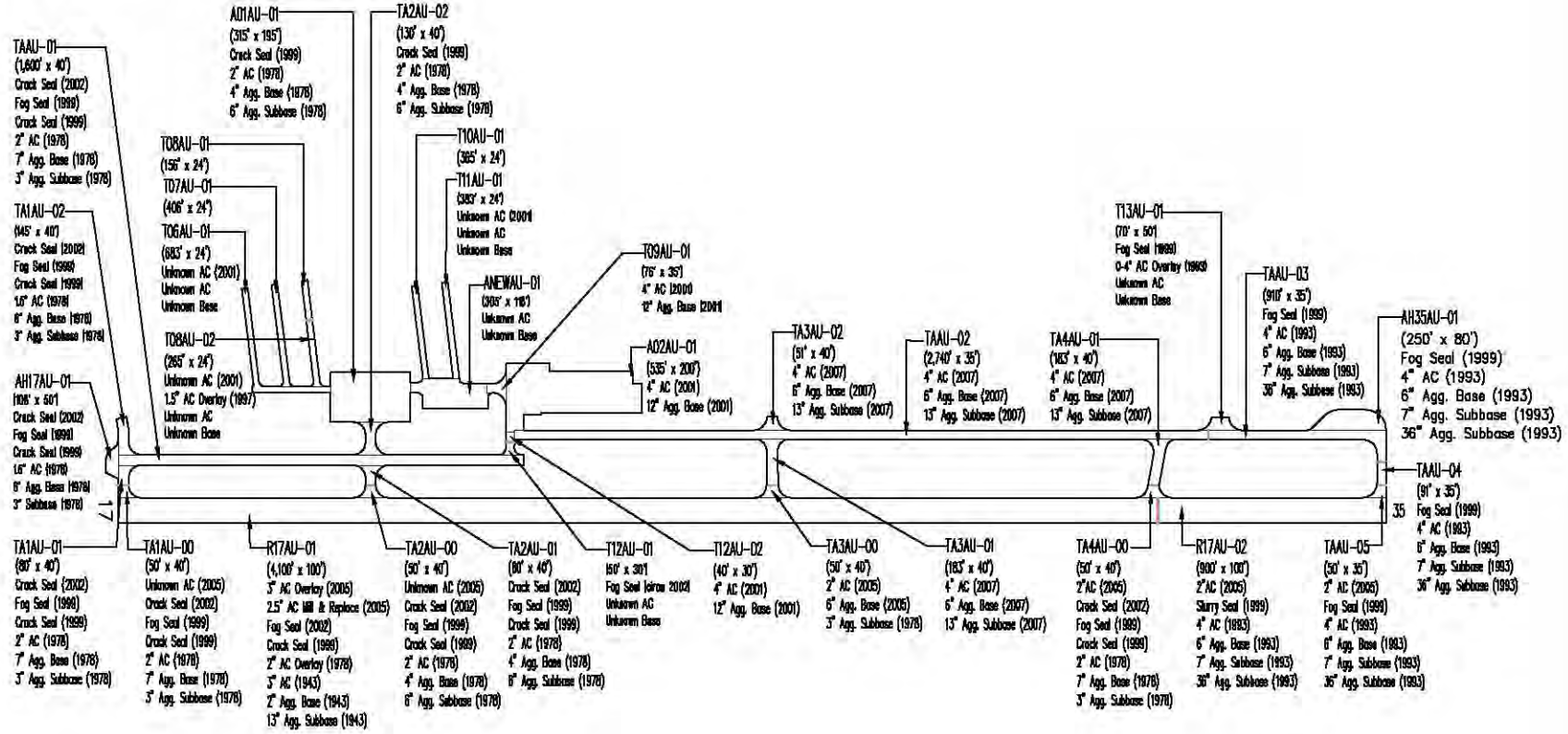
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Figure AU-1. Airport Layout, Dimensions and Pavement Cross-Sections.
Aurora State Airport



Drawing Date: April 2008

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runway end and allows pilots to visually identify the runway environment. REILs are located at the Runway 17 threshold to provide rapid and positive identification of the runway end.

Instrument Approach Aids. Both Runway 17 and 35 have instrument approach procedures, which can be used when the visibility and cloud ceiling are below minimums for Visual Flight Rules (VFR) conditions. **Table 2A** details the approaches available at the Airport.

Additionally, the HELNS FOUR Standard Terminal Arrival (STAR) is available for pilots arriving at the Airport. A STAR is a published procedure followed by aircraft on an Instrument Flight Rules (IFR) flight plan just before reaching the Airport. Special departure procedures apply for aircraft departing the Airport during instrument conditions, as well.

Table 2A. Instrument Approaches and Approach Minima

Approach Name[2]	Runway End Serviced	Approach Minimums	
		Ceiling (feet)	Visibility (statute miles)
RNAV (GPS)	17	400	1 ¼
	35	500	1
RNAV (GPS)-B	17 and 35	500	1
LOC	17	400	1
VOR/DME-A	17 and 35	500	1

Other NAVAIDS. There is a lighted wind cone and segmented circle located west of the runway at the midfield point. A rotating beacon is located east of the runway between buildings 40 and 41, as shown on Exhibit 2B. An Automated Surface Observing System (ASOS) provides real-time weather information.

Landside Facilities

Hangars and Other Buildings. On the Airport Environs there are 89 buildings. On public property there are 14 buildings: five T-hangar buildings, seven conventional / multiple-aircraft hangars, and two other buildings (fixed base operator and fire suppression facility). On private property there are 75 buildings: six T-hangar buildings, 51 conventional / multiple-aircraft hangars, and twenty other buildings (businesses, office space, etc.). Below **Table 2B** lists those buildings, their ownership, and usage.

Aviation Services. A fixed based operator (FBO) is an individual or a business that offers aviation-related services such as flight instruction, aircraft rental, aircraft maintenance, hangar/tiedown storage,

[2] RNAV (Area Navigation) is a method of navigation that allows aircraft to choose any course within a network of navigation beacons, rather than navigating directly to and from the beacons. GPS (Global Positioning System) is a space-based global navigation satellite system. LOC (Localizer) is an approach type that provides runway centerline guidance to aircraft. VOR/DME (very high frequency omnidirectional radio range / distance measuring equipment) is a type of radio navigation system.

and aircraft fueling to Airport users. There are currently three FBOs at the Airport: Aurora Aviation, Aurora Jet Center, and Willamette Aviation Service.

Table 2B. Building Ownership and Use

Land Ownership	T-Hangar Buildings[3]	Conventional / Multiple-Aircraft	Other (business, office, etc)	Total
Public (ODA)	5	7	2	14
Private	6	51	18	75
Total	11	58	20	89

Airport Access and Vehicle Parking. There are multiple access points to the Airport. Exhibit 2B depicts these locations. A colored gate system has been employed by private businesses at the Airport to assist in emergency response and advertisement. These gates are also depicted on the exhibit. Businesses must offer adequate parking for employees and customers. Individual tenants park adjacent to or in their hangars while flying; some parking lots are available for their use, as well.

Airport Support Facilities

Emergency Services. The Aurora Rural Fire Protection District provides fire protection. A 500,000-gallon fire suppression system was recently installed to assist the District in protecting the Airport. The Marion County Sherriff Department and Oregon State Police provide emergency services.

Airport Maintenance. Airport maintenance is provided by ODA. Mowers, trucks, and other maintenance equipment are stored at their office/maintenance building in Salem. ODA has recently begun to utilize the services of the Oregon Department of Transportation (ODOT) for a majority of the mowing that occurs at the Airport. ODA provides snow removal services.

Airport Fencing. Fencing surrounds the perimeter of the Airport Environs. All access points are gated, although not all are automated. The non-automated gates sometimes remain open during normal business hours.

Utilities. Utilities and public services provided at the Airport include:

- Water – Individual well system
- Sanitary Sewer – Individual drain field / septic tank systems
- Telephone – Local franchise companies
- Electricity – Portland General Electric

[3] Multiple aircraft are stored in each T-Hangar building.

Surrounding communities have expressed concerns that additional growth at the Airport and the potential for Airport expansion will have negative impacts upon their water supplies and/or water quality. Advanced planning and feasibility assessments regarding the Airport's ability to meet water, sewer, and fire protection needs for development and expansion are of concern. While not required as part of the Airport Master Plan Update and not included in this document, the ODA recognized the importance of completion of this work in the future. ODA is supportive of pursuing funding options for such studies and supports surrounding communities in their support of funding such studies.

Airport Signage. Guidance signs to the Airport are located on Interstate 5, Highway 551, Arndt Road, Airport Road, and Keil Road and are maintained by ODOT. The colored gate system also provides signage to individual businesses.

Other Support Facilities. There are no restaurants on Airport; however, food service trucks are regularly located at the Airport. Additionally, Langdon Farms and the Cities of Aurora and Wilsonville offer restaurant options. Aurora offers public transportation, lodging, and tourism activities within walking distance of the Airport.

AIRSPACE

The FAA is responsible for the control and use of navigable airspace within the United States. Aircraft in flight, whether approaching or departing an airport, are subject to varying degrees of FAA control depending on location and meteorological conditions. These levels of control are called airspace classes. The alphabet characters A through G distinguish classes. Each class has its own unique shape and rules that govern such things as visibility minimums and cloud clearances.

The Airport is located in Class G airspace. Class G airspace is considered uncontrolled airspace in that pilots are not required to communicate with air traffic controllers; however regulations regarding visibility minimums and cloud clearances still apply. The Airport's airspace is depicted on the Seattle sectional chart (see **Exhibit 2E)**. The Airport is located south of Portland International Airport (PDX) and northeast of Salem McNary Field. Several private airports are also in the surrounding area. The Airport's location is such that it lies underneath two Victor Airways (V165 and V500), which are "highways in the sky." A Victor Airway is a corridor of protected airspace defined by radio navigational aids. In the case of the Airport, the Victor Airways (depicted with semi-transparent blue lines on Exhibit 2E) lead to PDX, making over flying traffic a common occurrence.

Traffic flows at the Airport are standard, left-hand patterns. Pilots are to fly the patterns at 1,000 feet above ground level (1,200 feet mean sea level). In 2002, ODA commissioned an airport noise mitigation study that recommended Runway 35 be designated the calm wind runway, to avoid frequent operations over noise-sensitive residential properties. ODA reports that complaints from neighboring Aurora have dropped since this designation was enacted, although complaint levels from the north have remained at a consistent level. There have been complaints by users that this scenario creates unnecessary conflicts

between VFR traffic (landing northbound) and IFR traffic flying approaches to Runway 17 (landing southbound) during visual meteorological conditions.

LAND USE PLANNING AND ZONING

The following land use and zoning discussion focuses on four areas:

- Airport Environs zoning and land use.
- Surrounding area zoning and land uses.
- Protection of airport airspace to prevent hazards and land uses that may interfere with the safety of aircraft operations.
- Ownership/control of Airport runway protection zones to enhance the safety of people and property on the ground.

Federal, State, Regional, County, and City land use regulations need consideration when reviewing existing land uses for airport compatibility and when planning for future development at and around an airport.

Federal regulations are also concerned with airspace protection (14 CFR Part 77) and noise levels, particularly for areas that fall within the 65-decibel (dBA) noise contour line. 14 CFR Part 77, *Objects Affecting Navigable Airspace,* establishes obstruction standards used to identify potential adverse effects to air navigation and notice standards for proposed construction. Imaginary surfaces are the basis for protecting the airspace around runways. There are five imaginary surfaces: primary, approach, transitional, horizontal, and conical. Definitions of each imaginary surface will be discussed in a later chapter. These surfaces should be kept clear of all obstructions.

FAA guidelines state that before FAA grants can be received the Airport Sponsor must provide assurances that appropriate actions have been (or will be) taken, to the extent reasonable, to restrict the use of land adjacent to or in the immediate vicinity of the Airport to those that are compatible with normal airport operations.

Existing Airport Environs Zoning and Land Use

The entire Airport Environs is zoned as "Public" in the Marion County Zoning Code (see **Exhibit 2F**). Marion County is the planning and building permit authority for the Airport. The Airport's existing zoning classification partially complies with Oregon Revised Statutes (ORS) 836.600 through 836.630, Local Government Airport Regulation. The county has adopted airport overlay imaginary surface protection which mirrors Part 77 imaginary surfaces. However, Marion County has not adopted the standards of ORS 836.616 which authorizes certain airport uses and activities to occur at the Airport.

Clackamas County and Aurora have both enacted Airport Overlay Zones as required by ORS 836.600 through 836.630.



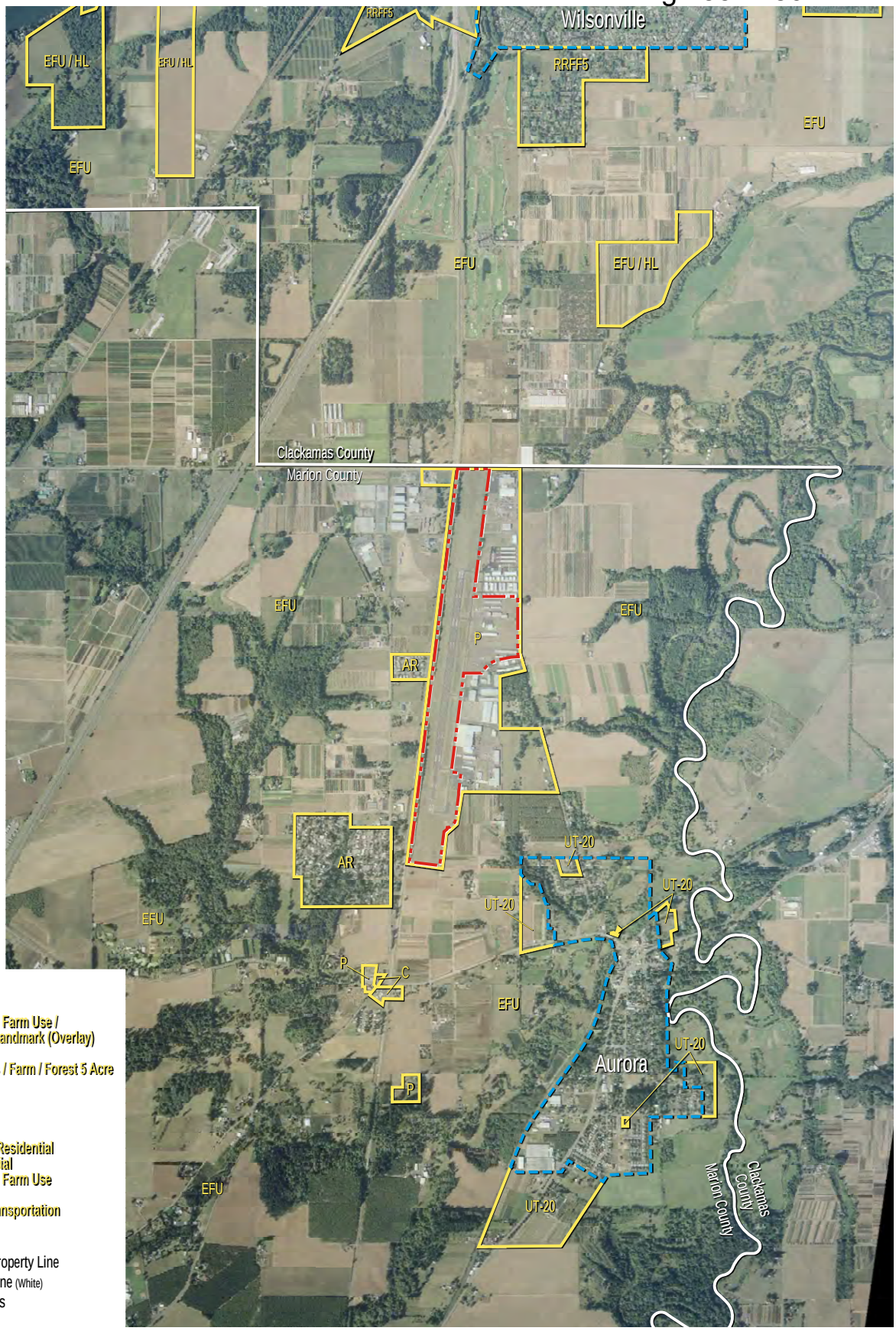
Exhibit 2E ~ Airspace

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Aurora, OR

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Clackamas Co Zoning

EFU / HL	Exclusive Farm Use / Historic Landmark (Overlay)
RRFF5	Rural Res / Farm / Forest 5 Acre

Marion Co Zoning

AR	Acreage Residential
C	Commercial
EFU	Exclusive Farm Use
P	Public
UT-20	Urban Transportation

Airport Property Line
County Line (White)
City Limits

Exhibit 2F ~ Zoning Map

Aurora State Airport

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Surrounding Area Zoning and Land Use

The Airport is surrounded primarily by agricultural and rural residential land uses. Land to the east, south and west is within Marion County, while land to the north resides in Clackamas County. The zoning is predominantly Exclusive Farm Use, with two residential areas zoned Acreage Residential west of the Airport and a golf course and rural residential (5-acre) north of the Airport.

A section of the Airport and the surrounding lands are reference in the Urban Growth Boundary Coordination Agreement with Marion County, as an Area of Mutual Concern for the City of Aurora. Additionally, the ODA, Marion County, and City of Aurora have an Intergovernmental Agreement supporting communication between the involved parties relating to the Aurora State Airport. Within the City of Aurora Comprehensive Plan, the Airport is referenced in Goals 9, 11, and 14.

The Airport Master Plan is incorporated by reference in the 2005 Transportation System Plan (TSP) for Marion County, which is currently being updated. The TSP identified an Access Management Plan for the Wilsonville-Hubbard Highway (Highway 551) and Arndt Road intersection and indicated that the intersection would be operating at a level of service (LOS) 'F' (maximum volume/capacity) by 2015. The TSP identified improvements at this intersection as a 0-5 year priority to resolve congestion and safety problems. The TSP also indicated the intersection of Arndt Road and Airport Road would be operating at LOS 'F' in 2015. The TSP identifies this improvement as a 5-10 year priority to resolve congestion issues. Clackamas County TSP (2002) also identified improvements in the Arndt Road corridor from Airport Road to Ore 99E in its 20-year Capital Needs list (although this project was shelved in the County's 2006-08 Capital Improvement Plan). The Clackamas County TSP states the goals of minimizing conflicts between airports and other uses, and coordination with Marion County to implement regulations on development near the Airport.

Protection of Airport Airspace

The FAA requires that airport sponsors – to the extent of their ability – restrict zoning on adjacent lands and lands within an airport's immediate vicinity to compatible land uses. Marion County has established an Airport Overlay Zone to protect the Airport and its airspace from hazards to air navigation, such as tall structures and other non-compatible land uses. An overlay zone may restrict the height of buildings and other structures or trees. Airport overlay zones also may restrict any land use that would create such hazards as electrical interference with airport radio communications, cause glare or impair visibility near the airport or would attract wildlife.

Ownership/Control of Runway Protection Zones

Runway Protection Zones (RPZs) are designated areas off runway approaches that enhance the protection of people and property on the ground. RPZs are trapezoidal in shape and have dimensions determined by the aircraft type and runway approach visibility minimums. The FAA strongly encourages Airport Sponsors to either own or exercise land use control within the RPZs. If an airport does not own the RPZs in fee, control of obstructions to airspace can be achieved through avigation easements. ODA owns all property within the Airport's two RPZs, except for a small portion that overruns onto Columbia Helicopters' property.

ENVIRONMENTAL INVENTORY

The purpose of this section is to summarize the environmental setting of the Airport, and identify any potential environmental constraints.

Environmental constraints for airports typically fall into two general categories: human environment and natural environment. Human factors that can constrain airports include existing settlements and incompatible land use, noise, social or socioeconomic conditions, light and glare, and the general controversial nature of airports. Natural environmental elements include various aspects of air quality, water resources, fish and wildlife, hazardous materials, energy and other resource issues.

Human Factors

Noise. The Airport currently supports about 87,345 annual operations (2008 FAA Terminal Area Forecast), mostly single engine aircraft. The typical threshold of concern is when the 65 DNL contour extends over noise sensitive land uses. Because the majority of the adjacent land is in agricultural use, the number of noise sensitive uses is minimal. Another threshold of significance is 90,000 annual adjusted propeller operations. The current usage of the Airport is approaching this level. Noise modeling will be prepared as part of this Master Plan, and the 65 DNL contour will be identified for the future anticipated airport use. Per Oregon Department of Environmental Quality guidelines, the 55 DNL will also be shown, even though Oregon has suspended its noise program.

Noise associated with the Airport is an existing issue for the communities of Aurora and neighboring Charbonneau and Deer Creek. In 2002, ODA commissioned a noise mitigation study. Recommendations of that study were to adopt a noise abatement procedure and implementation program, and change the calm wind Runway designation to Runway 35. Both of these recommendations have since been implemented. Additionally, a noise committee has been formed in association with Positive Aurora Airport Management (PAAM) to monitor noise issues.

Land Use. The Marion County zoning map designation for the Airport Environs is Public. Airports and airport-related commercial and industrial uses are conditional uses in the Public zone. The airport is surrounded primarily by land zoned for Exclusive Farm Use. Further to the north of the Airport are rural residential-farm forest (5-acre) zoned lands and a golf course, along Airport Road. To the west, along the Wilsonville-Hubbard Highway and Boones Ferry Road, there are two residential areas zoned Acreage Residential. Marion County also has an Airport Overlay Zone for Aurora State Airport.

The Airport Master Plan is incorporated by reference in the 2005 Transportation System Plan for Marion County. This plan is currently being updated.

Social Impact and Induced Socioeconomic Issues. Social impacts are typically related to relocation of businesses, residences or the alteration of established patterns of life (e.g. roadway changes, new facilities that divide a community, et cetera.) per the National Environmental Policy Act. In the event the State acquires additional land for airport expansion, existing homes or businesses may be required to relocate.

Socioeconomic issues include the potential for the Airport to provide an economic attraction to the community, including on-airport jobs, off-airport jobs that are supported by the Airport, or some attraction that provides incentive to use the Airport. The Airport provides some positive economic benefit to the community—flight lessons, aircraft repair, and other services. The Airport also has land and buildings that provide rental income to the State. According to Airport Management, there have been two or three businesses considering locations in Clackamas or Marion counties, and the location of the Airport and the ability to base a corporate aircraft there have factored into these considerations.

Environmental Justice is a specific aspect of socioeconomic impact that addresses whether a facility places a disproportionate burden on a population that is otherwise subject to perceived discrimination or other burden, for example a low-income or ethnic minority community. There do not appear to be populations meeting the definition within the immediate airport vicinity.

Historic Properties, Cultural Resources (Section 106 Resources). The site has been an airport since 1943. The subject site has been disturbed during the construction of the initial airport, construction of private hangars and other structures, the extension of the runway and taxiway extension in 1990, and for more recent runway reconstruction and taxiway relocation projects at the Airport. During excavation for these activities, no artifacts were found.

Historically, the land fell into the range of the Ahantchuyuk tribe of the Kalapuya Indians, now one of the Confederated tribes of the Grand Ronde. Cultural resource studies and tribal consultation were performed for the 2005 taxiway relocation project. No resources were identified and the tribe concurred that the property is not of interest.

Recreational Lands (Section 4(f)) Resources. There do not appear to be any public recreation areas in the immediate vicinity of the Airport.

Wild and Scenic Rivers. There do not appear to be any designated or candidate Wild and Scenic Rivers in the immediate vicinity of the Airport.

Farmland Preservation. Certain types of soils are considered prime farmland because of their drainage, mineral, and other characteristics. These soils, when in urbanized or developed areas, are not considered prime due to the compaction and other activities that degrade the potential for farm use. The Natural Resources Conservation Service on-line soil database map (OR643 Soil Survey of Marion County, Oregon) found nine soil types in the Airport area. All but one of these soil types has the potential to be either prime farmland or farmland of statewide significance, under the NRCS classifications. Soils can meet these classifications with either irrigation or drainage, depending on the soil type. In addition, much of the area around the Airport is designated Exclusive Farm Use (EFU), a state-defined zoning category for land considered prime farmland. Furthermore, some of the farmland near the Airport has been classified by the Oregon Department of Agriculture as Foundation Farmland.

FAA Guidelines state that the Farmland Protection Policy Act (FPPA) is not applicable and no formal coordination with the Natural Resource Conservation Service (NRCS) is required if any of the following conditions apply:

- The land was purchased prior to August 6, 1984, for purposes of being converted.
- Acquisition does not directly or indirectly convert farmland (e.g., land acquired for clear zones or noise compatibility). Indirect conversion includes any use of land or operation of the facility, which would prohibit the land from being farmed.
- The land is not prime farmland as defined in the FPPA.
- The land is not unique farmland.
- The soils are not considered prime farmland.
- The land has not been determined by a state or local government agency, with concurrence of the Secretary of Agriculture, to be of statewide or local importance.

Development of any land acquired outside of the existing Airport would be subject to NRCS coordination. The NRCS coordination is conducted by FAA per NEPA requirements, once a project is identified and if the project includes a taking of farmland. Through consultation, the NRCS would need to be shown there is no feasible and prudent alternative to taking farmland for the use.

Light and Glare. On-airport lighting is focused for visibility to aviators, without creating a disturbance or distraction. Any additional facilities will need to consider the impact of light or glare, including the use of windows or roofing material, on aviation. Similarly, residences and other sensitive receptors are located some distance from the Airport. Any additional lighting or structures will need to be focused such that light or glare is not projected into the community.

Natural Factors

Air Quality. The Airport is just outside of the Portland Air Quality Maintenance Area, in a "non-classified" area. Any construction impacts will need to consider the impact of particulate material on the local environment, including water quality and other resources. There are no "air quality hot spots" for surface transportation facilities in the airport vicinity. General aviation airports typically do not generate significant amounts of surface traffic. However, to provide information for the Master Plan, the ODA is investigating the possibility of sampling traffic at Airport access drives, to quantify the Airport's contribution to traffic on surrounding roads.

Water Quality. The Airport site lies on the boundary between the Pudding River basin and Middle Willamette River subbasin. Creeks include Deer (Pudding basin), Senecal and Mill Creeks (both Middle Willamette). The Pudding River has been listed by the DEQ for exceeding standards for temperature, fecal coliform and DDT. Mill Creek has been listed for temperature.

Projects on the Airport to modify the taxiway included improvements to the stormwater collection system and a modification to the Airport's NPDES permit. Any additions to impervious surfaces or changes in drainage plans for the Airport must be evaluated in the context of the permit conditions.

Plants and Animals, Including Endangered and Threatened Species and Essential Fish Habitat (MSA resources). The Airport is located within the Willamette Valley Ecoregion, located between the Coast Range and the Western Cascades in northwestern Oregon. The abundant rainfall and fertile soils make the valley Oregon's most important agricultural region. As a result, the Willamette Valley comprises Oregon's most altered ecoregion.

The Willamette Valley's location on the Pacific Flyway makes it an important area for migrating and wintering waterfowl. Geese and shorebirds benefit from flooded agricultural lands, and the Willamette River and its many tributaries support salmon and steelhead runs, mostly of hatchery origin due to the large number of dams in the system. The valley's few remaining fragments of native prairie support many special plant species and endemic invertebrates, while the remaining wetlands provide habitat to the Oregon chub, the western pond turtle and many other sensitive animal species.

The Airport does not currently have any issues with wildlife or bird strikes.

The Airport Environs includes site conditions typical of an airport facility in regards to the maintenance of the grounds and vegetation. Existing vegetation includes a mixture of invasive and native species, predominantly made up of grasses and forbs. An extensive mowing schedule maintains all vegetation for airport safety and visibility as required by FAA regulations. A row of trees along the west side of the Airport will be removed in fall 2010, because many of the trees are obstructions that penetrate the imaginary transitional surface.

The nearest waterways are the Pudding River and Deer Creek. Each system is approximately the same distance from the Airport, with the nearest tributary drainage located approximately 3,300 feet from the Airport. The Pudding River has a documented population of both Upper Willamette River Steelhead and Chinook salmon, both listed as Threatened under the Federal Endangered Species Act (ESA).

Previous environmental reviews for projects at the Airport have identified the potential for the following listed species, as well as their critical habitat (where defined) in the airport vicinity: Upper Willamette River Steelhead (*Oncorhynchus mykiss*), Upper Willamette River Chinook Salmon (Oncorhynchus tshawytscha), Fender's blue butterfly (*Icaricia icarioides fenderi*), Golden Indian Paintbrush (*Castilleja levisecta*), Willamette Daisy (*Erigeron decumbens var. decumbens*), Howellia (*Howellia aquatilis*), Bradshaw's lomatium (*Lomatium bradshawii*), Kincaid's lupine (*Lupinus sulphureus var. kincaidii*), and Nelson's checker-mallow (*Sidalcea nelsoniana*). Several candidate species potentially may occur in the Airport area: Yellow-billed cuckoo (*Coccyzus americanus*), Streaked horned lark (*Eremophila alpestris strigata*), Oregon spotted frog (*Rana pretiosa*), and Taylor's checkerspot (*Euphydryas editha taylori*). The agencies found no proposed species within and/or adjacent to the area.

Any activity on the Airport would need to consider impacts to these species under the Endangered Species Act as well as habitat impacts under the Magnuson-Stevens Act.

Wetlands and Floodplains. Because of previous projects on the Airport, on-airport wetlands have been significantly reduced. A brief review of the Airport shows that some of the on-airport drainage ways are developing wetland-like characteristics, as has the septic drain field area. Because these are

man-made wetlands in upland areas, they will likely not be considered jurisdictional. At the time of any development action affecting the infield area or drainage ways, a formal delineation will be prepared.

The Airport is outside of any known floodplain.

Energy Supply and Natural Resources. This category focuses on the impact of airport actions on energy and natural resources used in construction materials. In general, construction materials are not in short supply. Fuel for construction equipment is available nearby. The site has adequate electrical supply to provide power to navigation aids and security lighting on the Airport.

Solid Waste. Typically, general aviation airports do not generate significant amounts of solid waste. Often materials include food and beverage containers or packaging for aircraft maintenance products. Food containers may create a bird and rodent attractant.

During construction, pavement materials are often recycled into the new pavement, reducing the need for disposal.

Plans for future activity at the Airport should consider the manner in which waste is collected and removed.

Hazardous Materials. The Airport has four commercial fueling sites (Columbia Aviation, Aurora Jet Center, Aurora Aviation, and Willamette Aviation Service), and two private fuel sites.

There is potential for additional contamination anywhere maintenance or fueling takes place because of accidental spills. No exploration of this has occurred on the Airport. Any such areas where construction is proposed would need to undergo some level of due diligence such as a "Phase One Environmental Site Assessment" to identify any history of possible contamination.

Construction Impacts. Construction impacts typically include temporary noise, dust or traffic impacts, as well as the potential for erosion and water quality impacts associated with construction material spills. Once construction activities are identified, construction timing, phasing and mitigation measures need to be considered.

Controversy. Controversy is typically associated with off-airport impacts. In the case of Aurora, controversy appears to revolve around use of the Airport by jets and the associated noise. According to ODA, there are some members of the community who are against airport growth and desire closure of the Airport and release of the land to other uses. However, there are opinions that the Airport should exist but growth should have some constraints to insure livability in the community.

Other Issues. There do not appear to be any other environmental-related issues on or around the Airport.

Conclusion

The FAA considers public controversy to be an environmental issue. Beyond controversy over noise and airport expansion, there do not appear to be any significant environmental issues on the Airport or in

the airport vicinity – with the exception of concerns over vehicular traffic/safety. Additional study regarding noise, threatened and endangered species, cultural resources, and possibly hazardous materials should be conducted once a project is defined.

AVIATION ACTIVITY DATA

There are two primary measures of aviation activity at a general aviation airport: based aircraft and aircraft operations. Each activity type is discussed below.

Based Aircraft

Based aircraft are the number of aircraft that are stored at an airport in a hangar or tied down on either a paved apron surface or a grassy area designated for such a use. ODA's records indicate that there are currently 432 aircraft based at the Airport. Of the aircraft based at the Airport, they can be further broken down into the following categories:

Table 2C. Based Aircraft

Aircraft Category	Number Based at Aurora State Airport
Single Engine	312
Jet	21
Multi-engine	59
Helicopter	35
Glider	1
Unknown Category	4
Total	432

Aircraft Operations

Annual operations are the total number of aircraft takeoffs and landings occurring at the Airport in a year. A touch-and-go, which occurs during pilot training, counts as two operations. Touch-and-go operations are categorized as local, along with other operations that remain within 20 miles of the Airport. Operations not categorized as local are categorized as itinerant. The latest estimated data from the FAA's December 2009 Terminal Area Forecast is for 2008, and is shown in **Table 2D**.

Table 2D. Operations Records

	FAA Terminal Area Forecast (2008)
Air Taxi	9,656
General Aviation Local	36,030
General Aviation Itinerant	41,409
Military	250
Total	87,345

AIRPORT FINANCIAL DATA

The following subsections provide a brief summary of historical financial information for the Airport.

Airport Operating Revenues and Expenses

Table 2E shows the Airport's revenues and expenses for the past five years.

Federal grants from the Airport Improvement Program (AIP) are the major source of funding for airport capital expenditures. **Table 2F** depicts the AIP funding the Airport has received for airport improvement projects between the years 2004 and 2009.

RATES AND CHARGES

ODA leases hangar space to users at a rate of $0.25 per square foot. The lease rate is determined by market rent surveys; the last survey was completed in 2008. By administrative rule[4], ODA must review lease rates at a minimum of every five years and can adjust lease rates at intervals not to exceed every two years.

[4] Oregon Administrative Rule (OAR) 738-010-0035, *Fair Market Value Cost of Construction – Adjustments of Unimproved Land, Improved Land and Facility Rents*.

Table 2E. Revenues and Expenses

	2006 Actual	2007 Actual	2008 Actual	2009 Actual	2010 Actual
Operating Revenues					
Land Lease / Tie Downs	43,749.44	42,305.83	53,110.54	45,855.59	46,823.02
Ingress/Egress & Hangar Fees	37,017.09	40,610.85	52,052.17	59,500.39	47,366.48
Fuel Flowage Fees	13,488.88	66,289.12	67,177.75	62,075.82	55,395.68
Federal Funds Revenue	117,339.12	84,469.00	2,599,549.00	1,809,250.04	294,010.79
Miscellaneous Fees	12,289.13	14,418.03	4,641.53	11,649.62	12,208.94
Total Operating Revenues	**$223,883.66**	**$248,092.83**	**$2,776,530.99**	**$1,988,331.46**	**$455,804.91**
Operating Expenses					
Personal Services	11,816.47	19,288.20	21,268.89	20,792.93	14,336.84
Agency Program Related SVCS & Supplies	2,101.26	2,629.91	14,074.00	813.63	845.36
Attorney General Legal Fees	-	13,023.00	21,478.36	16,455.14	29,369.77
Dues and subscriptions	-	-	-	-	75.00
Expendable Property $250-$5000	-	398.90	-	-	-
Facility Maintenance	8,414.91	10,276.43	6,270.62	3,290.91	4,610.89
Facilities Rent and Taxes	3,903.60	21,629.21	28,771.31	23,630.02	21,189.81
Fuels and Utilities	6,222.62	7,300.40	7,713.21	7,901.13	6,752.24
Instate Travel	294.28	39.00	36.31	-	-
Office Expenses	167.92	38.50	46.14	-	14.25
Other Services and Supplies	17.94	-	250.00	-	-
Professional Services	13,705.25	252,602.55	2,036,983.28	1,545,742.74	360,560.21
Publicity and Publications	-	-	-	15.08	-
Telecomm/Tech SVC and Supplies	2,282.19	1,950.75	2,018.26	404.80	-
Total Operating Expenses	**$48,926.44**	**$329,176.85**	**$2,138,910.38**	**$1,619,046.38**	**$437,754.37**

Source: Oregon Department of Aviation (2010, August). State Fiscal Year July 1 to June 30.

Table 2F. Recent Federal Grant Projects

Year	Project	AIP Funding Received
2004	Rehabilitate Runway 17/35, including runway lighting system (Phase 1)	$1,445,140.00
2005	Rehabilitate Runway 17/35, including runway lighting system and revising the ALP (Phase 2); Rehabilitate taxilane	$ 957,144.00
2007	Construct taxiway, including land acquisition and design (phase 2); Install medium intensity taxiway lighting (MITL); Replace beacon and tower	$1,959,856.00
2007	Construct taxiway (Phase 3), including revising the ALP; Install MITL; Replace beacon and tower (Phase 2)	$2,405,233.00
2009	Remove obstructions (Phase 1)	$ 100,000.00
2009	Master Plan Update/Control Tower Siting Study	$ 534,431.00
	Total Federal Dollars	$7,401,804.00

Source: Federal Aviation Administration (2010, August)

Chapter Three: AERONAUTICAL ACTIVITY FORECAST

Airport Master Plan Update

Aurora State Airport

Forecasting aviation demand helps determine the size and timing of needed airport improvements. This chapter indicates the types and levels of aviation activity expected at the Aurora State Airport (Airport) during a 20-year forecast period. Projections of aviation activity for the Airport were prepared for the near-term (2015), mid-term (2020), and long-term (2030) future.

These projections are unconstrained and assume the Oregon Department of Aviation (ODA) or others will be able to develop the various facilities necessary to accommodate based aircraft and future aircraft operations. When development alternatives are evaluated later in the planning process, ODA may choose not to meet the unconstrained demand. ODA has chosen not to constrain the forecasts because undeveloped land to accommodate growth is available. In addition, the preparation of unconstrained forecasts follows the typical Federal Aviation Administration (FAA) practice. In individual airport forecasts it prepares annually, the FAA "…assumes an unconstrained demand for aviation services based upon local and national economic conditions as well as conditions within the aviation industry. In other words, an airport's forecast is developed independent of the ability of the airport and the air traffic control system to furnish the capacity required to meet demand."[1]

The primary objective of forecasting is to define the magnitude of change that can be expected over time. Because of the cyclical nature of the economy, it is impossible to predict with certainty year-to-year fluctuations in activity when looking 20 years into the future. However, a trend can be established that characterizes long-term potential. While a single line expresses the anticipated growth, actual growth may fluctuate above and below this line. **Forecasts serve only as guidelines, and planning must remain flexible to respond to unforeseen changes in aviation activity and resultant facility needs.**

[1] Federal Aviation Administration. (December 2009). *Terminal Area Forecast Summary, Fiscal Years 2009-2030*. p. 3.

This chapter presents the following forecasts:

- **Based Aircraft, Including Fleet Mix.** The number and type of aircraft based at the Airport help determine the future aircraft hangar, apron, and auto parking facility requirements. Fleet Mix refers to the distribution of aircraft by type.

- **Aircraft Operations, Including Annual, Peak, Local vs. Itinerant, and Fleet Mix.** An operation is counted as an aircraft either landing or taking off (*i.e.*, an aircraft landing then taking off counts as two operations). Local operations are touch-and-go and other training operations that stay near the airport. The operations forecast helps in analyzing runway capacity and determining runway, taxiway, and navigational aid requirements. The aircraft operations forecast provides some of the input for the computer modeling that estimates future aircraft noise exposure.

- **Critical Aircraft and Airport Reference Code.** The critical aircraft is derived from the operational fleet mix. The critical aircraft and its airport reference code determine many airfield design requirements, such as runway and taxiway size and strength, and safety clearances around aircraft movement areas.

National, state, and regional trends and forecasts for the aviation industry are reviewed in this chapter, along with socioeconomic trends and forecasts, to assess their effect on past and future aviation activity at the Airport.

Historical activity at the Airport is analyzed for growth trends that help forecast aviation demand. Sources of historical data include the FAA's Terminal Area Forecast (TAF) and based aircraft inventory, ODA's record of current based aircraft and recent fuel flowage, records of flight plans filed under Instrument Flight Rules (IFR), the airport user survey conducted as part of this planning study, and anecdotal information provided by some businesses at the Airport.

The TAF is the FAA's annual forecasting for terminal control centers and for the approximately 3,300 individual airports that are in the National Plan of Integrated Airport Systems (NPIAS). "The TAF is prepared to assist the FAA in meeting its planning, budgeting, and staffing requirements. In addition, state aviation authorities and other aviation planners use the TAF as a basis for planning airport improvements."[2] The TAF provides a benchmark for individual master plan forecasts. The FAA may modify or update the TAF based on an approved master plan forecast. If an airport master plan forecast for operations exceeds the TAF by more than 10% in the first five years, FAA Headquarters must review the forecast. According to Par. 428.a, FAA Order 5100.38C, the lack of FAA acceptance of forecasts may delay any further planning or capital improvements depending on them.

Prior forecasts specific to Aurora State Airport are presented for comparison to the historical records of activity that have occurred and for comparison to the forecasts developed for this study. These other

[2] Federal Aviation Administration. (December 2009). *Terminal Area Forecast Summary, Fiscal Years 2009-2030.* p. 3.

forecasts include the FAA's Terminal Area Forecast (December 2009), the Oregon Aviation Plan (2007), and the prior Aurora State Airport Master Plan (2000).

The forecasts presented in this chapter are consistent with the Airport's role as an urban general aviation airport; they do not anticipate a major role change, such as the initiation of commercial passenger or cargo service.

NATIONAL AVIATION TRENDS AND FORECASTS

Aurora State Airport is part of an air transportation system and, as such, is subject to national and regional aviation trends.

General aviation (GA) in the United States peaked in the 1970s, and then experienced years of decline until growth returned in the 1990s. The growth in the 1990s was due not only to an expanding economy, but also to the General Aviation Revitalization Act (GARA) of 1994. GARA set an 18-year limit on the liability of GA aircraft and component manufacturers, spurring production of single engine piston aircraft. Single engine piston is the aircraft type that accounts for the majority of the nation's GA activity.

The business aviation portion of GA grew rapidly in the 1990s and into the first part of the 21st century. Airplanes used for business tend to be larger and faster than those limited to personal use, although business use of GA aircraft ranges from small, single-engine aircraft rentals to multiple aircraft corporate fleets supported by dedicated flight crews and mechanics. Since 9/11, business aviation has benefited from airline service problems—the additional airline passenger and baggage security imposed and reductions in air service, particularly to smaller communities. Until 2008, business aviation grew rapidly as various chartering, leasing, time-sharing, fractional ownership,[3] interchange agreements, partnerships and management contracts emerged.

GA growth began to decline in 2008 and 2009, due primarily to the economic recession that began the end of 2007. Soaring fuel prices in mid-2008 kept some airplanes parked. From a high of $129.03 per barrel in July of 2008, the price of oil dropped to $37.45 in January 2009, when demand for oil plummeted with the economy. The recession dampened every aspect of GA—from flight training and aircraft production, to the number of pilots and the hours aircraft are flown. The harm to the development of new aviation technology and businesses is exemplified by the Eclipse and DayJet stories. Eclipse Aviation was the leading developer and manufacturer of a new aircraft type, the Very Light Jet (VLJ). The VLJ is a small, low-cost jet capable of using short runways and offering the speed and comfort of high-altitude jet flight. Eclipse was the first to deliver a VLJ in late 2006. DayJet, operating a fleet of Eclipse aircraft in the Southeastern U.S., employed a unique air taxi business model, "per seat, on-demand", which was a radical change from the tradition of a single customer chartering a whole aircraft.

[3] Fractional aircraft ownership is similar to real estate time-sharing.

After producing 260 VLJs, Eclipse Aviation declared bankruptcy in November 2008. DayJet ceased operating in September 2008, blaming the tight credit market for its demise.

According to the *FAA Aerospace Forecasts Fiscal Years 2010-2030* (March 2010), "Each passing month of 2009 saw the light on consumer confidence dim as housing foreclosures climbed, credit tightened, and unemployment surged." The bad news the FAA reported about 2009 included the following:

- The world economy declined 2.4%, while the U.S. economy declined 2.5%.
- The market for GA products and services declined sharply.
- Compared to 2008, which had declined from the previous year, U.S. manufacturer aircraft shipments declined 48.5% and billings fell 32.1%.
- Student pilots decreased 10.8%, the fifth straight year of decline.
- GA flight hours decreased 10.3%.
- GA aircraft operations recorded by air traffic control towers fell 11.7% in 2009, one of the largest declines in that measure ever reported.

The General Aviation Manufacturers Association (GAMA) reported that the 2009 business jet sector declined following five straight years of growth.[4] The number of worldwide fractional share owners fell for the first time, from 5,179 to 4,881, and the number of airplanes in the fractional fleet decreased 5.2%. Aircraft shipments in the first quarter of 2010 were down 15% compared to the same period in 2009, although billings were up 7.1%.[5]

In spite of all the bad news, the FAA's March 2010 forecast stated, "Even though the highly cyclical U.S. aviation industry went into a downward spiral during 2009, history has shown the demand for air travel is resilient and growth will return." The U.S. economy grew in the fourth quarter of 2009 for the first time in five quarters, and the economies of most regions of the world appear to be recovering.

GAMA also reported that at the end of 2009, there were hopeful signs—the availability of used aircraft was declining, aircraft utilization was stabilizing, availability of financing was improving, and inquiries for new orders were starting to grow. Corporate profits were beginning to recover; profits are historically related to new airplane demand.[6] In May 2010, the GAMA President and CEO reported that flight activity is on an upward trend and the used aircraft inventory is decreasing, but the industry is far from recovery. He noted that the U.S. Congress' continuation of bonus depreciation is crucial to the industry's recovery.[7]

FAA Aerospace Forecasts Fiscal Years 2010-2030 projects recovery for GA, using economic forecasts developed by Global Insight Inc. to project domestic aviation demand. **Table 3A** shows the FAA's forecast for active GA and air taxi aircraft. An active aircraft is one that has a current registration and was flown at least one hour during the calendar year. The source of historical numbers is the FAA General Aviation and Air Taxi Activity (and Avionics) Surveys.

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[4] General Aviation Manufacturers Association: 2009 General Aviation Statistical Databook & Industry Outlook
[5] GAMA News 10-12, released 5-10-2010, www.GAMA.aero
[6] General Aviation Manufacturers Association: 2009 General Aviation Statistical Databook & Industry Outlook
[7] GAMA News 10-12, released 5-10-2010, www.GAMA.aero

Table 3A. U.S. Active General Aviation and Air Taxi Aircraft Forecast

Aircraft Type	2009 Estimated	Average Annual Growth 2000-2009 Historical	2009-2010	2010-2020 Forecast	2009-2030
Piston Fixed Wing					
Single Engine	144,745	-0.4%	-0.4%	-0.1%	0.2%
Multi-engine	17,351	-2.1%	-1.0%	-0.8%	-0.8%
Total	162,096	-0.6%	-0.5%	-0.2%	0.1%
Turbine Fixed Wing					
Turboprop	9,010	5.1%	1.0%	1.5%	1.4%
Turbojet	11,418	5.6%	3.2%	4.3%	4.2%
Total	20,428	5.4%	2.2%	3.1%	3.1%
Rotorcraft					
Piston	3,666	3.5%	4.5%	3.9%	3.4%
Turbine	6,540	4.3%	2.7%	2.7%	2.4%
Total	10,206	4.0%	3.3%	3.2%	2.8%
Experimental	23,435	1.5%	0.7%	2.3%	1.8%
Sport Aircraft	7,311	N/A	5.5%	5.6%	3.9%
Other[8]	5,673	-1.8%	0.1%	-0.1%	-0.1%
Grand Total	229,149	0.6%	0.2%	0.8%	0.9%

Source: FAA Aerospace Forecasts Fiscal Years 2010-2030 (March 2010)

The FAA forecasts growth in business aviation demand over the long term, driven by a growing U.S. and world economy. The more expensive and sophisticated turbine-powered fleet, including helicopters, is projected to grow at an average of 3.0% per year. The worldwide delivery of VLJs has been refreshed with the introduction of Embraer's Phenom 100 to the market. The FAA expects 440 VLJs to enter the U.S. fleet in the next three years, with an average of 216 per year for the remainder of the forecast period. Piston-powered aircraft are expected to decline through 2017 and then grow at a low rate. The FAA expects VLJs and sport aircraft to erode the replacement market for traditional piston aircraft at the high and low ends of the market respectively. Rotorcraft (helicopters) have experienced high growth since 2000, and growth is projected to continue.

Table 3B presents the FAA's forecast for aircraft hours flown. The number of GA hours flown is projected to increase by 2.5% annually. A larger portion of the growth is expected to occur in the short-term, post-recession period, where low utilization rates experienced in 2009 will return to normal, particularly for jets. Rotorcraft hours were relatively immune to the recession compared to other categories.

[8] Gliders and lighter than air vehicles

Table 3B. U.S. Active General Aviation and Air Taxi Hours Flown Forecast

Aircraft Type	2009 Estimated	Average Annual Growth 2000-2009 Historical	2009-2010	2010-2020 Forecast	2009-2030
Piston Fixed Wing					
Single Engine	11,436,000	-5.0%	-3.8%	1.0%	1.2%
Multi-engine	2,132,000	-5.1%	-1.3%	-1.1%	-0.2%
Total	13,568,000	-5.0%	-3.4%	0.7%	1.0%
Turbine Fixed Wing					
Turboprop	2,241,000	1.4%	1.4%	2.3%	1.7%
Turbojet	2,902,000	0.6%	0.1%	8.8%	6.1%
Total	5,143,000	0.9%	0.7%	6.4%	4.6%
Rotorcraft					
Piston	709,000	3.3%	2.4%	4.2%	3.5%
Turbine	2,356,000	4.0%	0.6%	3.3%	2.8%
Total	3,065,000	3.8%	1.0%	3.5%	3.0%
Experimental	1,031,000	-2.6%	-3.0%	5.3%	3.3%
Sport Aircraft	314,000	N/A	5.5%	7.7%	5.9%
Other[9]	208,000	-6.3%	-0.4%	0.4%	0.4%
Grand Total	23,330,000	-2.8%	-1.8%	2.9%	2.5%

Source: FAA Aerospace Forecasts Fiscal Years 2010-2030 (March 2010).

GA aircraft operations at FAA and contract towers are expected to continue declining in 2010, 3.1% from 2009, then rise 1.2% in 2011 and 2012 as unemployment decreases. For the whole forecast period, the expected GA aircraft operations growth at towered airports is 1.1% per year on average. The FAA expects military aircraft activity to remain constant through the forecast period.

The FAA identified the following risks to their forecasts:

- **Oil Prices.** Although oil prices were much lower in 2009 than in 2008, there is risk of rising oil prices when economic growth resumes. FAA's forecast, based on Global Insight's October 2009 forecast, calls for steady increases in oil prices after 2009, but does not expect the price to exceed $100 per barrel until 2025.
- **Business Aviation Risks.** Business and corporate aviation grew strongly after 9/11 but fell sharply with the economic recession. Public perception of business and corporate aviation, potential environmental regulations and taxes, and increased security measures could place downward

[9] Gliders and lighter than air vehicles

pressure on the forecast. On the other hand, new and more efficient product offerings and increased competition from new manufacturers could broaden the appeal. The growth of the on-demand air taxi industry that was expected with the VLJ entry into the market could materialize.

- **Environmental Concerns.** Air transportation could be constrained from growth by environmental concerns that might limit airport expansion or new construction or by the cost of meeting new air emissions standards. On the other hand, research and technological breakthroughs may overcome these constraints. Breakthroughs in cleaner, quieter, more efficient aircraft are possible, and Nextgen—the FAA's air traffic modernization program—promises to increase capacity at some airports without physical expansion and to reduce air and noise pollution.

STATE AVIATION TRENDS AND FORECASTS

Since 2000, aviation in Oregon has seemed to trend with the nation. In 2008, Oregon's share of the nation's active GA and air taxi fleet was 2.0%, the same share it was in 2000. The number of these aircraft was virtually the same in both years—4,687 in 2000 and 4,614 in 2008. The number peaked at 6,029 in 2007, which was also the national peak. Hours flown in GA and air taxi aircraft hit a low point in 2008 in Oregon (431,000) and in the US (26,009,000). Oregon's share of U.S. hours flown, 1.7%, was lower in 2008 than in the 2000 to 2007 period.[10]

The *Oregon Aviation Plan 2007 (OAP 2007)* used 2005 as the base year for forecasting. For statewide based aircraft, the forecast was an increase from 4,875 to 6,225 by 2025—a 1.23% average annual increase. The annual rate of growth was slightly lower than the FAA's national forecasts for active GA and air taxi aircraft, 1.29%. The mix of based aircraft was projected to remain 81% single engine, 7% multi-engine, 3% jet, 4% helicopter, and 5% other. Aircraft operations were projected to grow at the same rate as based aircraft.

OAP 2007 was prepared before the economic recession. GA did grow in Oregon from 2005 to 2007, and then dropped in 2008. Based aircraft declined 9% and operations declined 5%, most likely due to the economic downturn. However, from 2008 through 2030, the FAA's Terminal Area Forecast shows average annual growth of 1.2% for based aircraft and 1.1% for GA operations.[11]

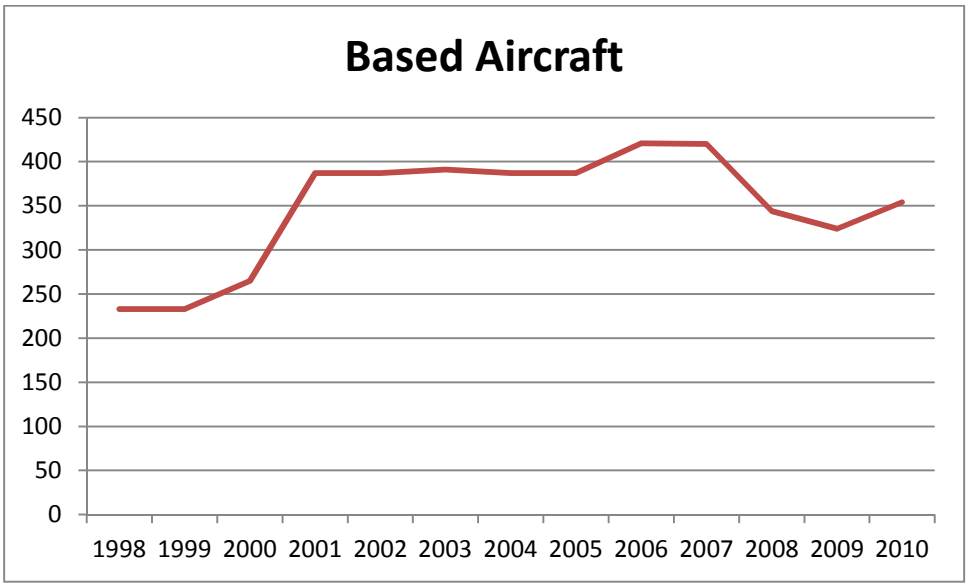
TRENDS AT AURORA STATE AIRPORT

The Airport began the 21st century with a surge in based aircraft (**Exhibit 3A**), in part, due to the increase in hangar capacity created by the Southend Airpark development. From 2001 to 2007, the number of based aircraft grew, and then declined in 2008 and 2009. In 2010, growth resumed.

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[10] General Aviation Manufacturers Association: 2009 General Aviation Statistical Databook & Industry Outlook
[11] FAA's Terminal Area Forecast (December 2009), which is limited to airports in the National Plan of Integrated Airport Systems (NPIAS)

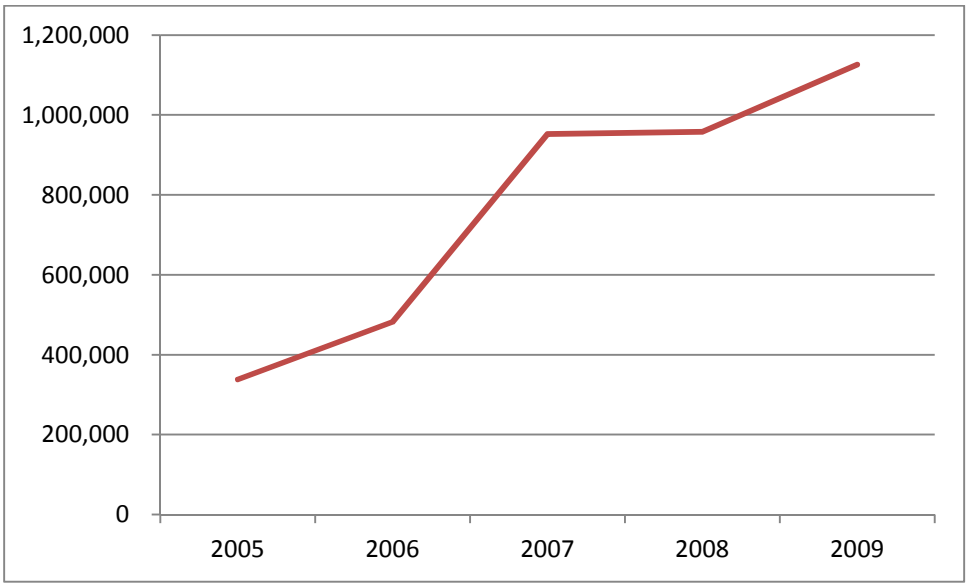
Exhibit 3A. Historical Based Aircraft at Aurora State Airport



Source: FAA Terminal Area Forecast (December 2010) for 1998 – 2010 numbers. ODA registration for 2010 numbers.

The ODA exacts fuel flowage fees on six businesses at the Airport: Aurora Aviation, Columbia Helicopters, Metal Innovations, Aurora Jet Center, TEC Equipment, and Willamette Aviation. Three of these businesses sell fuel to the operators of aircraft based at the Airport and to the operators of "transient" aircraft based at other airports. **Exhibit 3B** shows the combined fuel flowage of these businesses over the last five years. Fuel flowage is a relatively good indicator of the trend in aircraft operations, although fuel prices at other airports can affect where aircraft operators refuel. Exhibit 3B shows a sharp rise of 182% between 2005 and 2007, from 338,088 gallons to 951,870 gallons. Aviation gasoline (avgas) use dropped 47% from 2007 to 2008, while jet fuel gained 11%. Fuel flowage resumed growth in 2009, reaching 1,126,272 gallons.

Exhibit 3B. Historical Fuel Flowage at Aurora State Airport (gallons)

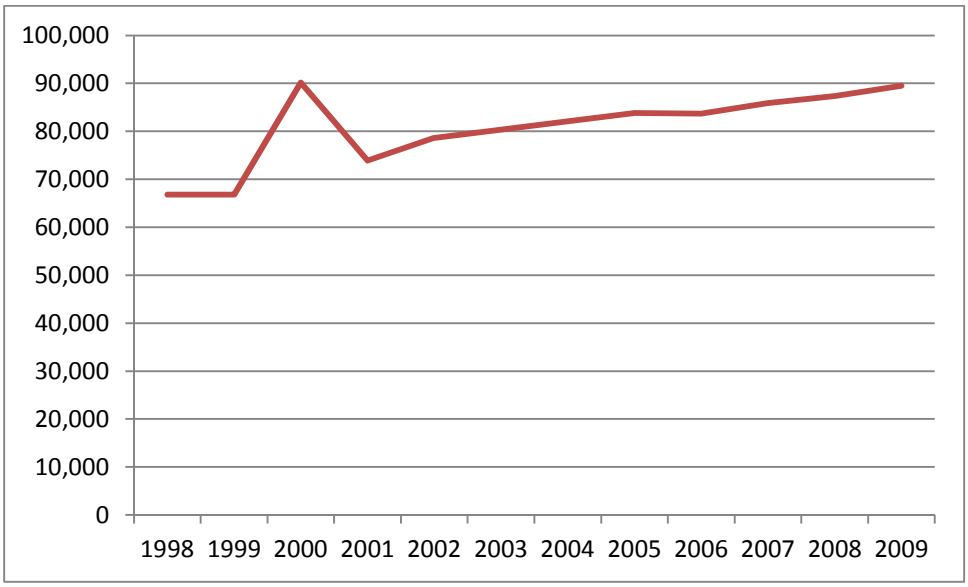


Source: Oregon Department of Aviation Records.

While the majority of aircraft based at and using the Airport are piston-powered and use avgas, about 85% of the fuel flowage is jet fuel and 15% is avgas. On average, jets have larger fuel tanks than piston-powered airplanes, and are flown more hours. ODA records and informal information from fueling operators indicate that jet fuel use is growing faster than avgas use. This implies operations by turbine-powered aircraft are growing more than piston-powered aircraft operations.

The FAA keeps records of estimated aircraft operations (takeoffs and landings) reported by airport owners on periodically updated Airport Master Records (FAA Form 5010). ODA submits Form 5010 updates every three years to the FAA Airport District Office in Seattle. The Airport District Office then reports estimated annual numbers to FAA Headquarters for inclusion in the TAF. **Exhibit 3C** shows the reported aircraft operations at Aurora State Airport for the years 1998 through 2009. Since 2001, operations at the Airport have grown slowly but steadily.

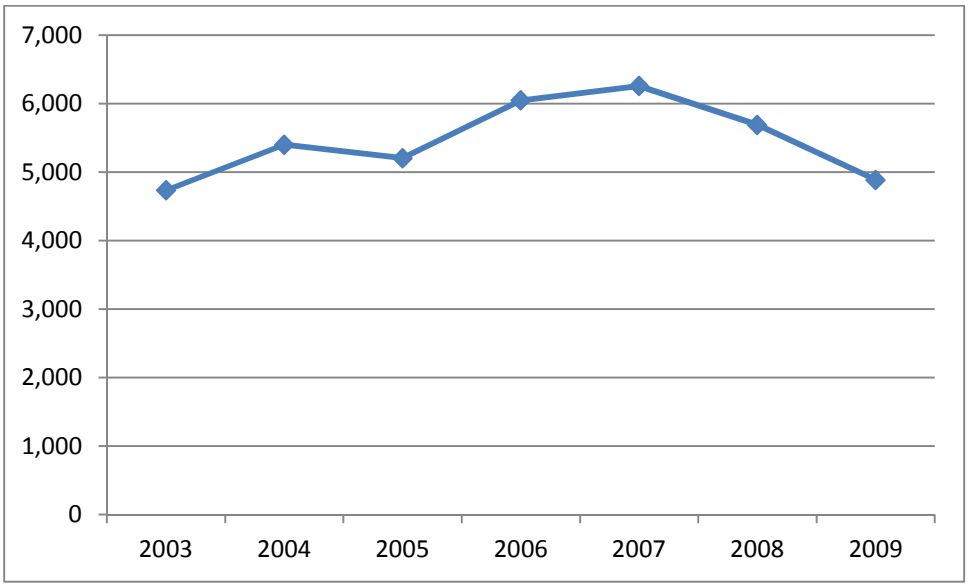
Exhibit 3C. Historical Aircraft Operations at Aurora State Airport



Source: FAA Terminal Area Forecast (December 2010).

IFR operations for the Airport appear in **Exhibit 3D**. These are actual IFR flight plans filed, although the records have been found to omit some flight plans filed after takeoff or cancelled before landing. Nevertheless, the operations in Exhibit 3D are more accurate than the total estimated operations shown in Exhibit 3C, although IFR traffic comprises only 5% to 10% of total traffic at the Airport. IFR traffic peaked at 6,257 operations in 2007, up 32% from the 4,734 operations recorded in 2003. Then traffic declined 9% to 5,688 operations in 2008. The decline continued (14% between 2008 and 2009), so that IFR ops in 2009 (4,886) were nearly the same as in 2003. The IFR activity of the last five years follows the trend of GA activity nationwide—growth to peak in 2007 and then decline in 2008 and 2009. Recovery appears to be underway. For the partial year 2010 (through August 18), IFR traffic is up 22% from the same period in 2009.

Exhibit 3D. Historical IFR Operations at Aurora State Airport



Source: Derived from IFR arrival and departure data, Airport IQ Data Center, GCR.

Businesses at the Airport have informally indicated that they have suffered during the recession. The decline in aircraft charters was the most severe, but hangar rentals, aircraft maintenance, aircraft sales and rentals, flight training, and avgas sales declined substantially. These businesses report they have fewer employees now than five years ago. However, they project business will grow between 1% and 3% per year in the future, and they will be expanding staff. Their projections for the Airport's future include continued increases in turbine-powered aircraft operations, more corporate and individual travel for business and pleasure, and declines in flight training and recreational flying.

SOCIOECONOMIC TRENDS AND FORECASTS

Aviation activity at an airport is usually tied closely to the population and economy within its service area. As the population around the airport grows, airport activity grows. Aviation activity has also traditionally been linked to employment and income factors because of the discretionary nature of personal and business travel.

This section defines the core service area for Aurora State Airport and analyzes the population and economy of the core service area and surrounding region.

Identification of Core Airport Service Area

As the strategic role analysis in Chapter 1 showed, the maximum extent of the Airport's service area is about 45 minutes. This 45-minute service area distance applies primarily to higher performance aircraft,

particularly transient aircraft. This is because jet aircraft generally need longer runways, instrument approaches, and more services (jet fuel, etc.) than the average GA airport has. The occupants of some transient aircraft using the Airport may be destined for downtown Portland, but the owners of smaller aircraft do not need to travel farther than 30 minutes to find an adequate airport for basing their airplanes. The typical GA airport's service area is within a 30-minute drive from the airport, or about 20 miles, although it depends on population density, the road network, and the location and services provided at other airports in the vicinity.

Airport Service Area Population

A 20-mile distance from the Airport extends into 59 zip codes located in five counties—Clackamas (18 zip codes), Marion (10 zip codes), Multnomah (14 zip codes), Washington (13 zip codes), and Yamhill (4 zip codes). **Table 3C** shows the population within this core service area in 2000.[12] Approximately half of the residential population of the five counties lives within 20 miles of the Airport. While the Airport is located in Marion County, Marion County accounts for less than 10% of the service area population. More than two-thirds of the service area population is in Clackamas and Washington Counties.

Table 3C. Core Service Area Population (2000)

County	Population of County	Portion of County Population in Core Service Area	Population in Core Service Area
Clackamas	338,391	91%	307,936
Marion	284,834	21%	59,815
Multnomah	660,486	25%	165,122
Washington	445,342	73%	325,100
Yamhill	84,992	41%	34,847
Total	1,814,045		892,819

Source: U.S. Census Bureau population by zip code.

Different components of aviation activity have been analyzed to estimate how Airport users are distributed among the five counties. The analysis resulted in the following rough estimates of Aurora State Airport use:

- 42% of aviation activity is associated with Clackamas County.
- 9% of aviation activity is associated with Marion County.
- 13% of aviation activity is associated with Multnomah County.
- 32% of aviation activity is associated with Washington County.
- 4% of aviation activity is associated with Yamhill County.

Based on these estimates, nearly three-quarters of the Airport's aviation activity is associated with Clackamas and Washington Counties. **Table 3D** shows the derivation of these estimates of aviation use

[12] The most recent population numbers broken down by zip code are from 2000.

by county. The "Licensed Pilots" column indicates the distribution of 2,995 licensed pilots whose mailing addresses have zip codes within the Airport's core service area. The "Population" column shows the distribution of population that is within the core service area by county, using Table 3C as the source. The "IFR Operations" column indicates the distribution of owners' mailing addresses for aircraft on IFR flight plans to or from Aurora State Airport from October 2007 through October 2009.

Table 3D. Aviation Activity Indicators Distributed by County

County	Licensed Pilots	Population	IFR Operations	Average
Clackamas	40%	34%	52%	42%
Marion	6%	7%	14%	9%
Multnomah	11%	18%	11%	13%
Washington	37%	37%	20%	32%
Yamhill	6%	4%	3%	4%
Total	100%	100%	100%	100%

Source: FAA Civil Aviation Registry, U.S. Census 2000, IFR arrival and departure data for October 2007 through October 2009 from GCR's Airport IQ Data Center.

All the five service area counties, except Marion, are in the seven-county Portland-Beaverton-Vancouver OR-WA Primary Metropolitan Statistical Area (PMSA).[13] Metro, the regional government for three Greater Portland counties, recently published aggregate population forecasts for the PMSA. Metro projects that the seven-county area will grow from 1.9 million people in 2000 to between 2.9 and 3.2 million by 2030. The growth rates these high and low forecasts represent are compared with other forecasts in **Table 3E**. The table shows that higher population growth is expected for the Portland metro region than for Oregon or the United States.

Regional population growth, particularly in-migration, varies with economic growth. However, the Portland metropolitan area no longer experiences wide swings in population due to its size and maturity. The population growth of the 1990s (2.4% per year on average) has slowed in the last decade to 1.7% per year. Future growth is expected to slow as birth rates slowly decrease and stabilize near the national average, life expectancies no longer rise as sharply as in the past, and migration trends change. Migration trends of the last century have favored movement from rural to metropolitan areas and to states on the west coast, gulf coast, and eastern seaboard; in some areas, an emerging trend is to move back to rural communities.[14]

[13] The seven counties are Clackamas, Columbia, Multnomah, Washington, and Yamhill in Oregon, and Clark and Skamania in Washington.

[14] Metro: 20 and 50 Year Regional Population and Employment Range Forecasts (April 2009 Draft)

Table 3E. Comparative Population Forecast Growth Rates, 2000 - 2030

Average Annual Growth	Geography of Forecast	Forecast Source
0.85%	United States	U.S. Census middle series (2004)
0.95%	United States	Global Insight (2008)
1.14%	Oregon	Global Insight (2008)
1.16%	Oregon	U.S. Census middle series (2004)
1.18%	Oregon	OR Office of Economic Analysis (2004)
1.28%	Portland metro region (3 counties)	OR Office of Economic Analysis (2004)
1.40%	Portland metro region (7 counties)	Global Insight Regional Service (2008)
1.37%	Portland metro region (7 counties)	Metro – low end of range (2009)
1.70%	Portland metro region (7 counties)	Metro – high end of range (2009)

Source: Metro: 20 and 50 Year Regional Population and Employment Forecasts, April 2009 Draft.

Since Metro's PMSA forecast did not distinguish individual counties, other sources were sought for county population forecasts. **Table 3F** shows historical and projected populations for the five counties in the Airport's service area. The highest growth since 1990 has been in Washington County, while the lowest growth has been in Multnomah County. Future populations forecast by the Oregon Office of Economic Analysis (OEA) and by Portland State University (for Marion County) show the highest growth rate in Washington County and the lowest in Multnomah County. In all five counties, future growth is expected to slow from the pace of the 1990s.

Applying the percentages of county populations in the Airport's core service area from Table 3C to the population projections in Table 3F results in an estimated Airport service area population of 1,407,579 in 2030. This shows considerable growth from the estimated 2000 service area population of 892,819. The average annual population growth in the core service area is 1.53% from 2000 to 2030, which is midway between the low (1.37%) and high (1.70%) rates that Metro forecast for the seven-county MSA.

Table 3F. Population History and Forecasts by County

	Clackamas County	Marion County	Multnomah County	Washington County	Yamhill County
1990	278,850	228,483	583,887	311,554	65,551
2000	338,391	284,834	660,486	445,342	84,992
2009	386,143	317,981	726,855	537,318	99,037
2030	536,123	410,431	800,565	788,162	141,505
			Average Annual Growth Rates		
1990-2009	1.73%	1.75%	1.16%	2.91%	2.20%
2000-2009	1.48%	1.23%	1.07%	2.11%	1.71%
2009-2030	1.57%	1.22%	0.46%	1.84%	1.71%

Source: For 1990, 2000, and estimated 2009 populations, U.S. Census Bureau. For 2030 forecast of Marion County, Portland State University forecast (Adopted by Marion County October 2009). For 2030 forecasts of other counties, Oregon Office of Economic Analysis, Department of Administrative Services, State of Oregon: Forecasts of Oregon's County Populations and Components of Change, 2000 - 2040 (Release: April 2004). The OEA's forecast for Marion County population in 2030 is 410,022.

Airport Service Area Economy

Air transportation use and aircraft ownership typically rises and falls with the airport service area economy. Aurora State Airport's core service area encompasses the diversity of Portland's urban economy, as well as the rural economies of northern Marion County and southern Clackamas County.

Although a recession officially began in December 2007, the Portland region's economy held steady until the fourth quarter of 2008, after the economic meltdown on Wall Street. Unemployment then rose rapidly. As of June 2010, the unemployment rate in the Portland-Vancouver-Hillsboro metropolitan area was 10.2%, down from 11.2% the previous year, but far above the 4.8% unemployment rate of 2007. Oregon's unemployment rate in June 2010 was 10.5%, down from 11.6% in June 2009. In comparison, the national unemployment rate was 9.5% in June 2010 and in June 2009.[15]

In 2009, Metro forecast employment in the PMSA. From 973,000 jobs in 2000, employment is projected to reach between 1.3 and 1.7 million in 2030. The low and high ranges for the forecast reflect average annual growth between 0.84% and 1.53%.[16] Nonfarm employment is projected to grow between 0.7% and 1.8% annually from 2008 to 2040. For manufacturing jobs, the employment forecast ranges from decline to slight growth. The highest job growth is projected for information services, business services, education and health services, and other/personal services.

Higher income often relates to higher levels of aircraft ownership, pilots per capita, and aircraft use. Higher income relates to more use of air transportation for business and more discretionary income for

[15] US Department of Labor, Bureau of Labor Statistics, http://www.bls.gov/home.htm.

[16] Metro: 20 and 50 Year Regional Population and Employment Range Forecasts (April 2009 Draft)

personal aviation use. **Table 3G** shows that the three most populous counties in the Airport service area have per capita incomes that exceed the U.S., Oregon, and Portland metropolitan area averages. Income projections for Oregon and the U.S. show declines in 2009, recovery to 2008 levels by 2010, and annual growth between 3.4% and 5.1% through 2017. Per capita income in Oregon is projected to stay below the average for the U.S. and to grow more slowly than in the U.S.as a whole.[17]

Table 3G. Per Capita Personal Income History (dollars)

Area Name	2000	2008	Average Annual Growth Rate 2000-2008
United States	30,318	40,166	3.58%
Oregon	28,718	36,365	3.00%
Clackamas County	37,212	44,803	2.35%
Marion County	25,038	32,565	3.34%
Multnomah County	33,122	41,222	2.77%
Washington County	33,942	40,188	2.13%
Yamhill County	24,420	32,700	3.72%
Portland Metropolitan Area	32,779	39,942	2.50%

Source: U.S. Department of Commerce, Bureau of Economic Analysis, www.bea.gov/regional/reis/drill.cfm

BASED AIRCRAFT FORECAST

The based aircraft forecast begins by presenting historical numbers of based aircraft. Then, various forecast models prepared for the Airport are analyzed and the preferred forecast for based aircraft and fleet mix through 2030 is presented.

Records of the numbers and types of aircraft based at the Airport back to 1998 appear in **Table 3H**. The numbers through 2009 were taken from the TAF, which relies on airport owner-reported estimates on periodically updated Airport Master Records (FAA 5010 forms). Oregon's aircraft registration requires an airplane owner to designate where the airplane is based, and ODA has used these registration logs to determine the based aircraft at the Airport. ODA validated the number of based aircraft for 2010 with the FAA's Civil Aviation Registry, Airport tenants, and hangar inspections.

Table 3H shows that the number of aircraft based at the Airport grew steadily through 2007 then declined in 2008 and 2009, increasing again in 2010. In 2007, the FAA launched a nationwide program to inventory based aircraft by their unique "N" numbers. The FAA contended that many of the "N" numbers reported for Aurora State Airport were also reported at other airports. The result was a

[17] Oregon Economic and Revenue Forecast, June 2010, Volume XXX, No. 2, prepared by Office of Economic Analysis, and U.S. Department of Commerce, Bureau of Economic Analysis, www.bea.gov/regional/reis/drill.cfm

decrease of 76 aircraft reported for Aurora State Airport between 2007 and 2008. Nevertheless, from 1998 through 2010 based aircraft grew at a 3.6% average rate. Jet aircraft grew at the highest annual rate, 15.3%, while the number of helicopters declined at a 1.5% average annual rate. Single engine aircraft have always dominated the based aircraft fleet, accounting for 74% in 2010.

Table 3H. Historical Based Aircraft at Aurora State Airport

Year	Single Engine	Jet	Multi-Engine	Helicopter	Other	Total
1998	175	4	22	30	2	233
1999	175	4	22	30	2	233
2000	193	5	30	35	2	265
2001	319	7	27	34	0	387
2002	319	7	27	34	0	387
2003	323	7	27	34	0	391
2004	319	7	27	34	0	387
2005	319	7	27	34	0	387
2006	322	5	66	27	1	421
2007	322	33	38	27	0	420
2008	276	14	30	24	0	344
2009	258	12	30	24	0	324
2010	261	23	40	25	5	354

Source: FAA Terminal Area Forecast, December 2010 for 1998 through 2009. ODA registration records for 2010.

It appears the number of aircraft jumped up when the Southend Airpark opened. Southend Airpark's increased hangar capacity and expansion of aircraft services may have led to the Airport gaining a greater share of regional aviation activity. **Table 3I** illustrates the change in market share. It provides based aircraft history for four airports with comparable facilities and services to the Airport. These four airports are located at the edges of Aurora State Airport's maximum service area—Hillsboro Airport, Troutdale Airport, McMinnville Municipal Airport, and McNary Field in Salem. These airports have roughly comparable runway length, runway strength, instrument approach capability, and services that make them "business jet-capable."[18] Other airports in the region are used almost exclusively by single engine and multi-engine piston aircraft and generally do not have the features needed or desired for business jets.

[18] Portland International Airport is capable of handling business jets and has based general aviation aircraft, but its role as a medium-hub commercial service airport constrains its use for general aviation. Consequently, it is excluded from the analysis.

Between 1998 and 2009, Aurora State Airport's market share of based aircraft grew from 21% to 30%. Two of the other airports lost market share and two increased slightly. Aurora State Airport gained in its share of single engine, jet, and multi-engine aircraft. The Airport's share of helicopters and other aircraft declined from 1998 to 2009.

Table 3I. Change in Based Aircraft Market Shares at "Jet-Capable" Airports

Year	Aircraft Type	Aurora	Hillsboro	Troutdale	McMinnville	McNary (Salem)	Total Based Aircraft
1998	Single engine	175 (21%)	288 (34%)	149 (18%)	76 (9%)	148 (18%)	836 (100%)
	Jet	4 (11%)	24 (69%)	2 (6%)	1 (3%)	4 (11%)	35 (100%)
	Multi-Engine	22 (18%)	60 (48%)	20 (16%)	5 (4%)	17 (14%)	124 (100%)
	Helicopter	30 (46%)	18 (28%)	5 (8%)	10 (15%)	2 (3%)	65 (100%)
	Other	2 (3%)	0 (0%)	1 (2%)	18 (31%)	38 (64%)	59 (100%)
	Total	233 (21%)	390 (35%)	177 (16%)	110 (10%)	209 (18%)	1,119 (100%)
2009	Single engine	258 (33%)	145 (19%)	129 (17%)	88 (11%)	153 (20%)	773 (100%)
	Jet	12 (18%)	38 (56%)	2 (3%)	5 (7%)	11 (16%)	68 (100%)
	Multi-Engine	30 (28%)	30 (28%)	14 (13%)	11 (11%)	21 (20%)	106 (100%)
	Helicopter	24 (25%)	40 (42%)	9 (9%)	11 (12%)	11 (12%)	95 (100%)
	Other	0 (0%)	0 (0%)	0 (0%)	17 (46%)	20 (54%)	37 (100%)
	Total	324 (30%)	253 (24%)	154 (14%)	132 (12%)	216 (20%)	1,079 (100%)

Source: FAA Terminal Area Forecast, December 2010.

While some aircraft may have relocated from the Hillsboro and Troutdale Airports to Southend Airpark at Aurora, this was not likely the only cause of the market shift. The removal of hangars at other airports in the region may have contributed to the gain in the Airport's market share. In 2008, Portland International

Airport removed 18 hangars for a road improvement project. Since 2001, the following private airports have closed in the region: Basl Hill Farms Airstrip, Bonney Acres, Clackamas Heights, Cup Port, Hayden Mountain, McGill, Myers, and Pat's Pasture. Farther away in Vancouver, Washington, the privately owned Evergreen Field, with up to 165 aircraft, closed in 2006.

For the 1998 through 2009 period, Aurora's average annual growth rate was the highest of the five airports (3.0%), followed by McMinnville (1.7%), Salem, (0.3%), Troutdale (-1.3%), and Hillsboro (-3.9%). Combining the five airports, the number of based aircraft declined at an average annual rate of 0.3% between 1998 and 2009. The highest rate of decline was for other aircraft (-4.2%). On average, multiengine aircraft declined 1.4% annually and single engine aircraft declined 0.7% annually. In contrast, jets and helicopters increased – at 6.2% and 3.5% average annual growth rates, respectively.

The overall decline in based aircraft may be due to slow recovery from the economic recession or the relocation of single engine and multi-engine aircraft to airports that are not "jet-capable." Overestimated 1998 numbers or underreported 2009 numbers may also account for the decline. The FAA's based aircraft inventory in 2007 generally found overestimated numbers at airports across the country. However, since the FAA performed its based aircraft inventory in 2007, updating that database has depended on airport owners doing so voluntarily.

Socioeconomic changes often result in changes in the number of based aircraft at an airport. The population within the Airport service area has grown. Employment and income also grew until the recession hit the region hard in late 2008. However, very low statistical correlation[19] was found between historical based aircraft numbers at Aurora State Airport and the historical population, employment, or income statistics of the service area. The Airport's abrupt change in market share due primarily to the Southend Airpark development is probably the reason based aircraft numbers do not correlate with socioeconomic data.

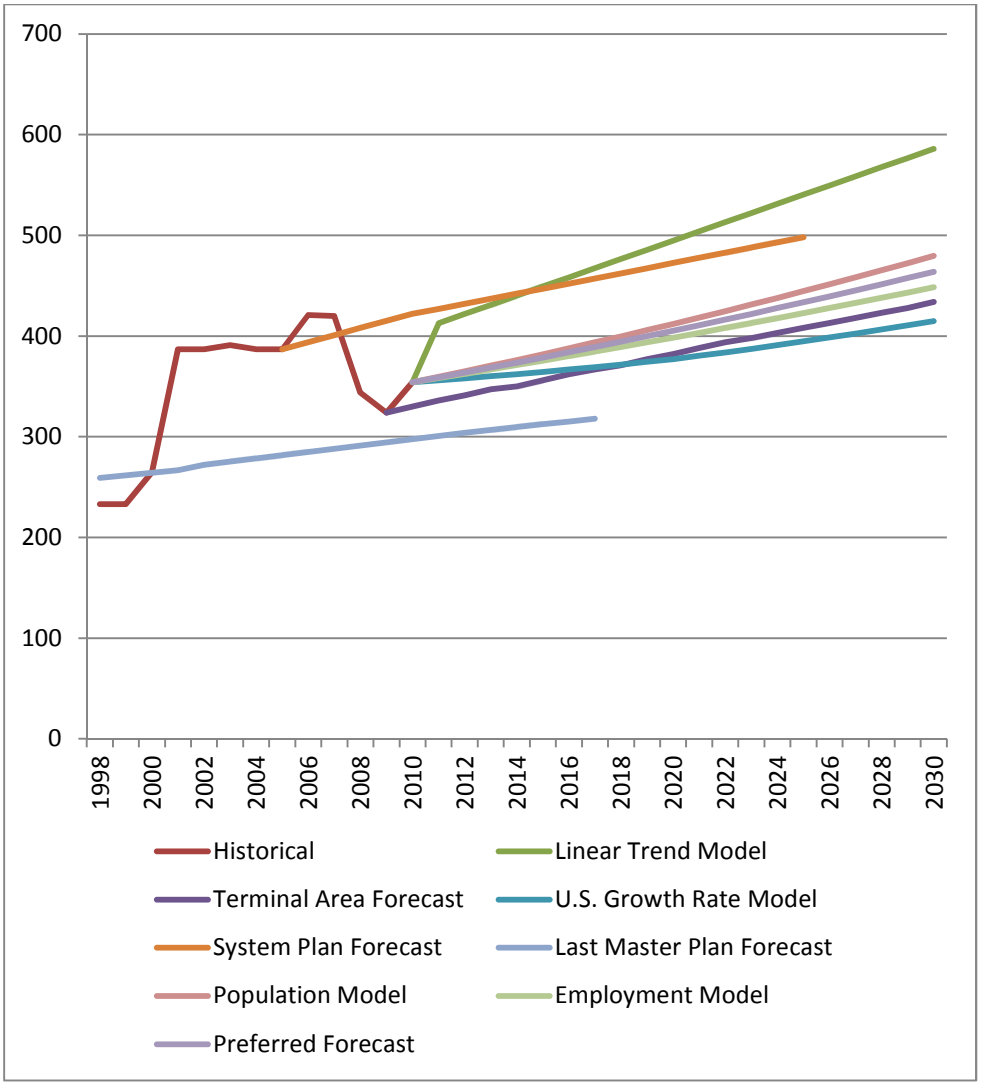
Although the historical relationship between aviation activity and socioeconomic variables cannot be used for linear regression forecasting of activity at the Airport, other forecasting models can be used. Trend analysis is a linear regression model that relies on projecting past trends into the future. In trend analysis, a regression equation uses time as the independent variable. Market share modeling assumes an airport will retain its share of the national or state market in the future, relying on forecasts prepared for the nation or state to determine the forecast for an individual airport.

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[19] Regression analysis is often used to forecast aviation activity. In regression analysis, the value being estimated (or forecast)—the dependent variable—is related to other variables—the independent or explanatory variables—that "explain" the estimated value. An example of a regression equation is to estimate based aircraft as a function of economic variables. The relationship is estimated using historic data for the independent and dependent variables. The explanatory power of the equation is measured by the R^2 statistic (called the coefficient of determination). An R^2 of 0 indicates that there is no statistical relationship between changes in the independent and dependent variables. R^2 values near 1.0 mean that there is a very strong statistical relationship. The R^2 values for Aurora State Airport based aircraft and regional population, income, and employment were less than 0.3.

Exhibit 3E shows the range of five forecast models and three other forecasts that were considered for the Aurora State Airport based aircraft forecast. They are described after the exhibit.

Exhibit 3E. Comparison of Based Aircraft Forecasts



U.S. Growth Rate Model (0.80% Annual Growth).

This is a market share model because it assumes that each type of aircraft at the Airport will retain its current share of the national market. Growth rates from the FAA's March 2010 forecasts were applied to the Airport's current fleet mix. The result is an average annual increase of 0.80% from 2010, to 415 aircraft in 2030. Growth in the first ten years is higher than in the last ten years of the forecast. The highest forecast growth rate is for jets (4.25%), followed by helicopters (3.0%), other aircraft (2.25%), multi-engine (0.65%, averaging the rates for multi-engine piston and turboprop aircraft), and single engine (0.05%). The composition of the 2030 fleet projected by this model is 264 single engine aircraft, 53 jets, 46 multi-engine aircraft, 45 helicopters, and 8 other aircraft. The drawback of this model is that

the Airport's history has been to grow at a much higher rate than the nation as a whole. Population in the service area is also projected to grow at a higher rate than the U.S. population.

Linear Trend Model (2.55% Annual Growth).

This forecast model analyzes historical growth from 1998 through 2010 and continues that growth trend into the future. The result is an average annual growth rate of 2.55%, resulting in a projection of 586 based aircraft in 2030. From 2010 to 2030, single engine aircraft grow to 457 at 2.85% per year, jets grow to 48 at 3.76% per year, multi-engine aircraft grow to 69 at 2.75% per year, helicopters decline at 4.34% per year to 100, and other aircraft decline at 6.85% per year, to 1. The problem with this model is that the Airport's growing share of the regional market is likely to slow, and it is unlikely that all aircraft types will grow according to the historical trends. The model's strong growth in single engine aircraft and decline in helicopters opposes state and national trends. The decline in helicopters is also inconsistent with the fact that a new helicopter business is planning to operate from the Airport soon.

Population Model (1.53% Annual Growth).

While the historical based aircraft data did not correlate with historical population, both based aircraft and population in the service area increased between 1998 and 2010, showing they are moving in the same direction. The annual growth rate projected for the core service area population, 1.53%, is used to forecast 480 based aircraft in 2030.

Employment Model (1.19% Annual Growth).

Historical numbers of based aircraft did not correlate any better with employment data than with population. However, employment is usually a factor in based aircraft growth and decline. A 1.19% annual growth rate, the average of the high and low ranges of Metro's 2030 employment forecast, resulted in growth to 448 aircraft in 2030.

Terminal Area Forecast (1.40% Annual Growth).

The FAA's Terminal Area Forecast projects that based aircraft will grow to 424, reflecting 1.4% average annual growth from 2009 to 2030. Jet aircraft are forecast to grow at the highest rate, 6.93%, while multi-engine aircraft are projected to remain unchanged. The composition of the 2030 fleet according to the Terminal Area Forecast is 321 single engine aircraft, 49 jets, 30 multi-engine aircraft, and 34 helicopters.

System Plan Forecast (1.27% Annual Growth).

The *Oregon Aviation Plan 2007* used 2005 as the base year, when the Airport's based aircraft totaled 387. It projected yearly growth at 1.27% to 498 aircraft in 2025.

Last Master Plan Forecast (1.09% Annual Growth).

The 2000 Aurora State Airport Master Plan projected 1.09% annual growth in the number of based aircraft, from 259 in 1998 to 318 in 2017. This forecast was constrained, based on ODA's decision not to expand the Airport to serve a more demanding critical aircraft. An unconstrained forecast projected growth to 345 aircraft in 2017. The constrained and unconstrained forecasts for 2017 were reached by 2001.

Preferred Forecast (1.36% Annual Growth).

The preferred forecast uses the average of the growth rates in the Population and Employment Models, 1.36% per year, so that based aircraft reach 464 in 2030. The Preferred Forecast falls in the mid-range of the other forecasts and models. It is higher than national forecasts, but in line with growth projected by Airport businesses, between 1% and 3% per year over the next 20 years. While the Airport may experience a spurt in based aircraft resulting from additional landside development, the other comparable airports (Hillsboro, Troutdale, and McNary Field in Salem) may also expand to meet metropolitan area demand. The preferred forecast assumes it is more likely that Aurora State Airport will maintain its share of regional based aircraft than gain market share as it did in the last decade.

Table 3J presents the based aircraft forecast and fleet mix. The fleet mix was determined by averaging the fleet mixes of the Linear Trend and US Growth Rate Models, and then adjusting primarily the single engine and helicopter shares. The single engine share was lowered slightly and the helicopter share raised, to be more in line with expectations for the Airport. Multi-engine aircraft were divided between turboprop and piston, with turboprop aircraft growing faster than multi-engine piston aircraft. The resulting annual growth rates from 2010 to 2030 differ by aircraft type: 3.7% for jets, 2.6% for turboprop, 0.6% for multi-engine piston, 1.0% for single engine, 2.8% for helicopter, and 0.0% for other.

Table 3J. Based Aircraft and Fleet Mix Forecast

Year	Jet	Turboprop (Multi-engine)	Multi-engine Piston	Single Engine	Helicopter	Other	Total
2010	23	16	24	261	25	5	354
2015	27	19	24	276	28	5	379
2020	33	20	25	288	34	5	405
2030	47	26	27	316	43	5	464
				Fleet Mix			
2010	6%	5%	7%	74%	7%	1%	100%
2015	7%	5%	6%	73%	8%	1%	100%
2020	8%	5%	6%	71%	9%	1%	100%
2030	10%	6%	6%	68%	9%	1%	100%

Source: WHPacific, Inc.

The fleet mix is projected to shift over the 20-year forecast period, consistent with trends the FAA has projected nationally. Single engine aircraft remain predominant at the Airport, but decline from 74% to 68% over the next 20 years. The proportion of jets and helicopters increases over the planning period, while the proportion of total multi-engine aircraft stays about the same, with some shifting between the multi-engine turboprop and multi-engine piston shares.

AIRCRAFT OPERATIONS FORECAST

This section begins with a review of historical trends in aircraft operations. Previous aircraft operations forecasts are reviewed and the preferred aircraft operations forecast is explained and presented. The operations forecasts include total annual operations, local vs. itinerant operations, operational fleet mix, and peak activity.

Aircraft operations are difficult to measure at a non-towered airport. Research into the problem has concluded that the most accurate and cost-effective way to estimate aircraft operations at a non-towered airport is to sample traffic with an acoustical counter for two weeks for each of the four seasons and extrapolate that sample into an annual estimate.[20] However, acoustical counters can provide false readings from other sounds, miss landings and takeoffs at mid-field by quiet aircraft, and are less reliable for helicopters than fixed wing traffic when helicopters can use multiple takeoff and landing locations and routes.

From 1979 through 2003, ODA's Aircraft Traffic Monitoring Program employed acoustical counting to estimate the levels of annual aircraft operations at Oregon airports. No acoustical samples have been taken since 2003, and combined with the inherent flaws associated with this method, it has been determined that the FAA's Terminal Area Forecast is the best source of historical aircraft operations for the Airport. The Terminal Area Forecast reports periodically updated Airport Master Record estimates provided by ODA.

Table 3K shows the history of operations from 1998 to 2009. Operations peaked at 90,180 in 2000. Their decline to 72,895 in 2001 may be attributed to 9/11. Since 2001, operations have increased slowly to 89,495 in 2009, the last year of historical estimated operations records according to the Terminal Area Forecast.

The composition of operations has not varied substantially from 1998 through 2009. Air taxi (FAR Part 135) operations stayed close to 11% of total operations. Military operations remained a very small portion of total operations, and all military operations were itinerant. The split of GA aircraft operations between itinerant and local varied a bit more. Local operations ranged between 41% and 56% of total GA operations, averaging 45%.

[20] Transportation Research Board, Airport Cooperative Research Program, ACRP Synthesis 4: Counting Aircraft Operations at Non-Towered Airports (2007).

Table 3K. Historical Aircraft Operations at Aurora State Airport

Year	Air Taxi	GA Itinerant	Military Itinerant	Total Itinerant	GA Local	Total Local	Total Operations
1998	8,791	34,650	180	43,621	23,200	23,200	66,821
1999	8,791	34,650	180	43,621	23,200	23,200	66,821
2000	9,000	36,000	180	45,180	45,000	45,000	90,180
2001	6,190	39,475	250	45,915	27,980	27,980	73,895
2002	9,227	39,713	250	49,190	29,402	29,402	78,592
2003	9,325	39,951	250	49,526	30,824	30,824	80,350
2004	9,422	40,188	250	49,860	32,208	32,208	82,068
2005	9,520	40,426	250	50,196	33,628	33,628	83,824
2006	9,431	39,965	250	49,646	34,064	34,064	83,710
2007	9,564	41,176	250	50,990	34,892	34,892	85,882
2008	9,656	41,409	250	51,315	36,030	36,030	87,345
2009	9,788	42,592	250	52,630	36,865	36,865	89,495

Source: FAA Terminal Area Forecast, December 2010.

One method for forecasting aircraft operations at GA airports is to apply a ratio of operations per based aircraft (OPBA) to the based aircraft forecast. For each year in the forecast, operations equal the forecast number of based aircraft multiplied by an OPBA ratio. Some of the operations in an OPBA ratio are by based aircraft and some are by transient, or itinerant, aircraft. The FAA has provided the following guidelines for OPBA ratios:[21]

- 250 OPBA is typical at a rural GA airport with little itinerant traffic.
- 350 OPBA is typical at a busier GA airport with more itinerant traffic.
- 450 OPBA is typical at a busy reliever airport with a large amount of itinerant traffic.

The historical OPBA ratio for Aurora State Airport averages 240 per year,[22] varying from a high of 340 in 2000, to a low of 191 in 2001. In 2009, the OPBA was 276. For comparison, an OPBA ratio was extracted from the Airport user survey that was conducted as part of this Master Plan, in the fall of 2009. The survey asked airport owners and operators to estimate their annual number of landings. Information for fixed wing aircraft varied from 30 annual landings (about once every two weeks) to 300 annual landings (nearly once a day) per aircraft. The average per fixed wing aircraft was approximately 145 landings, which equates to 290 annual operations. The survey results covered a variety of aircraft

[21] FAA Order 5090.3C, Field Formulation of the National Plan of Integrated Airport Systems (NPIAS)

[22] The number changed from the earlier forecast because three years of based aircraft numbers were lowered, which increased the ratio of operations per based aircraft for those years. Also, an additional year of operations was available.

types, from small single engine piston aircraft to mid-sized business jets. For helicopters, the number of landings per aircraft was much higher, up to 1,500 per year; however, 70% to 90% of the landings are not at the Airport. This illustrates the difference in how helicopters operate, compared to fixed wing aircraft.

The Airport has a lower OPBA than Hillsboro, McMinnville, Troutdale, and McNary Field in Salem. These other airports are located in the same region and, except for McMinnville, have more reliable records of aircraft operations because they have air traffic control towers. The average OPBA ratios for these airports from 1998 to 2008 are as follows:

- Hillsboro 639 OPBA
- McMinnville 592 OPBA
- Troutdale 419 OPBA
- Salem 411 OPBA

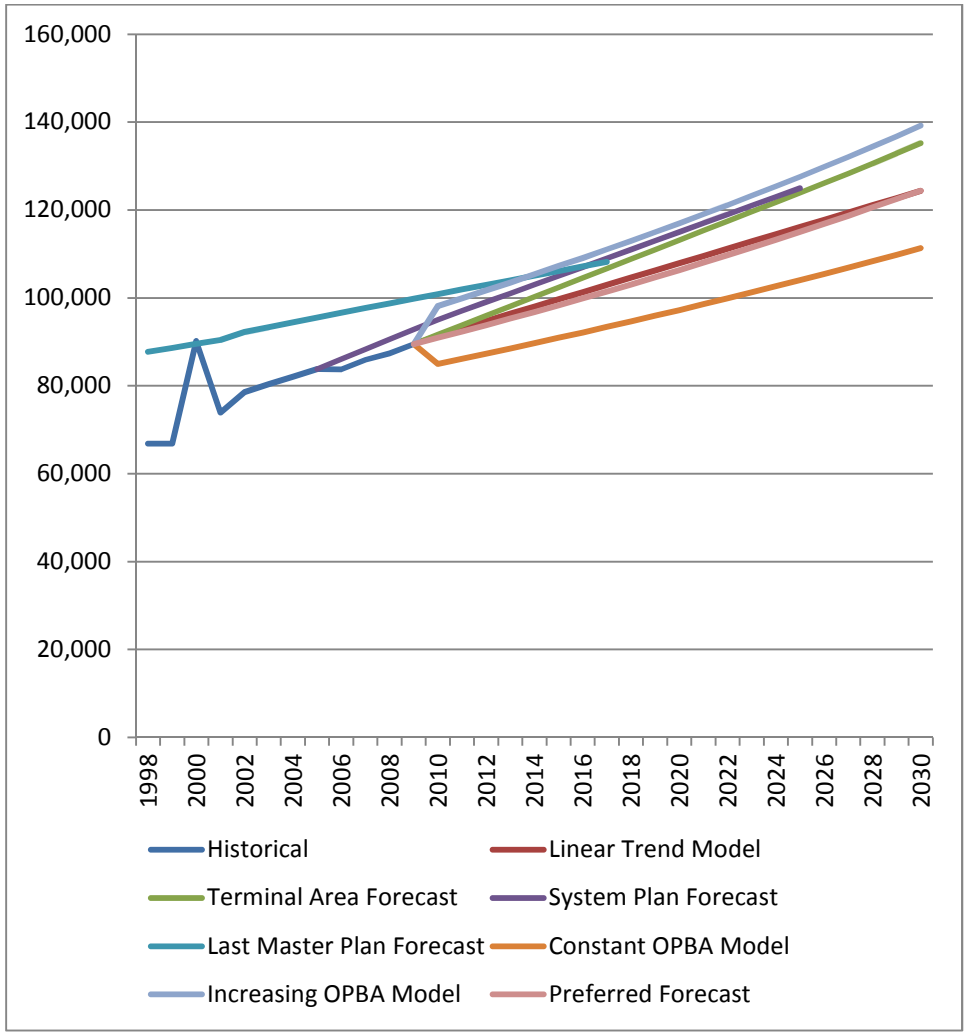
Aurora State Airport's lower OPBA ratio is probably due to a combination of factors, including a lower proportion of local operations (less flight training that entails a high number of touch-and-go operations per aircraft) and a large number of small aircraft that are flown infrequently.[23]

When an OPBA ratio is used for forecasting, the OPBA might be held constant over the forecast period, or it might increase over the forecast period. The projection of an increase in OPBA would be supported by the national trend and FAA's national forecasts over the last several years for increasing aircraft utilization. Put another way, GA and air taxi aircraft hours flown have been increasing faster than the active aircraft fleet, and the FAA has been forecasting higher growth rates for hours flown than for aircraft. Longer trips might account for some of the increase in hours flown, but most of the higher utilization translates to more trips per aircraft. More trips mean more takeoffs and landings per aircraft.

Forecast models for aircraft operations that used the OPBA model and those that did not were considered. **Exhibit 3F** compares the various forecast models and previous forecasts of aircraft operations at the Airport, which are described after the exhibit.

[23] The Airport user survey found many smaller piston airplanes are flown less than once a week, or less than 100 operations per year.

Exhibit 3F. Comparison of Aircraft Operations Forecasts for Aurora State Airport



Linear Trend Model (1.58% Annual Growth).

This model analyzes historical growth from 1998 through 2009 and continues that growth trend into the future. The result is an average annual growth rate of 1.58%, resulting in a projection of 124,347 operations in 2030. By 2030, the OPBA is 268.

Terminal Area Forecast (1.99% Annual Growth).

The FAA's Terminal Area Forecast projects that operations will grow to 135,240 in 2030, reflecting 1.99% average annual growth from 2009 to 2030. By 2030, the OPBA is 312.

System Plan Forecast (2.02% Annual Growth).

The *Oregon Aviation Plan 2007* used 2005 as the base year, when Aurora State Airport's aircraft operations totaled 83,824. It projected yearly growth at 2.02% to 124,978 operations in 2025. The OPBA ratio grew over the forecast period, from 217 to 251.

Last Master Plan Forecast (1.11% Annual Growth).

The 2000 Aurora State Airport Master Plan projected 1.11% annual growth in aircraft operations, from 87,714 in 1998 to 108,204 in 2017. The forecast was prepared by using a constant 339 OPBA ratio.

Constant OPBA Model (1.05% Annual Growth).

This model uses the average OPBA from the 1998 to 2009 period, 240. In 2030, aircraft operations reach 111,360, representing 1.05% average annual growth rate from 2009 to 2030. Since the OPBA in 2009 was 276, higher than the 11-year average, the resulting growth rate is slightly lower than the growth rate of the based aircraft forecast. This is inconsistent with the trend for higher aircraft utilization.

Increasing OPBA Model (2.13% Annual Growth).

This model follows the FAA's national forecast for higher aircraft utilization. Over the forecast period, the OPBA ratio is increased to 300. The resulting projection of aircraft operations in 2030 is 139,200, and the average annual growth rate is 2.13%.

Preferred Forecast (1.58% Annual Growth).

The preferred forecast uses the same growth rate as the linear trend[24]. In 2030, aircraft operations reach 124,386, representing 1.58% average annual growth rate from 2009 to 2030. The Preferred Forecast falls in the mid-range of the other forecasts and models. The growth rate is slightly higher than the growth rate of the based aircraft forecast, which is consistent with the trend for higher aircraft utilization. Over time, the OPBA ratio increases to reach 268 in 2030.

Table 3L distributes the preferred forecast for aircraft operations among the categories that the FAA uses for aircraft operations. Air taxi operations remain 11% of total aircraft operations. The split between GA itinerant and local operations is 60% itinerant and 40% local through the planning period. Compared to historical proportions of itinerant and local operations, future local operations are a smaller portion, which reflects the expectation of lessening flight training at the Airport. Itinerant military operations remain constant, and, consistent with the past, there are no local military aircraft operations in the forecast.

[24] The previous operations preferred forecast used the constant OPBA model (1.9% average annual growth rate) from the 1998 to 2008 period. This update took a fresh look at the models and determined this model is no longer appropriate, as it is yields an average annual growth rate inconsistent with trends expected at the Airport and nationwide.

Table 3L. Aircraft Operations Forecast

Year	Itinerant Air Taxi	Itinerant GA	Itinerant Military	Total Itinerant	Local GA	Total Operations
2009 Historical	9,788	42,592	250	52,630	36,865	89,495
2010 Estimated	10,000	48,395	250	58,645	32,264	90,909
2015	10,815	52,354	250	63,419	34,902	98,321
2020	11,697	56,635	250	68,582	37,756	106,338
2030	13,682	66,272	250	80,205	44,181	124,386

Source: WHPacific, Inc., except Terminal Area Forecast for 2009.

Operations Fleet Mix Forecast

Because aircraft operations include those by transient aircraft as well as those by based aircraft, the operational fleet mix for the Airport is not the same as the based aircraft fleet mix (Table 3J). Since it is a non-towered airport, the operational fleet mix for the Airport must be estimated. IFR traffic records help with the estimate, although IFR operations account for a small portion of the total Airport traffic, and higher performance (turbine-powered) aircraft are disproportionately represented in the IFR traffic. The Airport users surveyed reported higher utilization for jets and turboprops than for piston airplanes.[25] Local operations are predominantly for training, and are reportedly dominated by piston aircraft and helicopters.

National data confirm that business jet aircraft are used more often than piston aircraft. Tables 3A and 3B show that piston aircraft are flown 83 hours per year and jet aircraft are flown 252 hours per year on average. Consequently, jets have a greater share of the operations at the Airport than their share of based aircraft. In addition, since Aurora State Airport is "jet-capable," and most of the 46 other airports in the service area are not, the Airport will be used more by transient jet aircraft than most of the other airports.

Using this information and considering national growth rates for hours flown, the operations fleet mix forecast was prepared (**Table 3M**). Piston-powered airplanes are projected to have a declining share of total operations, while jet, turboprop, and helicopter traffic have growing shares.

[25] For the 86 aircraft with use estimates in the user survey results, helicopters have the highest utilization—up to 1,500 operations per year per helicopter, although 70% to 90% of those operations are not at Aurora State Airport. The jets in the survey are used nearly 600 operations per year per aircraft. Piston aircraft have the lowest utilization, 60 to 150 operations per year.

Table 3M. Operations Fleet Mix Forecast

Year	Jet	Turboprop	Multi-engine Piston	Single Engine	Helicopter	Total Operations
2010	10,909	9,091	8,182	35,455	27,273	90,909
2015	12,782	10,815	7,866	35,396	31,463	98,321
2020	15,951	11,697	7,444	37,218	34,028	106,338
2030	22,389	14,926	8,707	37,316	41,047	124,386
			Fleet Mix			
2010	12%	10%	9%	39%	30%	100%
2015	13%	11%	8%	36%	32%	100%
2020	15%	11%	7%	35%	32%	100%
2030	18%	12%	7%	30%	33%	100%

Source: WHPacific, Inc.

Peak Aircraft Operations Forecast

As airport activity fluctuates from month to month, day to day, and hour to hour, airside and landside facilities should be designed to accommodate peak levels of use. The forecast of annual aircraft operations serves as the basis for generating forecasts of peak demand. Peak demand is usually expressed as "Peak Month" (the month in a calendar year when the highest level of activity occurs), "Design Day" (the average daily level of activity during the Peak Month), and "Design Hour" (the busiest hour within the Design Day).

Peak demand forecasts at the Airport are based on assumptions that consider the following:

- Peaking characteristics determined from fuel sales and IFR flight plan data
- Guidance regarding peak demand from FAA Advisory Circular 150150/5060-5, *Airport Capacity and Delay*

Historical fuel sales and IFR operations records are available by month. They indicate that May through September is typically the busiest time at the Airport, and the winter months are the slowest time. The single busiest month varies from year to year, but for both fuel and IFR activity, the busiest month accounts for 11% of the annual total, on average.

The Design Day is the average day of the Peak Month, calculated by dividing Peak Month operations by 30.5 days. Based on FAA guidance for the Airport's mix of aircraft, the Design Hour is estimated to contain 11% of the Design Day operations.[26] **Table 3N** presents the resulting peak demand forecasts for Aurora State Airport.

[26] FAA Advisory Circular 150/5060-5, Airport Capacity and Delay, Table 2-1.

Table 3N. Peak Operations Forecast

Year	2010	2015	2020	2030
Annual	90,909	98,321	106,338	124,386
Peak Month	10,000	10,815	11,697	13,682
Design Day	328	355	384	449
Design Hour	36	39	42	49

Source: WHPacific, Inc.

CRITICAL AIRCRAFT AND AIRPORT REFERENCE CODE

According to FAA criteria, an airport's design is based on the characteristics of the critical aircraft, which is the most demanding aircraft that uses the airport "regularly" or "substantially." The FAA defines regular or substantial use as at least 500 annual itinerant operations. The Airport Reference Code (ARC) is the main criterion for determining applicable FAA airport design standards for dimensions such as runway and shoulder widths; separations of runways, taxiways, and taxilanes; and cleared areas. The Aircraft Approach Category and the Airplane Design Group of the critical aircraft define the ARC. The Aircraft Approach Category is determined by the approach speed, or 1.3 times the stall speed of the aircraft in its landing configuration at its maximum landing weight. The letters A, B, C, D, and E. represent the Aircraft Approach Category. The Airplane Design Group of the aircraft is based on the wingspan or tail height, and is defined by Roman numerals I, II, III, IV, V and VI. **Table 3O** shows the ARC component definitions and typical aircraft that meet these definitions.

According to the 2000 Airport Master Plan, the planned ARC was B-II, exemplified by the King Air turboprop and the Cessna Citation jet. At that time, ODA decided to constrain the forecast by keeping the airfield ARC at B-II. A runway designed for ARC B-II is adequate for about 45% of the business jets manufactured.[27]

[27] Central Region FAA Newsletter, October 2001.

Table 3O. Airport Reference Code (ARC) Components

Approach Category	Approach Speed	Typical Aircraft
A	Less than 91 knots	Cessna 150, 172, 206, Beech Bonanza
B	91 to 120 knots	King Air, Piper Navajo, Gulfstream I
C	121 to 140 knots	Boeing 727, 737, Learjet, Challenger
D	141 to 165 knots	Boeing 747, Gulfstream V
Airplane Design Group	**Wingspan**	**Typical Aircraft**
I	Less than 49 feet	King Air, Cessna 150, 172, 206, Gates Learjet, Beech Bonanza
II	49 to 78 feet	King Air, Super King Air, Cessna Citation, Dassault Falcon, Gulfstream I, Challenger
III	79 to 117 feet	Boeing 727, 737, DC-3, DC-6, Gulfstream V
Airplane Design Group may be determined by tail height, if more demanding than wingspan:		
Airplane Design Group		**Tail Height**
I		Less than 20 feet
II		20 to 29 feet
III		30 to 44 feet

Source: FAA AC 150/5300-13, Airport Design

Note: Aircraft Approach Category E (166 knots or more) and Airplane Design Groups IV, V, and VI (118 feet or more) are not shown.

The Airport has now passed the 500 operations threshold for Aircraft Approach Category C, so the current ARC should be C-II. To prove this, **Table 3P** presents the distribution of documented[28] jet aircraft operations by ARC for FY 2007 and FY 2009. The two years represent recent peak and valley years, neither of which is typical of activity at the Airport. The peak year (2007) was the boom time immediately preceding the recession, and the valley year (2009) was the deepest part of the recession. The average of the two years reflects activity in a more normal year. The source of this information is IFR flight plan records. Undocumented VFR jet operations are not included in the table, nor are the many turboprop and piston aircraft operations that fall in Approach Categories A or B and in Airplane Design Groups I or II.

[28] Documentation is from IFR flight plans filed. They were reviewed, and VFR operations required to make trips whole were added. For example, if an individual aircraft's IFR record showed a flight from Aurora State to another airport, and its next sequential IFR operation originated at Aurora State, a VFR operation was added to bring the aircraft back to Aurora State for the next flight. One Flight Operations Director at the Airport confirmed that IFR clearance is sometimes obtained after VFR departure or cancelled prior to arrival, to save time.

Table 3P. Documented Jet Operations by Airport Reference Code

ARC	FY 2007	FY 2009	Average
B-I	689	273	481
B-II	883	785	834
B-III	0	4	2
C-I	293	209	251
C-II	406	181	293
C-III	2	0	1
D-I	8	0	4
D-II	2	2	2
D-III	0	2	1
Unknown or Other ARC	59	64	62
Total	2,342	1,520	1,931

Source: Derived from IFR flight plan data (Detailed GA Activity and Airline reports) obtained from GCR's Airport IQ Data Center. Note: during the update, more research was done to identify ARCs for the "Unknown" aircraft, which increased the number of B-I, B-II and C-II aircraft operations.

The Cessna Citation is the most prevalent jet aircraft represented in the documented operations and in the based aircraft fleet. In the FY 2007 data, the Cessna 525 Citation (ARC B-I, 10,400 pounds maximum takeoff weight) is predominant. In the FY 2009 data, the Cessna 560 Citation (ARC B-II, 16,300 pounds maximum takeoff weight) is predominant. Other models of the Cessna Citation[29] account for large numbers of operations at the Airport, along with the Dassault Falcon 900[30] and the Israel Aircraft Industries (IAI) Westwind 1124[31] and Astra 1125.[32]

Aircraft Approach Category C accounts for 701 documented operations in FY 2007 and 390 in FY 2009, resulting in an average of 545 operations. The number of Aircraft Approach Category D airplane operations is negligible, as are operations in Airplane Design Group III.

With more than 500 operations in Aircraft Approach Category C and more than 500 operations in Airplane Design Group II, the appropriate ARC for the Airport is C-II. With based jet aircraft and jet aircraft operations projected to grow at rates over 3% per year, the ARC is not likely to grow from

[29] ARC B-I and B-II, maximum takeoff weights up to 24,000 pounds
[30] ARC B-II, 45,500 pounds maximum takeoff weight
[31] ARC C-I, 23,500 pounds maximum takeoff weight
[32] ARC C-II, 23,500 pounds maximum takeoff weight

Aircraft Approach Category C to D or from Airplane Design Group II to III. Aurora State Airport meets many of the ARC C-II design criteria now, as the next chapter will show.

The current and forecast ARC is C-II, which reflects a family of business jets. The critical aircraft is the aircraft in ARC that uses the Airport the most. The current critical aircraft is the IAI Astra 1125. A runway designed for ARC C-II would be adequate for about 90% of the business jets manufactured.[33] In Table 3P, the Astra accounted for the largest number of C-II operations. An aircraft based in Eugene accounted for most of the Astra operations, and operations by Astra aircraft based elsewhere in Oregon and in California were also recorded. An Astra was recently based at the Airport.

In the future, a newer model of ARC C-II business jet, the Cessna Citation X, is projected to overtake the Astra as the predominant C-II aircraft. The Citation X (36,100 pounds maximum takeoff weight) is in the transient fleet using the Airport now, but is not yet part of the Airport's based aircraft fleet. An aircraft operator based at the Airport is buying a Citation X for its increased range capability, to be able to fly nonstop to the East Coast. The future critical aircraft is the Cessna Citation X.

The ARC does not determine the runway length required. Among other things, runway length differs with aircraft performance and with stage length (trip distance), which determines the fuel load. Runway length is examined in the next chapter.

SUMMARY OF FORECASTS

Table 3Q summarizes all the aviation demand forecasts presented previously in this chapter. **Appendix H** includes the FAA TAF Worksheet, which is used to compare the two forecasts.

With this forecast data, the next step in the master planning process is to calculate the ability of existing facilities to meet the forecasted demand. Additionally, the next chapter will identify needed enhancements of airside and landside facilities to accommodate forecasted demand.

[33] Central Region FAA Newsletter, October 2001.

Table 3Q. Summary of Forecasts

	2010	2015	2020	2030
Based Aircraft				
Jet	23	27	33	47
Turboprop (Multi-Engine)	16	19	20	26
Multi-engine Piston	24	24	25	27
Single Engine	261	276	288	316
Helicopter	25	28	34	43
Other	5	5	5	5
Total	**354**	**379**	**405**	**464**
Aircraft Operations				
Itinerant Operations				
Air Taxi	10,000	10,815	11,697	13,682
GA	48,395	52,354	56,635	66,272
Military	250	250	250	250
Subtotal	*58,645*	*63,419*	*68,582*	*80,205*
Local Operations				
GA	32,264	34,902	37,756	44,181
Total	**90,909**	**98,321**	**106,338**	**124,386**
Operations Fleet Mix				
Jet	12%	13%	15%	18%
Turboprop	10%	11%	11%	12%
Piston	48%	44%	42%	37%
Helicopter	30%	32%	32%	33%
Peak Operations				
Peak Month	10,000	10,815	11,697	13,682
Design Day	328	355	384	449
Design Hour	36	39	42	49

Source: WHPacific, Inc.

Chapter Four: FACILITY REQUIREMENTS

Airport Master Plan Update

Aurora State Airport

In this chapter, existing airport facilities are evaluated to identify their functionality, condition, compliance with design standards, and capacity to accommodate demand projected in Chapter Three, *Aeronautical Activity Forecasts*.

The objective of this effort is to identify what facilities are needed and the adequacy of the existing airport facilities in meeting those needs. Where differences between existing and needed facilities are noted, this chapter identifies when those additional facilities may be needed. Once the facility requirements have been established, alternatives for providing these facilities will be created with input from the Oregon Department of Aviation (ODA), the Federal Aviation Administration (FAA), and the Planning Advisory Committee (PAC). The alternatives will be discussed in Chapter Five.

FAA Advisory Circular 150/5070-6B, *Airport Master Plans*, states the following about this stage of the planning process:

> Planners should determine what, if any, additional facilities will be required to accommodate forecast activity. This task begins with an assessment of the ability of existing facilities to meet current and future demand. If they cannot, planners must determine what additional facilities will be needed to accommodate the unmet demand.
>
> In some cases, the airport sponsor may decide that it is in the community's best interest for the airport not to continue to grow to accommodate forecast activity, or to accommodate forecast activity only up to a point. In these cases, the master plan should document this decision and indicate the probable consequences of the decision (e.g., demand will be capped, the demand will go unmet, or the demand will be diverted to another airport).

At this time, ODA has not decided to constrain Aurora State Airport's ability to meet the unconstrained forecasts presented in Chapter Three. Such a decision may occur later. Facility requirements were constrained in the 2000 airport master plan update because ODA made a policy decision to do so. In the 2000 Master Plan update, forecasting determined the Airport Reference Code (ARC) as B-II, which meant that airport design should accommodate light jets and turboprop aircraft, as well as less demanding aircraft types. Unconstrained forecasting projected jet traffic at the Airport would grow so

that the future ARC would be C-II, which meant that airport design should accommodate more medium-sized jets. ODA made a policy decision to constrain the forecasts by constraining the ARC to B-II. Since then, aircraft activity growth has exceeded both the unconstrained and constrained forecasts in the 2000 master plan update. Current activity has passed the FAA's threshold for the ARC to be C-II. This has been possible because the airfield is adequate for many operators of Aircraft Approach Category C airplanes, even though the Airport does not meet all design standards for ARC C-II. In this current master plan update, ODA will examine the impacts of meeting ARC C-II design standards and of accommodating the unconstrained forecasts from Chapter Three. It is anticipated that airport development alternatives analyzed in the next chapter will compare meeting the unconstrained demand forecasts fully, with accommodating no growth, and with accommodating constrained growth. This will allow ODA, with advice from the PAC, to make an informed decision about the possibility of constraining Airport growth.

BACKGROUND

Airport Planning and Development Criteria

Airport planning and development criteria are often defined by both federal and state agencies. The FAA provides specific guidance concerning dimensional standards and many state agencies provide generalized guidance based on facilities offered and aircraft activity levels. Both sets of planning criteria are discussed below, along with some industry criteria.

State and Federal Criteria

ODA has created general guidelines in the 2007 Oregon Aviation Plan (OAP) for airport planning and development based on the roles or categories of airports within the statewide system. The OAP identified five airport categories, each with its own set of performance criteria. The categories are based on factors such as the Airport's function, the type and level of activity at the Airport, and the facilities and services available. The Aurora State Airport (Airport) is classified as Category II – Urban General Aviation Airport. The function of this category is to support all general aviation aircraft and accommodate corporate aviation activity, including business jets, helicopters, and other general aviation activity. The OAP identified a few deficiencies at the Airport for meeting Category II minimum and desired criteria. To correct these deficiencies, the OAP recommends the Airport should:

- Increase Airport Reference Code from B-II to C-II
- Correct parallel taxiway / runway centerline separation (deficiency corrected in 2008)
- Install precision instrument approach
- Install medium intensity taxiway lighting (MITL) (deficiency corrected in 2008)
- Construct designated cargo apron

The FAA specifies design standards by ARC and instrument approach visibility minimums. The ARC is a coding system used to relate airport design criteria to the operational (Aircraft Approach Category – AAC) and the physical characteristics (Airplane Design Group – ADG) of the airplanes intended to operate at an airport. In the previous chapter, it was determined that the ARC at the Airport is C-II,

which is exemplified by the IAI Astra 1125. The airport design standards applicable for the IAI Astra 1125 are also applicable for many mid-sized business jets. An AAC of C represents aircraft with an approach speed between 121 and 141 knots. An ADG of II represents aircraft with tail heights of 20 to 30 feet and wingspans from 49 to 79 feet.

The Airport currently has nonprecision instrument approaches. For determining airport design criteria, instrument approach visibility minimums are divided into three categories:

- Visual and not lower than one-mile (currently at the Airport)
- Not lower than ¾-mile
- Lower than ¾-mile

The 2007 OAP and multiple Airport users – by means of survey – have indicated that a precision instrument approach procedure at the Airport would be desirable. New technology allows instrument approaches using the Global Positioning System (GPS) at a minimal cost, in terms of navigational aids and cockpit equipment. For many general aviation airports however, the cost of upgrading facilities (*e.g.*, larger safety clearances, installing lights) to the minimum requirements for the different approach visibility categories is a significant constraint to establishing or improving an instrument approach. This chapter presents the requirements of all the different instrument approach visibility minimums to aid in assessing the feasibility of an instrument approach, considering existing constraints.

Industry Criteria

The next paragraphs outline criteria important to the users of business jets and other business-oriented components of general aviation. These criteria are useful for planning the Airport's future but do not provide sufficient justification for the FAA to fund a project.

The National Business Aviation Association (NBAA) provides optimum and acceptable airport guidelines for corporate jets and turboprops, as shown in **Table 4A**. The guidelines describe specific aspects of airports important to business aviation operators, but are not intended to replace or override airport requirements under federal funding requirements. Table 4A indicates several features that the Airport lacks, including more runway length and instrumentation.

Table 4A. National Business Aviation Association Airport Guidelines

Airport Feature	Optimum		Acceptable	
Runways	Dimensions (ft.)[1]	Weight Capacity (lbs)[2]	Dimensions (ft.)	Weight Capacity (lbs)
Heavy Jet (above 50,000 pounds)	8,603 x 150	120,000	6,314 x 100	75,000
Medium Jet (up to 50,000 pounds)	6,314 x 100	75,000	5,742 x 100	50,000
Light Jet (up to 25,000 pounds)	5,170 x 100	50,000	4,597 x 75	20,000
Very Light Jet / Turboprop (up to 12,500 pounds)	4,597 x 75	25,000	3,453 x 60	15,000
	Taxiways for all runways 200 x 300 ft. ramp area min. Stabilized overruns on longest runway		Adequate ramp for maneuvering / parking	
Air Traffic Control (ATC) Tower	24 hours		None	
Lighting	Full approach light system High intensity runway lights Visual glideslope indictor on all runways		Runway End Identifier Lights (REIL) or Omnidirectional Approach Lighting System (ODALS) Medium intensity runway lights Visual glideslope on instrument runway Pilot controlled lights	
Instrument Procedures	Area Navigation (RNAV) Standard Instrument Departures (SIDs) Standard Terminal Arrival Route (STARs)		Area Navigation (RNAV) Standard Instrument Departures (SIDs) Standard Terminal Arrival Route (STARs)	
Weather Reporting	ASOS		AWOS	
Services	Full-service Fixed Base Operator (FBO)[3] Transient hangar space FAR Part 107[4] type security De-icing		Enclosed passenger waiting area Fuel/tiedowns Elementary security Telephone	
Maintenance	FAR Part 145 Repair Station		Minimal maintenance (tire/battery service, etc.)	
Amenities	Nearby hotel/motel Nearby restaurant		Distant hotel/motel Vending machines	

Source: NBAA Airports Handbook.

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[1] *Runway lengths from NBAA (standard 59 degrees & sea level) were adjusted for Airport conditions (elevation, temperature, runway gradient) described later in this chapter. Actual runway lengths needed for specific aircraft in specific circumstances will vary.*

[2] *Aircraft weights shown are for the group's Maximum Takeoff Weight (MTOW). "Acceptable" runway weight capacities are to accommodate 100% of the fleet within each category. "Optimum" runway weight capacities accommodate 100% of the category's fleet, as well as occasional use by aircraft in larger categories.*

[3] *Staffed 24/7, fuel, passenger and crew lounge, rental cars, shuttle/crew car, vending machine*

[4] *Now TSR (Transportation Security Regulation) Part 1542.*

AIRFIELD REQUIREMENTS

As discussed in Chapter Two, airfield facilities are those related to the arrival, departure, and ground movement of aircraft. Airfield facility requirements are addressed for the following areas:

- Airfield Capacity
- Airfield Design Standards
- Runway Orientation, Length, Width, and Pavement Strength
- Taxiways
- Airport Visual Aids
- Airport Lighting
- Radio Navigational Aids and Instrument Approach Procedures
- Other Airfield Recommendations

Airfield Capacity

The capacity of the runway system to accommodate existing and future aircraft operations was determined using the FAA Advisory Circular 150/5060-5, *Airport Capacity and Delay*. This publication describes throughput methods for calculating airport capacity derived from computer models the FAA uses to analyze airport capacity and reduce aircraft delay.

Capacity determined by using the advisory circular reflects the level of aircraft operations at which average delay per aircraft is not more than four minutes. The advisory circular describes two different methods of calculating runway capacity. Both methods assume there are no airspace limitations that would adversely affect flight operations.

One method of calculating capacity is to look at runway diagrams in Figure 2.1 of the circular. The FAA recommends using the capacity numbers in Figure 2.1 only for long-range planning and acknowledges that the assumptions underlying the capacity numbers are not applicable to every airport. Figure 2.1 shows that the capacity of a single runway with a mix index[5] below 20% – conditions at Aurora State Airport – is as follows:

Annual Service Volume (ASV)	230,000 operations
Visual Flight Rules (VFR) Hourly Capacity	98 operations
Instrument Flight Rules (IFR) Hourly Capacity	59 operations

[5] *Mix index is the percentage of total aircraft operations by Class C aircraft (those with maximum takeoff weights between 12,500 and 300,000 pounds) plus three times the percentage of Class D aircraft (those over 300,000 pounds maximum takeoff weight). Mix index at Aurora State Airport was estimated assuming 80% of jet aircraft operations are in Class C, 10% of the turboprop aircraft operations are in Class C, and no operations are in Class D. Consequently, the estimated mix index for the Airport in 2010 is 11%. The mix index rises slightly over time, to 12% in 2015, 13% in 2020, and 16% in 2030.*

A more detailed analytical method from *Airport Capacity and Delay* found that specific circumstances at Aurora State Airport account for a lower estimation of the Airport's current capacity. The calculation of ASV considers three different weather conditions—92% of the time when weather is above VFR minimums, 3% of the time when weather is below VFR minimums but above the Airport's instrument approach minimums, and 5% of the time no operations occur because weather is below the instrument approach minimums.[6] Runway utilization (percentage of the time Runway 17 or 35 is used) was not a factor, since the taxiway exit locations are the same from either runway end.

Over the forecast period, the capacity of the Airport will decline as the mix index (percentage of airplanes with maximum takeoff weights over 12,500 pounds) increases. Other circumstances, such as the instrument approach visibility minimums, are assumed to remain the same. **Table 4B** shows how capacity declines and demand increases in the future. It compares annual and hourly capacity to annual and hourly demand over the forecast period.

Table 4B. Capacity Analysis (Aircraft Operations)

2010	**Annual**	**VFR Hourly**	**IFR Hourly**
Capacity	207,473	111	62
Demand	90,909	36	2
Ratio Demand to Capacity	44%	32%	3%
2015	Annual	VFR Hourly	IFR Hourly
Capacity	199,717	107	61
Demand	98,321	39	3
Ratio Demand to Capacity	50%	36%	5%
2020	Annual	VFR Hourly	IFR Hourly
Capacity	197,778	106	61
Demand	106,338	42	3
Ratio Demand to Capacity	55%	40%	5%
2030	Annual	VFR Hourly	IFR Hourly
Capacity	186,144	99	60
Demand	124,386	49	4
Ratio Demand to Capacity	67%	49%	7%

[6] *Instrument weather conditions were determined from Aurora State Airport weather data for 2000 through 2009 obtained from the National Oceanic and Atmospheric Administration (NOAA). The ten years of data included 77,646 weather observations made by the Airport's ASOS. Some data interpolation is required to estimate that IFR weather occurs 8% of the time. The lowest visibility minimums of instrument approaches to the Airport are 1 mile—a condition that is estimated to occur 5% of the time.*

The table shows that the demand forecast for the Airport stays below the capacity through 2030. FAA guidance[7] recommends planning for increased capacity (*e.g.*, additional taxiway exits, a new runway, or supplemental airport) when an airport reaches 60% to 75% of its capacity. Table 4B indicates that planning for additional capacity should not be required until near the end of the planning period.

Number and Orientation of Runways

The number of runways needed for an airport depends upon the level of aviation demand and wind coverage. The previous airfield capacity analysis concluded that an additional runway is not needed for the 2030 unconstrained forecast of aircraft operations. An analysis of wind coverage found that a crosswind runway is not needed at the Airport, as explained below.

For the operational safety and efficiency of an airport, it is desirable for the primary runway to be oriented as close as possible to the direction of the prevailing wind. This reduces the impact of crosswind components during landing or takeoff. Wind coverage is the percent of the time crosswind components are below an acceptable velocity. The desirable minimum wind coverage for an airport is 95%, based on maximum crosswind speeds that are defined for different sizes of aircraft (lower for smaller aircraft). Ten years of wind data (2000 through 2009) at Aurora State Airport were examined. The analysis found that Runway 17/35 exceeds the 95% threshold for a 10.5-knot (12 mph) crosswind, which is the maximum for the smallest airplanes.

Airfield Design Standards

FAA Advisory Circular 150/5300-13, *Airport Design,* sets forth the FAA's recommended standards for airport design. A few of the more critical design standards are those for runways and the areas surrounding runways, including:

- Runway Safety Area (RSA)
- Object Free Area (OFA)
- Obstacle Free Zone (OFZ)
- Runway Protection Zone (RPZ)

The RSA is a defined surface surrounding the runway that is prepared or suitable for reducing the risk of damage to airplanes in case of an airplane undershoot, overshoot, or an excursion from the runway.

The OFA is an area on the ground centered on the runway or taxiway centerline that is provided to enhance the safety of aircraft operations. No above ground objects are allowed except for those that need to be located in the OFA for air navigation or aircraft ground maneuvering purposes.

The OFZ is a volume of airspace that is required to be clear of objects, except for frangible items required for the navigation of aircraft. It is centered along the runway and extended runway centerline.

The RPZ is an area off each runway end whose purpose is to enhance the protection of people and property on the ground. The RPZ is trapezoidal in shape and centered about the extended runway

[7] *FAA Order 5090.3C, Field Formulation of the National Plan of Integrated Airport Systems (NPIAS), Table 3-2.*

centerline. The dimensions of an RPZ are a function of the runway ARC and approach visibility minimums. Among other things, the FAA recommends that RPZs be clear of all residences and places of public assembly (churches, schools, hospitals, etc.) and that airport owners acquire the land within the RPZs so they can control the use of land.

In addition to these design standards, the FAA provides recommended dimensions for runway width, taxiway width, taxiway safety areas, and others. **Table 4C** compares the Airport's existing B-II dimensions to the design standards for ARC C-II. The ARC C-II standards in Table 4C are based on three approach categories. One column reflects the existing approach minimums – visual and not lower than 1 statute mile. The other approach categories are not lower than ¾ statute mile and lower than ¾ statute mile.

Table 4C. Airfield Design Standards

		Existing Dimensions (ARC B-II)	ARC C-II Visual and not lower than 1 statute mile	ARC C-II Not lower than ¾ statute mile	ARC C-II Lower than ¾ statute mile
Runway Width		100'	100'	100'	100'
Runway Centerline to Parallel Taxiway Centerline Separation		300'	300'	300'	400'
RSA	Width	150'	500'	500'	500'
	Length beyond runway end	300'	1,000'	1,000'	1,000'
OFA	Width	500'	800'	800'	800'
	Length beyond runway end	300'	1,000'	1,000'	1,000'
OFZ	Width	250'	400'	400'	400'
	Length beyond runway end	200'	200'	200'	200'
Precision OFZ [8]	Width	N/A	N/A	N/A	800'
	Length	N/A	N/A	N/A	200'
RPZ	Inner Width	500'[9]	500'	1,000'	1,000'
	Outer Width	700'	1,010'	1,510'	1,750'
	Length	1,000'	1,700'	1,700'	2,500'
Runway Blast Pads	Width	0'	120'	120'	120'
	Length	0'	150'	150'	150'
Runway Shoulder Width		10'	10'	10'	10'
Taxiway Width		35'	35'	35'	35'
Taxiway Safety Area Width		79'	79'	79'	79'
Taxiway Object Free Area Width		131'	131'	131'	131'

Source: FAA Advisory Circular 150/5300-13

[8] *A Precision OFZ (POFZ) is a volume of airspace beginning at the runway threshold and at the threshold elevation. It is in effect only when the following three conditions are met: Vertically guided approach, reported ceiling below 250' and/or visibility less than ¾ mile, and an aircraft on final approach within two miles of runway threshold.*

[9] *Existing RPZ dimensions meet the ARC B-II criteria for approaches with minimums not lower than 1 mile, which represents the existing instrument approach procedures into the Airport.*

The Airport meets or exceeds all B-II design standards for visual/not lower than 1 statute mile. Except for RPZ size, the Airport also meets or exceeds B-II design standards for not lower than ¾ statute mile approach minimums. For ARC B-II with approach minimums lower than ¾ statute mile, the Airport is deficient for RSA, OFA, and RPZ standards. When upgrading an airport's ARC from B-II to C-II, there are prominent increases in the dimensions of RSA, OFA, OFZ width, and RPZ, as shown in Table 4C.

Runway Length

The runway length required for an aircraft is different for landing and for takeoff, and it depends on several factors such as airport elevation, temperature, runway gradient, airplane operating weights, runway surface conditions (*i.e.*, wet or dry), and others. A single airplane using Aurora State Airport will require different runway lengths at different times, depending on temperature, runway surface condition, the airplane's weight, which varies with the stage length (length of trip or distance between refueling stops), and other factors.

FAA Advisory Circular 150/5325-4B, *Runway Length Requirements for Airport Design*, the FAA's Airport Design Computer Program, and aircraft manufacturers' specifications were consulted for guidance on recommended runway length at the Airport. In addition, aircraft operators were surveyed to quantify operations that are constrained by the current runway length at Aurora State Airport.

Both the Advisory Circular and the FAA's computer program classify aircraft based on weight. For "small" airplanes (those with maximum takeoff weights of 12,500 pounds or less), the classifications are further divided into two additional categories - small airplanes with fewer than 10 passenger seats and small airplanes with 10 or more passenger seats. Additionally, the program displays recommended runway lengths for airplanes between 12,500 and 60,000 pounds maximum takeoff weight. The computer program, using site-specific data, reflects runway length recommendations by grouping general aviation aircraft into several categories, reflecting the percentage of the fleet within each category. **Table 4D** summarizes the FAA's generalized runway length recommendations for the Airport.

The current runway length of 5,004 feet accommodates 100% of the small aircraft fleet with fewer than 10 passenger seats. However, the recommended lengths for larger aircraft exceed the current runway length.

Table 4D indicates that a longer runway may be needed at Aurora State Airport for airplanes over 12 ,500 pounds maximum takeoff weight. Table 4A also indicated a longer runway might be needed at the Airport for light and medium jets, according to NBAA recommendations. Planning for a longer runway may be justified based on these two tables, but to obtain FAA funding for a runway extension requires additional justification that is described in the next paragraphs.

Table 4D. Runway Length Requirements

Airport and Runway Data	
Airport elevation	200 feet
Mean daily maximum temperature of the hottest month	84° F
Maximum difference in runway centerline elevation	2 feet
Wet and slippery runways	
Runway Lengths Recommended for Airport Design	
Small airplanes with less than 10 passenger seats	
To accommodate 75 percent of these small airplanes	2,510 feet
To accommodate 95 percent of these small airplanes	3,060 feet
To accommodate 100 percent of these small airplanes	3,630 feet
Small airplanes with 10 or more passenger seats	4,190 feet
Large airplanes of 60,000 pounds or less	
75% of these large airplanes at 60% useful load	5,330 feet
75% of these large airplanes at 90% useful load	7,000 feet
100% of these large airplanes at 60% useful load	5,500 feet
100% of these large airplanes at 90% useful load	7,850 feet

Source: FAA's Airport Design Computer Program, Version 4.2D, AC 150/5325-4B, Runway Length Requirements for Airport Design.

Runway Length Justification Process

FAA guidance states that to justify funding a runway extension, at least 500 annual itinerant aircraft operations must exhibit a need for an extension now or within the next five years. Determining the particular aircraft model(s) critical for runway length is much easier at a commercial service airport than at a general aviation airport because at a commercial service airport individual airlines mostly use the same type of airplanes and they publish flight schedules that facilitate quantifying numbers of operations and stage lengths. Gathering such data for a general aviation airport is more difficult. In addition, the FAA requires rigorous justification for extending runways at general aviation airports, including documentation from the operators of airplanes needing a longer runway with the individual N numbers of their airplanes and number of constrained operations. A constrained operation is one that must reduce payload for takeoff, or stop en route for fuel, for example.

To quantify constrained operations at Aurora State Airport, questionnaires were distributed to the operators of larger aircraft that use the Airport frequently. Transient aircraft operators were identified from IFR flight plan records. The questionnaires received are in **Appendix I** and the operators who identified constrained operations are listed in **Table 4E**.

Table 4E contains a list of business jets that have operated at the Airport in recent years, as documented by IFR flight plans. The table also indicates which airplane models are based at the Airport and gives the number of constrained operations reported by based and transient users of the Airport. The table lists airplane models in the order of runway length required at maximum takeoff weight, from shortest to longest. Many models listed in the table need a longer runway at maximum takeoff weight than Aurora State Airport's 5,004 feet; these airplanes can use the Airport because they are operating at less than their maximum takeoff weights and/or the temperature is lower than 84 degrees. Usually, airplanes are

constrained for takeoff due to high summer temperatures; however, for some airplanes operating under air taxi or fractional jet regulations, the constrained operation is landing on a wet or slippery runway. In addition, the lengths in Table 4E are based solely on aircraft performance requirements. Some operators may have additional requirements based on company operations specifications or insurance.

Table 4E. Business Jet Runway Length Requirements at Aurora State Airport

TYPE	ARC	Max. Takeoff Weight (lbs)	Takeoff Distance (MTOW)	Based at UAO	Constrained Operations Reported
CESSNA 551 CITATION II/SP	B-II	12,500	3,042	No	
CESSNA 501 CITATION I/SP	B-I	11,850	3,249	Yes	
CESSNA 500 CITATION	B-I	11,850	3,364	No	
CESSNA 550 CITATION II	B-II	13,300	3,433	No	
CESSNA 525 CITATION (CJ-1)	B-I	10,400	3,536	Yes	
CESSNA 525B CITATIONJET III (CJ-3)	B-II	13,870	3,651	Yes	JHRD Investment
CESSNA 560 CITATION V ULTRA	B-II	16,300	3,651	Yes	
LEARJET 31	C-I	16,500	3,915	No	
CESSNA 525A CITATIONJET II (CJ-2)	B-II	12,500	3,926	Yes	
CESSNA 560 CITATION ENCORE	B-II	16,830	4,087	Yes	
CESSNA 560 CITATION EXCEL	B-II	20,000	4,121	Yes	Management West
CESSNA 550 CITATION BRAVO	B-II	14,800	4,133	No	
RAYTHEON 390 PREMIER	B-1	12,500	4,353	No	
BEECHJET 400A/T/ T-1A JAYHAWK	C-I	16,100	4,786	No	
LEARJET 45	C-I	20,200	4,845	Yes	Premier Air
MITSUBISHI MU-300	B-I	14,630	4,936	No	
DASSAULT FALCON 900	B-II	45,500	5,373	No	
DASSAULT FALCON 50	B-II	37,480	5,413	No	
CESSNA 650 CITATION VII	C-II	23,000	5,568	Yes	
DASSAULT FALCON 7X	B-II	69,000	5,586	Yes	
DASSAULT FALCON 900 EX	C-II	48,300	5,723	Yes	CSIM
LEARJET 35/36	C-I	18,300	5,740	No	
CESSNA 750 CITATION X	C-II	36,100	5,901	No*	RJ2/DB Aviation
CESSNA 650 CITATION III/VI	C-II	21,000	5,912	Yes*	RJ2/DB Aviation
DASSAULT FALCON 2000	B-II	35,800	6,016	No	
RAYTHEON/HAWKER 125-1000 HORIZON	C-II	36,000	6,027	Yes	

**RJ2/DB Aviation plans to replace the Cessna 650 Citation III/VI with the Cessna 750 Citation X in the near future.*

Table 4E. Business Jet Runway Length Requirements at Aurora State Airport (cont.)

TYPE	ARC	Max. Takeoff Weight (lbs)	Takeoff Distance (MTOW)	Based at UAO	Constrained Operations Reported
IAI - ASTRA 1125	C-II	23,500	6,084	Yes	Novellus, American Medical Concepts, Transcendent Investments
LEARJET 55	C-I	21,500	6,096	No	
LEARJET 60	D-I	23,500	6,153	No	
RAYTHEON/HAWKER 125-800	B-I	28,000	6,176	Yes	WAC Charter
EMBRAER 135	C-II	41,887	6,177	No	Aero Air
GULFSTREAM IV	D-II	71,780	6,257	No	
IAI - GALAXY 1126/Gulfstream G200	C-II	34,850	6,314	No	Anonymous
BOMBARDIER CL-601	C-II	41,250	6,544	No	Anonymous, Aero Air
BOMBARDIER CL-604	C-II	47,600	6,544	No	Anonymous
GULFSTREAM V	D-III	89,000	6,877	No	Vulcan Flight
BOMBARDIER BD-700 GLOBAL EXPRESS	C-III	93,500	7,232	No	Vulcan Flight, Y2K Aviation

Source: WHPacific, 2010, using business jet characteristics published by the Central Region FAA in 2001, manufacturers' specifications, based aircraft from Oregon Department of Aviation aircraft registration records, constrained operators from runway length survey conducted in 2009 and 2010. List includes only business jet models that have documented operations at the Airport according to IFR flight plan records or an operator who wants to use the Airport. Takeoff distances are based only on aircraft performance; federal aviation regulations, company policies, or insurance requirements may require more length. Takeoff distances for standard conditions were adjusted (+14.8%) to account for design conditions at Aurora state Airport.

The runway lengths listed in Table 4E use the manufacturers' takeoff distance for standard conditions (sea level and 59 degrees F). These lengths were increased 14.8% to account for the higher elevation (200 feet MSL), higher design temperature (84 degrees), and runway gradient (2 feet of difference between runway high and low points). The formula for determining the amount of increase is:

Altitude Correction
(7% per 1,000' above sea level)

L = Takeoff length @ sea level
L1 = Length corrected for altitude
L1 = (.07 * E / 1000) * L + L

Temperature Correction
(0.5% per degree above standard temperature in hottest month)

T1 = Adjusted Standard Temperature
T = Mean Max High Temperature
L2 = Length corrected for altitude & temperature

(Std Temp adjusted to Sea Level)

T1 = 59 - (3.566 * E / 1000)
L2 = (.005*(T - T1)) * L1 + L1

Effective Gradient Correction (takeoff only)
(10' for each 1' difference between High / Low Point)

G = Difference between high / low point in feet
L3 = RW length corrected for altitude, temperature & gradient
L3 = G * 10 + L2

For three aircraft models, operators report constrained operations although the takeoff distance listed in Table 4E is less than the length of Runway 17/35. Two mentioned constraints on hot summer days, which are likely days when the temperature exceeds 84 degrees.

The runway length survey (Appendix I) identified the number of aircraft operations constrained at the Airport annually total 473, using only existing aircraft with N numbers and operators' names identified and using the average number of constrained operations if the operator identified a range of operations. Operators who wished to remain anonymous identified 12 more annual constrained operations. One operator based at the Airport, RJ2/DB Aviation, plans to replace its 650 Citation III/VI with a 750 Citation X, which would be constrained by runway length more often (an estimated 40 times per year compared to 30 for the existing aircraft).

To justify funding a runway extension, the FAA will not accept information for which the operator or the aircraft is not specifically identified. The identified number of constrained operations, 473, does not meet the 500 operations threshold at present time. Applying to 473 an annual growth rate of 3.6%[10], the number of annual constrained operations would reach 500 in 2012.

The 500 annual constrained operations threshold is projected to occur within five years. Even if jet traffic does not grow as fast as projected, it is likely the number of constrained operations will exceed 500 within the 20-year planning period. Consequently, ODA may want to consider planning for a runway extension now, in order to protect the airspace needed, among other things. To justify FAA funding for a planned extension, operators may need to be surveyed again in the future to identify operations that may be constrained.

Table 4E indicates the longest runway required for ARC C-II aircraft (Bombardier CL-601 and CL-604) that use the Airport is 6,544 feet, at maximum takeoff weight. This is 1,540 feet longer than the existing Runway 17/35. The longest runway required for an Aircraft Approach Category B aircraft (Raytheon/Hawker 125-800) is 6,176 feet, at maximum takeoff weight. This is 1,172 feet longer than the existing Runway 17/35. Most takeoffs are at weights under the certified maximum, so that the runway length needed is less. On the other hand, temperatures in the summer can exceed the 84 degrees used to determine runway length in Table 4E.

In the formulation of development alternatives, one or more alternatives might consider a runway extension, in order to evaluate relevant consequences.

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[10] *Table 3M in Chapter Three shows the jet operations forecast, from 10,909 annual operations in 2010 to 22,389 annual operations in 2030, which equates to a 3.6% average annual growth rate.*

Runway Width

The current runway width of 100 feet meets the FAA's recommended standard for C-II aircraft and the current instrument approach, as well as for a precision approach with lower than ¾ mile visibility minimums.

Runway Pavement Strength

The most important feature of airfield pavement is its ability to withstand repeated use by the most weight-demanding aircraft that operates at an airport. The pavement strength rating of Runway 17/35 is 30,000 pounds for single wheel gear and 45,000 pounds for dual-wheel gear. The maximum takeoff weight of ARC C-II aircraft in Table 4E is more than 45,000 pounds (dual-wheel gear). The Airport's parallel taxiway is now designed for 60,000 pounds (dual-wheel gear), and this is the next "break point" in pavement design from the runway's current design strength. The current strength rating is adequate for the current runway length and using aircraft, because the larger aircraft are operating in a constrained situation – whether it is runway length or high ambient temperature – and are not likely at the maximum takeoff weight for that aircraft. Any future runway lengthening would affect the pavement strength required, as it would remove some of the constraints.

Taxiways

The runway currently has a full-length parallel taxiway. A full-length parallel taxiway provides a safe, efficient traffic flow and eliminates the need for aircraft to back-taxi before takeoff or after landing. The FAA recommends a parallel taxiway for nonprecision instrument approaches with visibility minimums of one mile or more and requires a parallel taxiway for instrument approaches with visibility minimums lower than one mile. The 2007 OAP recommends placement of high-speed (acute-angled) exit taxiways as part of the desired criteria. To have room for acute-angled exit taxiways, the runway centerline to parallel taxiway centerline spacing must be at least 400 feet for ADG II.

Runway centerline to parallel taxiway centerline separation distance is another important criterion to examine. The recommended distance is based on satisfying the requirement that no part of an aircraft on a taxiway or taxilane centerline is within the runway safety area or penetrates the runway obstacle free zone (OFZ). The current distance between the runway centerline and the parallel taxiway centerline is 300 feet, which meets the standard for C-II instrument runways with visibility minimums not lower than ¾ mile. However, it is deficient for the 400 feet for C-II runways with lower than ¾ mile visibility minimums.

Similar to runway width, taxiway width is also determined by the ADG of the most demanding aircraft to use the taxiway. The existing taxiways at the Airport are 35 feet wide, which meet the design standard.

The connectors and parallel taxiway system on Airport property meets FAA recommended standards and should be maintained through preventative pavement maintenance.

Taxilanes have object free area requirements, which are slightly less than for taxiways, because aircraft are moving more slowly on taxilanes than on taxiways. For ADG II, the taxilane OFA is 115 feet. Taxilanes in areas serving only ADG I aircraft should meet the 79-foot wide OFA requirement. Most

taxilanes at the Airport are on private property. All taxilane development on private property should be designed to the same design standards as taxilanes on ODA property. However, if a situation is constrained from meeting taxiway/taxilane safety and object free areas, the FAA provides the following guidance for showing that a modification of these standards will provide an acceptable level of safety:

- Taxiway safety area width equals the airplane wingspan
- Taxiway OFA width equals 1.4 times airplane wingspan plus 20 feet
- Taxilane OFA width equals 1.2 times airplane wingspan plus 20 feet

Airport Visual Aids

Airports commonly include a variety of visual aids such as pavement markings and signage to assist pilots using the airport.

Pavement Markings.

Runway markings are designed according to the type of instrument approach available on the runway. FAA Advisory Circular 150/5340-1J, *Standards for Airport Markings*, provides the guidance for airport markings. Precision markings are currently in place on Runway 17/35, which is adequate for all types of instrumentation currently at the Airport and for any upgrades to a precision approach.

There are runway holding position markings on all taxiways adjoining the runway. The purpose of these markings is to ensure that aircraft waiting for arriving or departing aircraft to clear the runway are not in the RSA. In addition to runway holding position markings, all taxiways are clearly marked with centerlines. Existing taxiway markings at the Airport are adequate.

Airfield Signage.

The Airport currently has lighted hold signs on taxiways adjoining the runway. The existing signage is sufficient for the existing airfield layout. Any future additional taxiways and aprons will require additional signs. While not required to meet FAA design standards, it is recommended through-the-fence operators also install signage on future taxiways and taxilanes.

Airport Lighting

Beacon.

The Airport's rotating beacon is adequate for the planning period.

Visual Approach Aids.

As discussed in Chapter Two, the Airport has three forms of visual approach aids. A four-box Visual Approach Slope Indicator (VASI) is located on each runway end. Runway 17 also has an Omnidirectional Approach Lighting System (ODAL) and Runway End Identification Lights (REILs). A precision approach path indicator (PAPI) is similar to VASI, but the lights are in a single row, rather than two rows. A PAPI is a more precise form of glide slope indicator, and it is recommended that ODA upgrade to a PAPI system.

Runway and Taxiway Lighting.

Airport lighting systems provide critical guidance to pilots at night and during low visibility conditions. Runway 17/35 and the parallel taxiway are equipped with medium intensity lighting. It is recommended this system be maintained throughout the planning period.

If a precision instrument approach were implemented, an instrument approach lighting system more extensive than the ODAL system would be required.

Effective ground movement of aircraft at night is enhanced by the availability of taxiway lighting. The adjacent taxiways or taxilanes at the Airport have edge reflectors, which is adequate for the planning period.

The Airport is equipped with pilot-controlled lighting (PCL). PCL allows pilots to turn runway lighting on and control its intensity using the radio transmitter in their aircraft. The PCL system is energy-efficient and should be maintained.

Radio Navigational Aids & Instrument Approach Procedures

Radio Navigational Aids. There is a localizer navigational aid at the Airport. Additionally, the Battle Ground and Newberg VORs (Very High Frequency Omni-Directional Range) can be used to guide a pilot to the Airport.

Instrument and Noise Abatement Procedures. The Airport has several nonprecision instrument approaches, as detailed in Chapter Two. The lowest visibility minimum for the approaches is 1 statute mile for aircraft in Aircraft Approach Categories A and B. For Aircraft Approach Category C, the lowest approach visibility minimums are 1-1/4 statute mile. For most instrument approaches, 1-1/2 mile visibility minimums apply for Category C, and minimums for Category D aircraft are generally higher. When weather is below the minimums prescribed by the Airport's instrument approaches, aircraft cannot land, and the Airport is closed in effect to air transportation.

The previous airfield capacity analysis estimated that weather is below 1-mile visibility 5% of the time. The Airport would be below Approach Category C and D minimums a higher percentage of the time. Low visibility weather is not spread evenly throughout the year. In the months of May through August, visibility is below 1-mile less than 1% of the time on average, but in the months of November through January the weather is below approach minimums more than 10% of the time.[11]

Having an approach that is usable in lower visibility minimums would make the Airport a more reliable mode of air transportation, which is particularly important for emergency and business use. Meeting the typical minimums for an Instrument Landing System (200-foot ceiling and/or ½-mile visibility) would halve the amount of Airport "closure," since weather is below these minimums 2.3% of the time. However, since lower visibility minimums would increase the size of certain FAA design standards shown in Table 4C, improving the instrument approach capability of the Airport to provide visibility minimums lower than 1 mile should be considered in the development alternatives for the Airport. Implementing any new instrument approach procedures will need evaluation by the FAA Flight Procedures Office.

If a better instrument approach is obtained, it should be for Runway 35, since that runway accommodates more traffic and is the preferential runway for noise abatement purposes. The

[11] *Weather data obtained from NOAA for 2000-2009.*

preferable and safest direction for takeoff and landing is into the wind, although wind is not a consideration in runway choice when winds are calm. At Aurora State Airport, the wind is calm (below 5 knots) about 60% of the time.[12] To reduce noise impact, Runway 35 has been designated the preferential/calm-wind runway. When the wind is strongest it is usually from the south, which for safety requires pilots to use Runway 17. The noise analysis prepared in 2002[13] estimated that 80% of aircraft operations could be on Runway 35 if it were designated the calm-wind runway and certain changes were made to instrument approaches and procedures. Runway 35 has since been designated the calm wind runway, but the other changes have not yet been implemented. The additional noise abatement procedures recommended in 2002 were as follows:

- Establish an additional departure procedure for Runway 35 that would allow a 90-degree right turn at 900 feet MSL. (The FAA is working on this now, at ODA's request.) These procedures would be mandatory when operating under instrument flight rules. Air traffic controllers could direct visual flight rules traffic to use the procedure.
- Change the altitude limit on left turns when departing Runway 35, which would allow turns at 900 feet MSL rather than the existing 1200 feet MSL.
- Investigate the potential to allow a back-course approach to Runway 35, which would utilize the Runway 17 localizer for approaches to Runway 35. According to the DECIBEL Committee and ODA, an upgrade to the existing Runway 17 DME is required before this is possible.

The back-course approach to Runway 35 relates to one of the planning issues identified in Chapter One. Flight students use the Runway 17 localizer approach to aid in training during calm-wind conditions, which creates conflicting traffic patterns with the preferential use of Runway 35. The FAA is transitioning to GPS-based approaches from traditional Instrument Landing Systems that use ground-based navigational aids such as localizers. Consequently, it may be difficult to upgrade a traditional radio-type navigational aid or obtain a new instrument approach using one.

Other Airfield Recommendations

Traffic Pattern.

The current traffic pattern requires left hand traffic for Runways 17 and 35 for noise abatement. ODA has worked extensively to create noise abatement procedures to avoid flights over noise sensitive areas. **Exhibit 4A** depicts the fixed wing and helicopter traffic patterns at Aurora State. ODA will continue to work with airport users and educate them on the noise abatement procedures.

Wind Indicators/Segmented Circle.

The existing windcone and segmented circle are located on the west side of the runway at about midfield. These facilities are adequate and should be maintained throughout the planning period.

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[12] *NOAA weather data for 2000-2009 indicates the wind is between 0 and 3 knots 45.7% of the time and between 4 and 6 knots 28.4% of the time.*

[13] *Harris Miller Miller & Hanson Inc.: Final Memorandum to Daren Griffin, State Airports Manager Oregon Department of Aviation about Aurora State Airport Noise Mitigation Program, May 31, 2002.*

Weather Reporting. Real-time weather reporting at the Airport is supplied via Automated Surface Observation System (ASOS). No changes are recommended.

LANDSIDE REQUIREMENTS

Landside facilities are those facilities necessary for handling aircraft on the ground and those facilities that provide an interface between the air and ground transportation modes. Landside requirements are addressed for the following facilities:

- Hangars
- Aprons and Aircraft Parking
- Aviation Businesses and Services
- Air Traffic Control Tower

As the following analysis shows, the amount of land currently owned by ODA and the adjacent undeveloped land that is appropriately zoned is insufficient to accommodate the landside development needed to meet the 20-year forecast. In the next stage of the planning process, in which development alternatives are evaluated, it will be decided if the land area for future based aircraft storage and other aviation purposes should be constrained or not. **Table 4F** summarizes the projections of additional land development needed to meet the forecast demand. The rest of this section describes how these land requirements were determined.

The projection of land needed to accommodate the forecast growth in aviation demand over the next 20 years is 39.6 acres. Currently, about 9 acres of ODA land are undeveloped, and about 26 acres of private property appropriately zoned for Airport development[14] are undeveloped.

Table 4F. Projected Landside Development Requirement (acres)

Facilities	2011-2015	2016-2020	2021-2030	Total
Hangars	4.9	5.4	12.7	23.0
Aprons	1.5	1.5	3.4	6.5
Cargo Apron	0.9	0.0	0.0	0.9
Aviation Businesses & Services	1.5	1.6	3.9	7.0
Air Traffic Control Tower	2.0	0.0	0.0	2.0
Fire Station	0.2	0.0	0.0	0.2
Total	11.0	8.5	20.0	39.6

Source: WHPacific, Inc., 2011.

[14] *This includes about half of the 27.5-acre site that was recently rezoned for Helicopter Transport Services. Helicopter Transport Services is now building on about half of the site. Zoning on that site only allows for helicopter-related uses at this time.*

AURORA AIRPORT NOISE ABATEMENT PROCEDURES:
PREFERRED TRAFFIC PATTERN

CALM WIND RWY 35

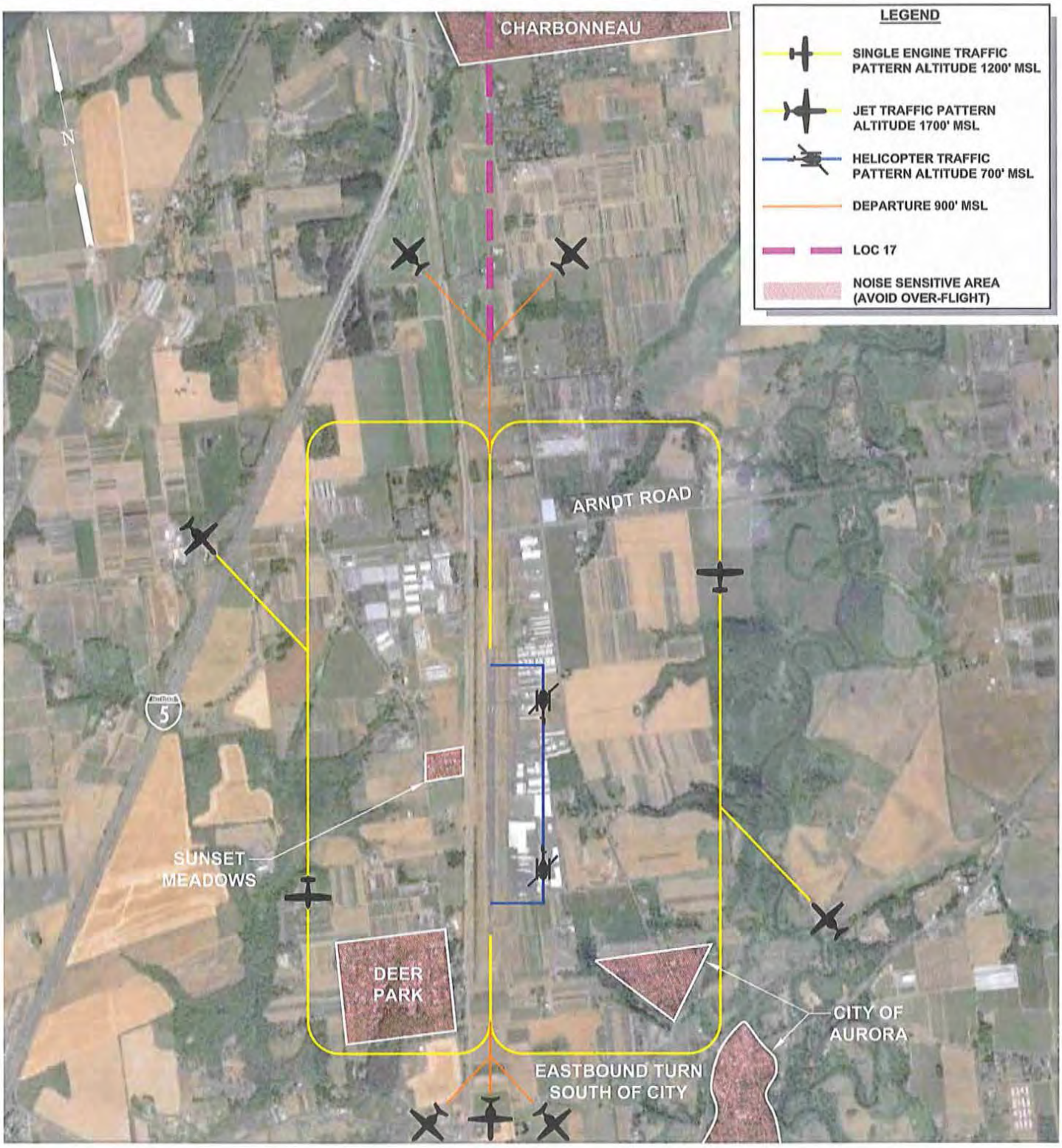


Exhibit 4A ~ Noise Abatement Procedures

Aurora State Airport
Aurora, OR

Nov 18, 2010

WHPacific

032033–PLAN–NA01.DWG

Hangars

Based aircraft can be stored in hangars or at apron tiedowns. Aircraft value, climate, security concerns, the relative cost and availability of hangars vs. tiedowns, and individual preference can influence an aircraft owner's choice between a hangar and a tiedown. Nationwide and at Aurora State Airport, the trend has been to favor hangars over tiedowns. Since the 2000 Master Plan Update, the number of tiedowns at the Airport has decreased from 180 to 83, due partly to hangar construction.

For this analysis, it is assumed that hangars will be built for all the additional based aircraft forecast, and the need for additional tiedowns and apron parking will be limited to transient aircraft. With few exceptions, hangars are not eligible for the FAA's Airport Improvement Program grant funding. Consequently new hangar construction on ODA-owned land would likely be privately funded on land leased from the ODA. Where "through-the-fence" access to the Airport is possible, private land ownership is possible.

Hangar facilities at the Airport consist of a combination of T-hangars and conventional hangars. T-hangars typically store one aircraft in one unit, which is attached to other units. Conventional hangars are stand-alone buildings that can store one or more aircraft.

The area required to store an aircraft varies not only with the size of the aircraft, but also with the hangar configuration and layout. T-hangars are especially efficient because each unit has a "T" shaped floor plan that molds to the shape of an airplane, and individual T-hangar units "nest" back-to-back to form a long rectangular building with aircraft access along two sides. Conventional hangars have rectangular floor plans and usually can store multiple aircraft of different sizes efficiently. Conventional hangars provide more storage flexibility than T-hangars, but have the disadvantage that it is sometimes necessary to move airplanes to get one out from behind another one. Within the Southend Airpark are some conventional hangars with aircraft doors on two (opposite) sides. This is highly convenient but uses more land.

FAA Advisory Circular 150/5300-13, *Airport Design*, Appendix 5, shows nested T-hangar layouts that accommodate between 10 and 14 aircraft per acre, depending upon whether the taxilanes between hangars allow two-way or one-way traffic. These layouts are based on hangars with clear door widths of 40 feet and depths of 30 feet, and would accommodate many Airplane Design Group I aircraft. Willamette Aviation's T-hangars numbered 80 through 83 on Exhibit 2B demonstrate this density of aircraft storage. Fourteen aircraft per acre would be the maximum density achievable at the Airport for the smallest airplanes.

Table 4G outlines the criteria used to project hangar requirements. The table lists a representative aircraft for each of the based aircraft types forecast in Chapter Three. The "footprint" of each aircraft example is the square footage resulting from multiplying the airplane's width (wingspan or rotor diameter) times its length. The table lists a low, high, and average hangar area for each aircraft type. The low hangar area for the single engine, multi-engine, and turboprop represents T-hangar area where the building shape conforms to the airplane shape. The table also lists low, high, and average ratios of

land area to hangar area. These account for the taxilanes necessary for aircraft circulation, as well as land around buildings for fire separation and drainage.

Table 4G. Criteria for Hangar Requirements

Criteria	Single Engine	Multi-Engine Piston	Turbo-prop	Jet	Heli-copter
Example Aircraft	Cessna 172	Beech Baron	King Air	Cessna Citation III	Bell 206B
Footprint (width x length, sq. ft.)	980	1,126	2,387	2,969	1,322
Low Hangar Area per Aircraft (sq. ft.)	1,000	1,200	2,500	3,500	1,500
High Hangar Area per Aircraft (sq. ft.)	2,000	3,000	4,000	5,000	3,000
Average Hangar Area per Aircraft (sq. ft.)	1,500	2,100	3,250	4,250	2,250
Average Vehicle Parking Space per Aircraft	0.2	0.2	0.5	1.5	0.2
Low Land Area per Aircraft including taxilanes = 3.1 x hangar area					
High Land Area per Aircraft including taxilanes = 4.3 x hangar area					
Average Land Area per Aircraft including taxilanes = 3.7 x hangar area					
Average Land Area per Vehicle Parking Space = 450 sq. ft.					

Source: WHPacific, Inc. 2010.

Vehicle access is another component of hangar development addressed in Table 4G. Aircraft owners typically park their vehicles in their individual hangars when they are flying, so vehicle parking in T-hangar and small conventional hangar areas are primarily needed when passengers drive separately from the pilot. For single-engine, multi-engine piston, and helicopter hangar areas, the ratio is one vehicle parking space to five aircraft. The higher vehicle parking ratios for turboprop and jet aircraft reflect higher aircraft utilization and higher passenger capacity. The land area per vehicle parking space, 450 square feet, provides for access drives and individual parking spaces.

Using the average criteria from Table 4G, the hangar building and land requirements for the next 20 years are as shown in **Table 4H**. Table 4H shows that the hangar development demand projected through 2030 needs a total of 23.0 acres.

Table 4H. Hangar Requirements

	Single Engine	Multi-Engine Piston	Turbo-prop	Jet	Helicopter	Total
Additional Aircraft						
2011-2015	15	0	3	4	3	25
2016-2020	12	1	1	6	6	26
2021-2030	28	2	6	14	9	59
Total	55	3	10	24	18	110
Additional Hangar Area (sq. ft.)						
2011-2015	22,500	0	9,750	17,000	6,750	56,000
2016-2020	18,000	2,100	3,250	25,500	13,500	62,350
2021-2030	42,000	4,200	19,500	59,500	20,250	145,450
Total	82,500	6,300	32,500	102,000	40,500	263,800
Additional Vehicle Parking Spaces						
2011-2015	3	0	2	6	1	11
2016-2020	2	0	1	9	2	14
2021-2030	6	0	3	21	2	32
Total	11	0	5	36	5	57
Additional Land Area (acres)						
2011-2015	1.9	0.0	0.8	1.5	0.6	4.9
2016-2020	1.6	0.2	0.3	2.3	1.2	5.4
2021-2030	3.6	0.4	1.7	5.3	1.7	12.7
Total	7.1	0.5	2.8	9.0	3.5	23.0

Source: WHPacific, Inc., 2011.

Aprons and Aircraft Parking

The FAA has developed an approach for determining the number of tiedowns needed for transient aircraft operating at an airport. The source of the methodology to determine the number of additional tiedowns needed in the future is *Airport Design*, Appendix 5:

1. Identify the increase in peak, or design, day operations
2. Divide by 2 (50% of operations are departures)
3. Multiply by 50% or 25% depending on aircraft type. Assume 50% of the fixed wing airplanes will be on the apron at the same time during the peak day. For helicopters use 25% to account for the higher ratio of operations per aircraft and other differences in helicopter usage.

The operations fleet mix and design day operations forecasts from Table 3Q were used to calculate the number of additional transient aircraft parking spaces needed. **Table 4I** shows that 25 additional transient parking spaces are needed over the 20-year planning period. The FAA recommends using a ratio of 360 square yards (3,240 sq. ft.) of transient tiedown apron per single engine piston aircraft. This apron area is 3.3 times larger than the footprint of the Cessna 172 (Table 4G) to account for spacing between aircraft and taxilanes. The 3.3 multiplier was applied to other example footprint areas from

Table 4G--turboprop (King Air), jet (Cessna Citation III), and helicopter (Bell 206B)--to determine apron area. To project the land area required for transient parking aprons, the apron area was multiplied by 1.5. Table 4I shows that from 2011 through 2030 25 additional transient parking places will be needed, requiring 187,780 square feet of apron and 6.5 acres.

Table 4I. Transient Tiedown Requirements

	Jet	Turboprop	Piston	Helicopter	Total
Additional Transient Aircraft Parking					
2011-2015	2	2	0	2	6
2016-2020	3	1	1	1	6
2021-2030	6	3	1	3	13
Total	11	6	2	6	25
Additional Apron Area (sq. ft.)					
2011-2015	19,600	15,760	0	8,740	44,100
2016-2020	29,400	7,880	3,240	4,370	44,890
2021-2030	58,800	23,640	3,240	13,110	98,790
Total	107,800	47,280	6,480	26,220	187,780
Additional Land Area (acres)					
2011-2015	0.7	0.5	0.0	0.3	1.5
2016-2020	1.0	0.3	0.1	0.2	1.5
2021-2030	2.0	0.8	0.1	0.5	3.4
Total	3.7	1.6	0.2	0.9	6.5

Source: WHPacific, Inc., 2011.

The amount of pavement needed for transient helicopter parking is actually less than shown in Table 4I, since helicopters can hover-taxi to parking positions. However, paving or otherwise controlling dust in the taxilanes and spaces between helicopter parking pads is recommended. While there are two helipads on private property, a public helicopter landing and takeoff area is needed on ODA property. Aurora State Airport has a considerable amount of helicopter traffic beyond that associated with tenants and through-the-fence helicopter operators. A new public helicopter takeoff and landing area with associated parking positions should be located to reduce potential conflict with fixed wing aircraft, enhance noise mitigation, and comply with the guidance in FAA Advisory Circular 150/5390-2B, *Heliport Design*.

The 2007 OAP recommends Category II airports have designated cargo aprons. A cargo apron for Aurora State Airport would need to be approximately 25,000 square feet to allow one of the larger Airplane Design Group II aircraft to taxi, turn, and maneuver on the ramp. This assumes truck loading/unloading on the ramp and no need for a cargo terminal building. The land area for this apron would be approximately 0.9 acres.

Aviation Businesses and Services

Excluded from the inventory of existing facilities in Chapter Two was the major heavy-lift helicopter charter business (Helicopter Transport Services) now building on 27.48 acres of privately owned land southeast of the Airport. Initially, about half the site will be developed, with a 126,000 square foot building, a heliport, and five helicopter parking positions. Undeveloped portions of the property will be available for Helicopter Transport Services expansion or other helicopter-related uses according to the zone change application approved by Marion County on March 10, 2010.

In addition to Helicopter Transport Services, other businesses are likely to establish or grow when and if the projected increase in based aircraft and aircraft operations occur. The projected based aircraft increase is 31% over the next 20 years. As discussed in Chapter Two, FBO services are provided by three vendors. At this time service from the existing FBOs is sufficient; however, growth in aviation activity may necessitate expansion of the existing businesses or even the establishment of a new FBO. A 31% increase in aviation activity would result in more revenue from fuel sales and other aviation services, probably more employees and vehicles, and possibly more building area devoted to repair and maintenance, pilot and passenger amenities, and flight training. More likely than the establishment of a fourth FBO would be the establishment of new specialized aviation service operators, providing specific aircraft repair or maintenance services.

Currently, AvGas and Jet A fuel is available for sale at the Airport from multiple vendors. To account for the additional fuel sales that would occur with the projected increase in aircraft operations, vendors may add storage tanks or increase the frequency of fuel deliveries. Fuel tanks owned by Aurora Aviation are located near the parallel taxiway, which is not ideal. A location convenient for truck deliveries would be better for fuel storage, and land near the parallel taxiway would be better used for aircraft. Consideration for relocating the fuel tanks once they have exceeded their useful life is recommended.

Estimating the additional building and land area that might be required to serve the additional aviation activity projected for the Airport is difficult, particularly considering that much of the growth will be on private property. Table 2B indicated 23% of the current buildings at the Airport contain businesses instead of aircraft storage. If the building area for new/expanded businesses equalled 23% of the additional based aircraft hangar area, the additional building area needed through 2030 would be approximately 60,700 square feet. The land area would be up to 7 acres to include land around buildings, aircraft and vehicular access, and adequate vehicular parking.

Air Traffic Control Tower (ACTC)

In April 2009, the FAA's Systems and Policy Analysis Division informed ODA that the Airport was eligible to apply for the Federal Contract Tower program based on its calculated 1.64 benefit/cost ratio. In the FAA's benefit/cost ratio, the denominator is the cost of air traffic controller staffing and the numerator sums the financial benefits from averted collisions, other accidents, and efficiency. The benefits increase over time with the FAA's Terminal Area Forecast for growth in based aircraft, general aviation aircraft operations, and air taxi operations. The 1.64 benefit/cost ratio is for a 15-year period; the calculated ratio exceeds 1.0 in the first year, and grows to over 2.0 in the fifteenth year. The FAA will

recalculate the ratio annually, and as long as the benefit/cost ratio remains over 1.0 and the program is funded, the FAA will fully fund personnel costs. The FAA will not fund the capital or operating costs of the tower. In 2010, the Oregon legislature awarded Aurora State Airport a $2.69 million grant for tower construction through the Connect Oregon III program.

Through this master planning process, and in conjunction with the FAA's Airport Facilities Terminal Integration Laboratory (AFTIL), ODA will be locating the ATCT site. Two acres are required for the building and its associated features (*i.e.*, parking lot, utility structures). For security purposes, the entire facility and parking must be enclosed with a fence. Alternative locations adequate for the ATCT will be identified in the development alternatives.

SUPPORT FACILITY REQUIREMENTS

Facilities and infrastructure that are not classified as airfield or landside are known as Support Facilities. The following support facilities were evaluated:

- Airport Access
- Emergency Services
- Airport Maintenance
- Airport Fencing
- Utilities
- Storm Drainage

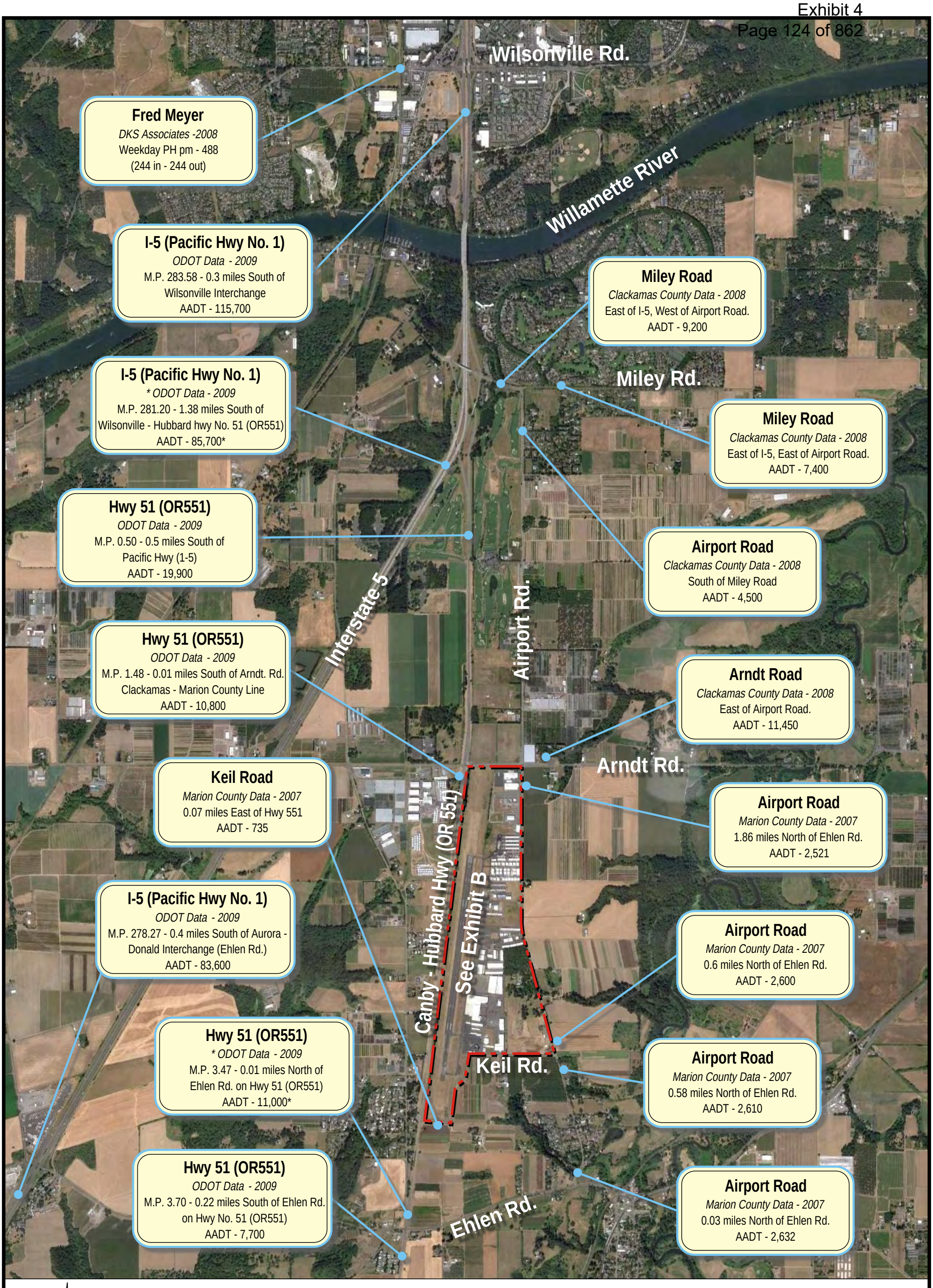
Airport Access

During the initial PAC meeting, several members expressed concern that the Master Plan process would not consider the automobile traffic impact to the surrounding roadways, specifically Airport Road and Interstate 5 (I-5) near Wilsonville. As a result, the following information has been incorporated in this Master Plan Update; data sheets and supplemental reports are included in **Appendix J**:

1. Traffic Count Information for the 11 Airport gates gathered by Oregon DOT (ODOT).
2. Traffic Count data from other available sources including Marion and Clackamas Counties, ODOT, DKS Associates, and Group Mackenzie.

ODOT's Transportation Data Section placed traffic counting tubes at the 11 gates at the Airport to determine the number of vehicles passing through the gates. The counters were placed on October 18, 2010 and removed on October 25, 2010. The Annual Average Daily Traffic (AADT) and Peak Hour traffic numbers were then generated. AADT represents the total number of vehicles traveling in both directions in a 24-hour period. The findings of this sampling is shown in **Table 4J**, as well as Exhibits **4B and 4C**.

Traffic count information, including the Rural Transportation System Plan 2005 update and the 2007 traffic count data, was obtained from the Marion County website. The Clackamas County website provided traffic data from the Comprehensive Plan with updates from January 17, 2008. Information for roads near the Airport is presented in **Table 4K and 4L**.



N

SCALE
1000 0 500 1000
(FEET)
1 INCH = 1000 FT.

AADT = Annual Average Daily Traffic
PH = Peak Hour

* - Automatic Counter

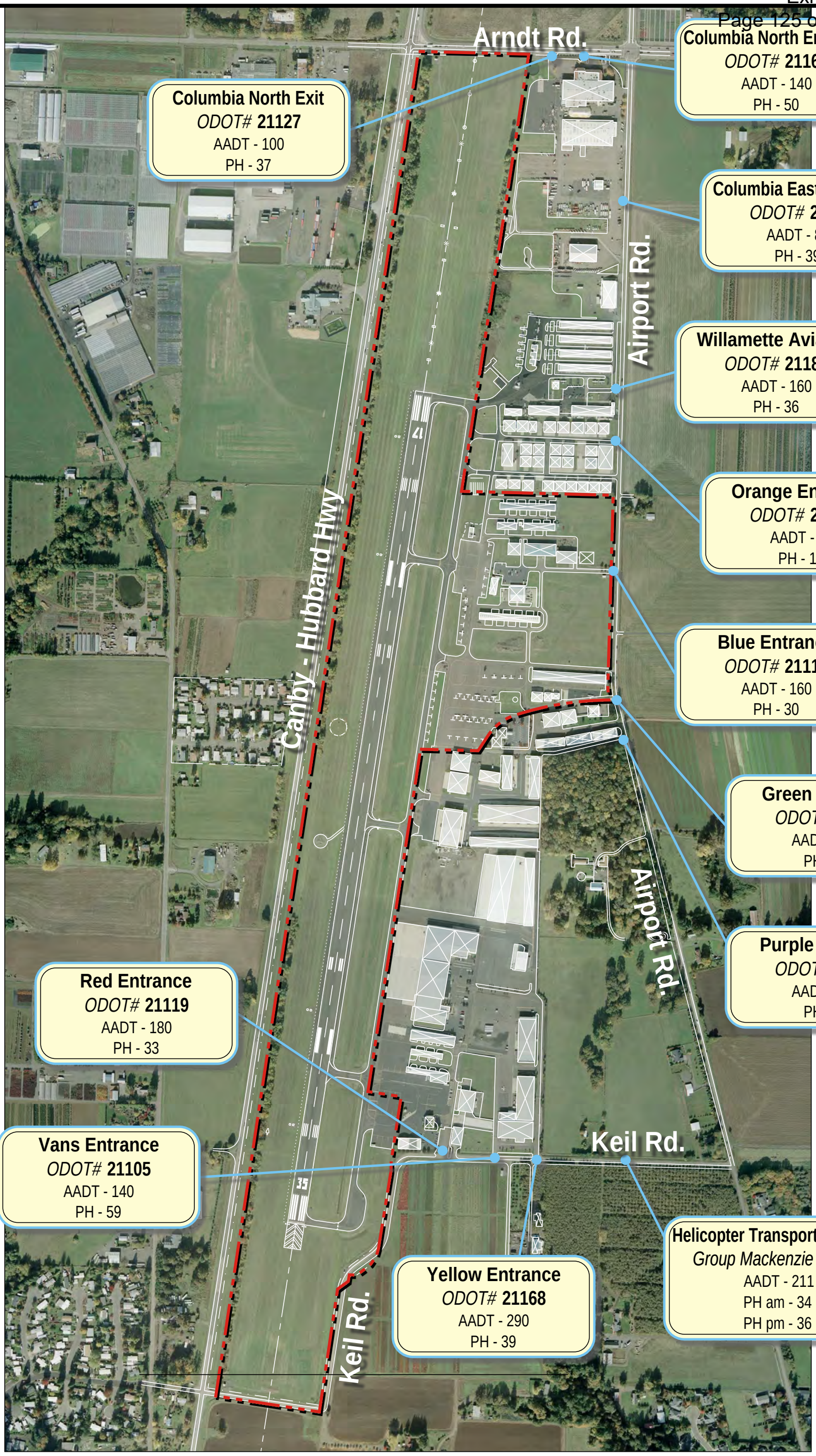
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Aurora State Airport
Aurora, OR

January 27, 2011

Exhibit 4B
Traffic Study

034317-C-EP02.DWG



N

SCALE
300 0 150 300
(FEET)
1 INCH = 300 FT.

AADT = Annual Average Daily Traffic
PH = Peak Hour

ODOT Data Collected 10/18/10 to 10/25/10

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Aurora State Airport
Aurora, OR

January 27, 2011

Exhibit 4C
Traffic Study

034317-C-EP02.DWG

Table 4J. Aurora State Airport Estimated AADT

Site number	Description	Estimated AADT	Peak Hour
21227	Columbia North Exit	100	37
21165	Columbia North Entrance	140	50
21157	Columbia East Entrance	890	396
21187	Willamette Aviation	160	36
21122	Orange Entrance	70	15
21114	Blue Entrance	160	30
21160	Green Entrance	140	29
21159	Purple Entrance	130	33
21168	Yellow Entrance	290	39
21105	Van's Entrance	140	59
21119	Red Entrance	180	33
	Total	**2,400**	

Table 4K. Marion and Clackamas Counties Roadway AADT

Marion County			
Road	**Description**	**AADT (2007)**	**Functional Classification**
Airport Road	0.30 miles north from Ehlen Rd	2,632	Major Collector
	0.58 miles from Ehlen Road (south of Keil Rd)	2,610	
	0.60 miles from Ehlen Road (north of Keil Rd)	2,600	
	1.86 miles from Ehlen Road (south of Airport Rd)	2,521	
Keil Road	0.07 miles from Hwy 551	735	Local
	0.89 miles from Hwy 551 (west of Airport Rd)	720	
Arndt Road	0.01 miles west of Airport Road	10,062	Local
	0.24 miles from Airport Rd (east of Hwy 551)	9,500	
	0.26m from Airport Rd (west of Hwy 551)	2,500	
Ehlen Road	west of Airport Rd	8,408	Arterial
	east of Airport Rd	9,500	
Clackamas County			
Road	**Description**	**AADT (2008)**	**Functional Classification**
Arndt Road	east of Airport Rd	11,450	Major Arterial
	Airport Rd (south on Miley Rd)	4,500	
Miley Road	east of Airport Rd	7,400	Collector
	east of I-5	9,200	Minor Arterial

Source: Marion County Rural Transportation System Plan 2005 and website and Clackamas County Comprehensive Plan 2004 and website.

As Table 4K illustrates, the AADT of the Airport Entrances represent a large portion of Airport Road's and Keil Road's AADTs.

Marion County roads are designed to accommodate certain levels of activity, as shown in Table 4L. As reported, many of the roadways within Marion County are currently exceeding the AADT to which the road was designed. Clackamas County does not design roads based on roadway volume; the qualitative design definition for Clackamas County roads indicates Arndt Road and Miley Road generally conform with the definition given.

Table 4L. Design Standards for Functional Classification

Functional Classification	Typical AADT	Definition
Marion County		
Arterial	1,000 - 10,000	A roadway intended to carry large volumes of traffic and connect major traffic generators, cities, recreational areas, and major segments of transportation networks. High capacity is achieved through allowing higher speed, limited access, wider roadway and movement preference at intersections with lesser standard roadways.
Major Collector	500 - 1,500	A roadway intended to carry intermediate volumes of traffic and collect and distribute traffic from local streets to arterials, state highways or small population centers.
Local	0 - 500	A roadway serving short distance, intra-neighborhood and residential needs. They are characterized by minimal access limitations, lowest traffic movement preference at intersections with collectors and arterials, and minimum widths. These factors lead to minimum traffic carrying capacity, but provide maximum access to adjacent property.
Clackamas County		
Major Arterial	--	Carries local and through traffic to and from destinations outside local communities and connects cities and rural centers. Moderate to heavy volume; moderate to high speed.
Minor Arterial	--	Connects collectors to higher order roadways. Carries moderate volume at moderate speed.
Collector	--	Principle carrier within neighborhoods or single land use areas. Links neighborhoods with major activity centers, other neighborhoods, and arterials. Generally not for through traffic. Low to moderate volume; low to moderate speed. New collectors should intersect minor arterials rather than major arterials.

Source: Marion County Public Works (2005) and Clackamas County Roadway Standards (2010).

Data for roads under the jurisdiction of ODOT was also obtained. **Table 4M** presents the AADT for both Interstate 5 and Highway 551. While the Airport influences Airport and Keil Roads, the Airport's impact to the ODOT roadways is minimal.

Table 4M. ODOT Roadway AADT

Road	Description	Milepost	AADT (2009)	Functional Classification
Interstate 5 (I-5)	0.4 miles south of Aurora Donald Interchange (Ehlen Rd)	278.27	83,600	Freeway
	1.38 miles south of Hwy 551	281.20	85,700	
	0.30 miles south of Wilsonville Interchange	283.58	115,700	
Highway 551	0.22 miles south of Ehlen Rd	3.70	7,700	Highway
	0.01 miles north of Ehlen Rd	3.47	11,000	
	0.01 miles south of Arndt Rd	1.48	10,800	
	0.50 miles south of I-5	0.50	19,900	

Source: ODOT website traffic counts.

The Helicopter Transport Services (HTS) Transportation Impact Analysis prepared by Group Mackenzie in May 2009 and the Fred Meyer Transportation Impact study in Wilsonville prepared by DKS Associates in August 2008 were obtained for comparative purposes. The HTS analysis reported an AADT of 211, with a morning peak hour of 34 and evening peak hour of 36. These results are typical of other Airport entrances. The Fred Meyer traffic study did not produce an AADT; however, the weekday afternoon peak hour was 488 (244 in and 244 out).

Aurora State Airport Traffic Summary. As stated above, a total of 11 gates (driveways) at the Airport were surveyed and the AADT and peak hour traffic volumes determined. The total AADT of all 11 gates equaled 2,400, plus the projected 211 AADT from HTS when their development is completed in 2011, for a total from the Airport of 2,611 AADT. It should be noted that the three Columbia Helicopters' gates contribute 1,130 AADT or 47% of the total airport-generated vehicular traffic volume. Columbia Helicopters' main activity is helicopter maintenance and support activities that do not rely on the runway and taxiway system or generate similar numbers of operations as the majority of the other airport businesses or FBOs.

Airport Road traffic Summary. As noted in Table 4K, the 2007 Marion County data indicates that approximately 2,600 vehicles travel along Airport Road between Ehlen Road and Arndt Road, utilizing it as a cut through between the City of Aurora and Hwy 551/I-5. According to Karen Odenthal, Marion County Planner, this data will be updated in 2011 and the numbers are anticipated to increase.

Aurora State Airport Vehicular Traffic Impact to the Boone Bridge. Assuming 75% of the Airport-generated traffic travels north and south on I-5 the Airport's impact to would equate to 1,800 AADT out of the 115,700 AADT as indicated by the ODOT counter just north of the Boone Bridge – or .015% of the AADT for I-5 at that location. The current employment numbers at the Airport are estimated to be approximately 750, which equates to 3.2 trips per employee. If a 1.19% employment growth rate (based on the Employment Model in Chapter Three, *Forecasts*, pg 3-21) is applied, the total employment in 2030 will be 950, which would equate to an Airport-generated AADT 0f 3,040; still an

insignificant impact when compared to that of a development such as a Fred Meyers with a peak hour volume of 488 vehicles to the roadway system.

Future Roadway improvements. Numerous improvements to the roadway transportation systems in the airport environs have been identified by the various agencies.

- **Marion County.** Ehlen Road at Boones Ferry and Highway 551, add a left turn lane on Ehlen Road; possible realignment; and possible traffic signal at Boones Ferry to be coordinated with State Highway signal.

  Airport Road is currently designated by Marion County as a Major Collector and is a two lane road with narrow shoulders and no pedestrian or bike lanes. According to Karen Odenthal, on January 25, 2011, Marion County is planning to update its Transportation System Plan. Ms. Odenthal indicated that improvements to Airport Road would likely be identified and a general recommendation would be made to widen the travel lanes, shoulders and add pedestrian/bike lanes. She was, however, uncertain as to the priority the potential project would be given.

- **City of Aurora.** Ehlen Road and Airport Road intersection, add a signal and a left turn lane eastbound on Ehlen Road to Airport Road northbound.

- **ODOT.** Ehlen Road and Hwy 551, signal improvements, left turn lane southbound to Ehlen Road, and coordinated improvements with Marion County. Highway 551 and Keil Road, possible left turn lane southbound along Hwy 551 to Keil Road.

- **Clackamas County.** Airport Road at Miley Road intersection, realign, add turn lanes and install signal. Airport Road between Arndt road and Miley Road, reconstruct and widen to rural standards.

Recommendations. It is recommended that ODA continue to work with and support Marion County and the City of Aurora as improvements to Airport Road are considered. It will be important that appropriate considerations be given to the entrances (gates) to the Airport and business along Airport Road. The question of funding these improvements should be part of the discussions and it is appropriate that future development, both public and private, participate on a similar proportionate share as HTS recently has; see Group Mackenzie report, HTS 2009 pgs 14 and 17 in Appendix J.

Emergency Services

The Marion County Sheriff Department and Oregon State Police provide emergency services at the Airport, since it is located within Marion County and also owned by the State of Oregon. For large-scale emergencies that have a regional or statewide impact, Marion County has entered into an Inter-County Mutual Aid Agreement, wherein other counties would be available to respond.

The Aurora Rural Fire Protection District (District) provides fire protection. A 500,000-gallon fire suppression system was recently installed to assist the District in protecting the Airport. There are no Aircraft Rescue and Firefighting (ARFF) facilities available at the Airport. The District was contacted to

solicit their concerns relating to the Airport. The foremost concern is to have a place at the Airport to house the District's airport fire response apparatus. The building needs only to accommodate a crash truck and a quick response medical unit. For planning purposes, a 2,000-square foot building on a 0.2-acre site should be adequate. The District's preference for the location is near the ATCT or near the fire water pump site.

Airport Maintenance

Airport maintenance is adequately provided by ODA and the Oregon Department of Transportation (ODOT). ODA provides snow removal services. No changes are recommended

Airport Fencing

Fencing surrounds the perimeter of the Airport Environs. All access points have gates, although not all gates are automated. It is advised that the non-automated gates be upgraded.

Utilities

Utilities available at the Airport include electricity, water, septic, and telephone. Septic needs are met by individual septic tanks and drain field systems. New septic systems will be required for buildings with sanitary facilities, and may limit growth potential at the Airport until sewer service is provided. The lack of sewer service is a particular problem for establishing food service facilities. Extensions of electricity, water, and telephone to future facilities will be required as needed. The City of Aurora has express concerns that additional groundwater wells or expansion of water facilities at the Airport will have negative impacts upon the City's current water supply. Drinking water quality is also a concern for the City. Continued development and/or potential expansion of airport facilities without proper advanced planning and feasibility assessments regarding the Airport's ability to meet water, sewer, and fire protection needs concerns the City.

Storm Drainage

The need for additional hangars, other buildings, aprons, and airfield pavements has been identified. These facilities will increase the Airport's existing impervious surfaces. These additional surfaces must be evaluated to ensure that the requirements of the 1200-Z[15] stormwater discharge permit are met. Because a specific layout for future development has not been defined yet, the exact amount of increased impervious surface is to be determined. The alternatives analysis will provide additional details regarding stormwater impacts of each alternative. The analysis will also include Department of Environmental Quality (DEQ) requirements, water treatment, and detention.

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[15] *The federal Clean Water Act mandates jurisdictional control of the quality of stormwater runoff. This mandated program is found in the Code of Federal Regulation part 122.26. The Airport may fall under the scope of these regulations and may need to apply for a National Pollution Discharge Elimination Permit (NPDES) for the discharge of rain water to the surface water system. In Oregon, this is typically referred to as a 1200-Z General Permit.*

Environmental review of individual development will be required to meet National Environmental Policy Act regulations where federal funding is used. All state and local regulations will be addressed, as required.

AIRSPACE

Currently the airspace surrounding the Airport is Class E, which has no communications requirements. The FAA has accepted the justification provided by ODA for an air traffic control tower and ODA has secured funding for its construction. When the ATCT is operational the airspace around the Airport will change to Class D. Class D has communications requirements and the ATCT will provide sequencing and traffic advisories to VFR aircraft operating into and out of the Airport, and IFR traffic separation. Most likely the ATCT will only operate part-time (closed at night), at which time the airspace will go back to Class E. ODA should coordinate with FAA regarding the airspace changes and help educate pilots of the new operating requirements.

LAND USE PLANNING & ZONING RECOMMENDATIONS

In general, the Airport meets State and County land use requirements. Even so, the ODA and Marion County should work towards several items regarding land use and zoning around the Airport. Recommendations are provided below.

Zoning Code

- ODA should consider working with Marion County to rezone the underlying designations within the Airport property as "Airport" to ensure that only compatible uses occur within the Airport property boundary. The rezoning would be based on Oregon Administrative Rules Division 13, *Airport Planning*, which provides guidelines for local government land use compatibility to encourage and support the continued operation and vitality of Oregon's airports.
- Marion County should consider adopting the standards of ORS 836.616, which authorizes certain airport uses and activities to occur at the Airport.
- A portion of the Airport Overlay, which protects FAR Part 77 Imaginary Surfaces, extends into Clackamas County. The Overlay should be maintained and updated as needed based on any airport layout changes recommended in this Master Plan.

Comprehensive Plan

- If Marion County adopts this Master Plan, it would adopt it as a component of the Marion County Comprehensive Plan and all projects identified within the Plan would receive "conditional use" approvals for development. As such, a Traffic Impact Analysis would be necessary for any projects that would have a significant impact on area ground transportation, prior to the County's adoption, in order to meet Statewide Goal 12. Alternatively, ODA could not submit the Plan to Marion County and instead apply for conditional approvals for individual projects. The advantages and disadvantages of these options will be further discussed in Chapter Five as development alternatives are identified.

- Adopt a title notice or similar requirement to inform purchasers of property within one mile of the Airport that their property is located adjacent to or in close proximity to the Airport and their property may be affected by a variety of aviation activities. Note that such activities may include but are not limited to noise, vibration, chemical odors, hours of operations, low overhead flights, and other associated activities.

Chapter Five: AIRPORT DEVELOPMENT ALTERNATIVES

Airport Master Plan Update

Aurora State Airport

The preceding chapter identified shortfalls of the Aurora State Airport (Airport) with respect to existing and anticipated aeronautical demand, which are consistent with current Federal Aviation Administration (FAA) design standards, along with industry and State of Oregon development guidelines. This chapter presents three development alternatives that focus on meeting the Airport's facility needs for the long-term future, along with the No Build Alternative.

The purpose of the build alternatives is to provide variations of how to meet forecasted demand, while the No Build Alternative serves as a baseline for comparison. The Oregon Department of Aviation (ODA) – with input from the FAA, Planning Advisory Committee (PAC), and public – will select a Preferred Alternative that will serve as the foundation for the Airport Layout Plan (Chapter 6). The Preferred Alternative will likely be a combination of elements from the alternatives.

The alternatives should be evaluated using the Master Plan Goals and Issues identified in Chapter 1, which were produced with PAC and public input.

SUMMARY OF FACILITY REQUIREMENTS

The following section summarizes the development recommendations given in Chapter 4, *Facility Requirements*, needed to accommodate forecasted aeronautical activity.

Airfield Requirements

- The Airport currently meets design standards for an Airport Reference Code (ARC) of B-II and C-II, with approach criteria minimums not lower than 1 statute mile (sm). As depicted in Table 4C, many design standards are deficient for ARC C-II, which represents the current and future critical aircraft. Table 4C also shows deficiencies if the Airport's instrument approach capability is improved (approach minimums are lowered).

- The runway length analysis demonstrated it is prudent to plan[1] for a runway extension now, based on aircraft currently operating and forecasted to operate at the Airport. Accordingly, two of the build alternatives show a runway extension, to a total length of 5,604 or 6,004 feet.

- The current runway strength of 45,000 pounds (dual-wheel gear) is adequate for the existing runway length, as several of the heavier aircraft operating at the Airport are constrained (*i.e.*, reduced fuel load or payload). However, with a runway extension it is recommended the pavement strength be increased to 60,000 pounds (dual-wheel gear), which is the same pavement strength as the parallel taxiway.

- If the instrument approach capability were improved to lower than ¾ sm visibility, then the parallel taxiway would need to be relocated another 100 feet east of the runway to satisfy design standards.

- It is recommended the approach lighting system be upgraded to a precision approach path indicator (PAPI).

- An upgraded instrument approach lighting system is recommended if an approach with minima lower than ¾ sm visibility is selected.

- ODA should establish departure procedures for Runway 17/35, to avoid flight over noise-sensitive areas, and change the altitude limit on left turns when departing Runway 35. (Note: ODA is working with FAA to create these procedures and they should be published in the fall of 2011.)

Landside Requirements

- To meet 2030 hangar demand, approximately 23.0 acres will be needed.

- 25 aircraft parking positions, or approximately 6.5 acres, will be needed for aprons and aircraft parking by 2030.

- A cargo apron is recommended, which requires approximately one acre of land.

- Expansion of a current fixed base operator (FBO) or establishment of a new FBO will likely be needed.

- Fuel tanks owned by Aurora Aviation should be relocated once they have exceeded their useful life, as the current location could better be used for aircraft-related uses. Off-airport operators may want to consider impacts of current fuel tank location and their impacts from future demand

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[1] *Planning for a runway extension does not give justification for federal funding. Based on the number of aircraft operations constrained by runway length projected into the future, justification for funding should occur within the 20-year planning period, although not within the next five years.*

- Approximately 2 acres of land should be reserved for the air traffic control tower (ATCT), parking and security requirements.

- A suitable location for the facility the Aurora Rural Fire Protection District wants to locate at the airport should be identified.

- ODA will work with and support Marion County and the City of Aurora as improvements to Airport Road are considered. The question of funding these improvements should be part of the discussions.

AIRPORT DEVELOPMENT ALTERNATIVES

Four alternatives for the long-term future of the Airport are presented in this chapter. Generally speaking, the alternatives can be described as such:

- The No Build Alternative assumes maintenance of existing facilities and no expansion of airfield or landside facilities on State-owned property. The Airport would remain designed to ARC B-II standards (approach minima to remain at visual and greater than 1 sm). Adjacent, through-the-fence operators would still have the option to develop their property as the market demands.

- Build Alternative 1 includes a 600-foot extension to the north end of the runway and an instrument approach with visibility greater than 1 sm. The ARC would remain B-II in this alternative.

- Build Alternative 2 incorporates a 1,000 feet extension to the south end of the runway and improved instrument approach capability (visibility greater than ¾ sm). This alternative reflects improvements to meet the design standards for ARC C-II.

- Build Alternative 3 depicts ARC C-II and instrument approaches with visibility minima lower than ¾ sm (precision approaches). No runway extension is shown on this alternative. However, in order to meet ARC C-II standards, with the lower instrument approach, the parallel taxiway would be relocated 100 feet to the east and multiple buildings would need to be removed or altered.

In addition to these components, the three development alternatives depict additional hangar and apron expansions, area for helicopter operations on State-owned property, future fuel tank locations, and ATCT locations, among other items. As stated previously, there is an approximate need of 40 developable-acres to meet forecasted demand. Currently, ODA only has approximately nine acres of developable land, indicating development will be on a combination of public and private lands. The build alternatives focus on building aircraft storage and parking, ATCT, and the Fire District's facility. The land allowances for these facilities is approximately three to four times the building floor or individual vehicle/aircraft parking area, to account for circulation, fire separation and so on; however, the land allowance may not be enough for septic fields allowance.

The remaining demand will likely be met by private property owners and developers. Development of the Southend Airpark is shown on all build alternatives, based on the current site plan provided to the consulting team. However, actual development of Southend Airpark is dependent upon market demand, and is subject to change as needed. Including Southend Airpark, there are approximately 26 acres of privately-held developable land.

Combining nine acres of undeveloped State-owned property and 26 acres of undeveloped private property currently zoned for airport use, there is a shortfall of approximately 5 acres needed for airport-related development over the next 20 years. In all of the build alternatives, adjacent property is shown to be suitable for airport-related development. This area incorporates approximately 16 acres. This land, now used as a church camp, is not currently zoned Public in the Marion County Zoning Code; however, its location is immediately adjacent to existing airport development and the new Helicopter Transport Services (HTS) development.

Following is a discussion relative to each alternative.

No Build Alternative

Exhibit 5A illustrates the No Build Alternative. By showing the consequences of not developing the Airport, ODA – along with the FAA, PAC and public – can assess the advantages and disadvantages of the development alternatives.

As shown in Chapter 3, *Aeronautical Activity Forecast*, the Airport is expected to experience increased demand. If no development were to occur, the Airport would not be able to support forecasted aeronautical uses and demands. PAPIs, a cargo apron, helicopter parking, vehicle transportation scheme and additional hangars would not be built on State-owned property. The safety enhancements of an ATCT and a building for the Fire District to house emergency response vehicles would not occur. As such, the No Build Alternative would not optimize the Airport's potential.

While the No Build alternative is essentially a do-nothing option, it does not mean that there would be no financial impact to the Airport. Most prominently, there would still be a cost associated with maintaining the current pavements and facilities.

Development of private property, adjacent to the Airport and zoned Public, would be permitted – consistent with local and State regulations.

Build Alternative 1

Build Alternative 1 includes a 600-foot runway extension to the north. Instrument approach capability does not change (not lower than 1 sm visibility minima). **Exhibit 5B** illustrates this alternative. The change to the Airport's footprint would be a slightly larger area for easement acquisition to control building height west of the runway extension, in addition to identifying 16 acres of adjacent land suitable for airport-related development. The Runway 35 RPZ extends south of Keil Road and an avigation easement would be sought; however, this is no different from the existing condition.

Airfield. Airfield developments for Alternative 1 are outlined below.



Jan 18, 2011

N

SCALE
300 0 150 300
(FEET)
1 INCH = 300 FT.

Legend

- Property Line
- BRL — 35' Building Restriction Line
- RSA — Runway Safety Area
- ROFA — Runway Object Free Area
- TOFA — Taxiway Object Free Area
- Existing Buildings
- Future Buildings
- Existing Building Removal

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Aurora State Airport
Aurora, OR

Exhibit 5A
No Build Alternative

034317-AIRP-EX5A.DWG



01/19/11

N

SCALE
300 0 150 300
(FEET)
1 INCH = 300 FT.

Legend

- Property Line
- Future Property Line
- BRL — 35' Building Restriction Line
- RSA — Runway Safety Area
- RROFA — Runway Object Free Area
- TROFA — Taxiway Object Free Area
- Future Paved
- Existing Buildings
- Future Buildings
- Air Traffic Control Tower (ATCT)
- Aurora Rural Fire Protection District
- Future Apron Area
- Vehicular Parking
- Hangar Development
- Fuel Station
- Helicopter Parking
- Precision Approach Path Indicator (PAPI)
- Existing Building Removal

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Aurora State Airport
Aurora, OR

Exhibit 5B
Build Alternative 1

034317-AIRP-EX5B.DWG

- Runway 17 and parallel taxiway extension of 600 feet.
- Pavement would be strengthened to 60,000 pounds (dual-wheel gear).
- Instrument approach minimums not lower than 1 sm. This approach would be no change from the current design standards for ARC B-II, which includes the runway protection zone (RPZ).
- Designation of helicopter operations area in the northwest section of State-owned property.
- Installation of PAPIs.
- Hold area located off the parallel taxiway at the Runway 17 end.

Landside. The landside development features proposed in Alternative 1 include:

- ATCT located midfield on the east side.
- Majority of State-owned property to be developed as hangars.[2]
- Fire District's response building located near the ATCT.
- Fuel tank relocation shown south of Aurora Aviation.
- Adjacent land identified as suitable for airport-related development under private ownership, approximately 16 acres.

Build Alternative 1 has the potential to meet the forecasted demand for the Airport, with rezoning and development of the additional 16 acres of privately owned land east of the Airport.

Build Alternative 2

Build Alternative 2 includes upgrading to ARC C-II standards, extending the runway 1,000 feet to the south, and improving the instrument approach capability to visibility minimums lower than 1 sm but greater than 3/4 sm (see **Exhibit 5C**).

Airfield. Airfield development in Alternative 2 includes:

- Runway and parallel taxiway extension to the south of 1,000 feet, which would require the closure of Keil Road.
- The larger RPZs would require additional avigation easements or land acquisition.
- Pavement would be strengthened to 60,000 pounds (dual-wheel gear).
- Implementation of instrument approaches with minimums greater lower than ¾ sm and installation of approach lighting systems, as recommended by the FAA
- Designation of helicopter operations area, situated where the fuel tanks are currently located.
- Installation of PAPIs.

The runway extension would accommodate nearly all business jets with ARC C-II and below that could potentially operate at the Airport. Keil Road would be dead-ended, with no access to Highway 551. Access would be rerouted, most likely connecting with Ehlen Road. No frontage would be removed.

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[2] *Detailed vehicular access/traffic schemes for hangar development areas are not shown on the individual alternatives. A detailed plan will be developed for the Preferred Alternative.*

Landside. Alternative 2 consists of the following landside developments:

- Designation of a cargo apron facility, north of Aurora Aviation.
- Internal service road.
- ATCT centrally located within State-owned property, but north of the location in Alternative 1.
- Fuel tanks relocated northeast of Aurora Aviation.
- Fire District's response building located adjacent to the water suppression system.
- Development of hangar area and apron area on State-owned property.
- Adjacent land identified as suitable for airport-related development under private ownership, approximately 16 acres.

Build Alternative 2 has the potential to meet the forecasted demand for the Airport, with rezoning and development of the additional 16 acres of privately owned land east of the Airport.

Build Alternative 3

Development Alternative 3 depicts precision approaches (minimums lower than ¾ sm), with ARC C-II. No runway extension is shown for Build Alternative 3. However, relocation of the parallel taxiway is necessary, along with the removal and alteration of several buildings, to meet design standards. Build Alternative 3 is illustrated by **Exhibit 5D**. With a precision approach, the building restriction line[3] moves 250 feet farther from the runway than where it is located with the other alternatives.

Airfield. Alternative 3 has the following airfield features:

- Parallel taxiway relocation 100 feet to the east.
- Implementation of an instrument approach with minimums lower than ¾ sm.
- The larger RPZs would require additional avigation easements or land acquisition.
- Closure of Keil Road, due to increased design standard requirements.
- The building restriction line would extend to include many airport buildings, as well as private residences west of Highway 551.
- Installation of approach lighting, as required by the FAA.
- Designation of helicopter operations area, north of the current apron.

Landside. Significant landside developments within Alternative 3 are:

- ATCT located closer to the north end and farther from the runway than in the other two build alternatives.
- On State-owned land, more focus on apron areas than on any of the other alternatives.
- The Fire District's response building located east of the fire suppression system.

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[3] *The building restriction line parallel to the runway is the point where the imaginary transitional surface is 35 feet higher than the runway. The transitional surface slopes up at 7:1 from the edge of the imaginary primary surface. The primary surface is centered on the runway and is 1,000 feet wide if the runway has a precision approach. The source of information for these imaginary surfaces is Title 14 of the Code of Federal Regulations, Part 77, Safe, Efficient Use, and Protection of Navigable Airspace.*



Mar 25, 2011

SCALE
400 0 200 400
(FEET)
1 INCH = 400 FT.

Legend

- Property Line
- Future Property Line
- BRL — 35' Building Restriction Line
- RSA — Runway Safety Area
- ROFA — Runway Object Free Area
- TOFA — Taxiway Object Free Area
- Service Road
- Existing Buildings
- Future Buildings
- Future Paved
- Air Traffic Control Tower (ATCT)
- Aurora Rural Fire Protection District
- Future Apron Area
- Cargo Apron
- Vehicular Parking
- Hangar Development
- Fuel Station
- Helicopter Parking
- Precision Approach Path Indicator (PAPI)
- Existing Building Removal
- Existing Road Removal

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Aurora State Airport
Aurora, OR

Exhibit 5C
Build Alternative 2

03437-AIRP-EX5C.DWG



Mar 25, 2011

SCALE
400 0 200 400
(FEET)
1 INCH = 400 FT.

Legend

- Property Line
- BRL — 35' Building Restriction Line
- RSA — Runway Safety Area
- ROFA — Runway Object Free Area
- TOFA — Taxiway Object Free Area
- Future Paved
- Existing Buildings
- Future Buildings
- Air Traffic Control Tower (ATCT)
- Aurora Rural Fire Protection District
- Future Apron Area
- Cargo Apron
- V — Vehicular Parking
- Hangar Development
- F — Fuel Station
- H — Helicopter Parking
- ■ — Precision Approach Path Indicator (PAPI)
- Existing Building Removal
- Existing Road Removal

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Exhibit 5D
Build Alternative 3

03437-AIRP-EX5D.DWG

- The cargo apron centrally located on State-owned property Future fuel tanks located at the south end of State-owned property.
- Adjacent land identified as suitable for airport-related development under private ownership, approximately 16 acres.
- Power lines located along Arndt Road relocated or buried, as they would be a hazard to air navigation.

While Build Alternative 3 shows the development of an additional 16 acres, it has less potential to meet the forecasted demand for the Airport. This is due to the loss of buildable land within the new building restriction line, which prohibits and/or limits development of facilities.

COMPARISON OF ALTERNATIVES

Detailed costs estimates were not prepared for each alternative; however, the alternatives are compared in order of magnitude costs. The No Build Alternative has the least cost associated with it, as costs only represent maintenance of existing facilities. Of the build alternatives, Alternative 1 is the least costly since its runway extension is less than what is shown in Alternative 2, and there is less land acquisition/easement required than with the other build alternatives. Alternative 2 has the mid-level financial cost of the build alternatives, due to the runway extension and additional requirements for land acquisition and easements. Alternative 3 is the most costly alternative, as it requires relocation of the parallel taxiway, the most land acquisition and easements, removal and relocation of businesses and residences, and relocation of the power lines located along Arndt Road.

Runway length would remain at 5,004 feet for the No Build Alternative and Build Alternative 3. The runway length would be 5,604 feet for Alternative 1 and 6,004 feet for Alternative 2. Land acquisition to the taxiway object free area (OFA) would be required for the extension shown in Alternative 1, while Alternative 2 would require acquisition to the extended runway OFA. Since they show no runway extensions, the No Build Alternative and Build Alternative 3 would keep the pavement strength rating at 45,000 pounds (dual wheel gear). On the other hand, Build Alternatives 1 and 2 would allow use by heavier aircraft (up to 60,000 pounds dual wheel gear).

Alternative 1 would keep the same approach minima – and therefore the same design standards – as what is currently at the Airport. Approach minima of greater than ¾ sm and lower than ¾ sm are included in Alternatives 2 and 3, respectively. Generally speaking, the better the instrument approach, the lower the visibility minima, and the larger the RPZ that ODA would need to control by means of acquisition or avigation easement. Additionally, the approach minima given for Build Alternative 3 would require reconstruction of the parallel taxiway 100 feet to the east, as well as removal and alteration of facilities penetrating the Airport's primary and transitional surfaces[4].

[4] *Primary and transitional surfaces are defined in FAR Part 77, Imaginary Surfaces. Further definition will be given in Chapter 6.*

Helicopter operations, which currently do not have a designated area on State-owned property, would be accommodated in all of the build alternatives near the Airport's mid-point.

As recommended, alternative sites for Aurora Aviation's fuel tanks were identified in each of the build alternatives. Relocation of the existing fuel tanks is only recommended once the tank's useful life has been exceeded.

All alternatives identify adjacent property that would be suitable for airport-related development. Prior to any development of the property, the appropriate land use approvals must be undertaken.

As development potential for the nine acres of State-owned land is limited, much of the development needed to meet forecasted demand will have to occur on privately-held lands. Consequently, it remains imperative that ODA administer through-the-fence agreements consistent with federal guidelines and state statutes, that not only promote development but that also protect the public investment. Chapter 7, *Capital Improvement Plan*, will further discuss this issue.

NOISE ANALYSIS

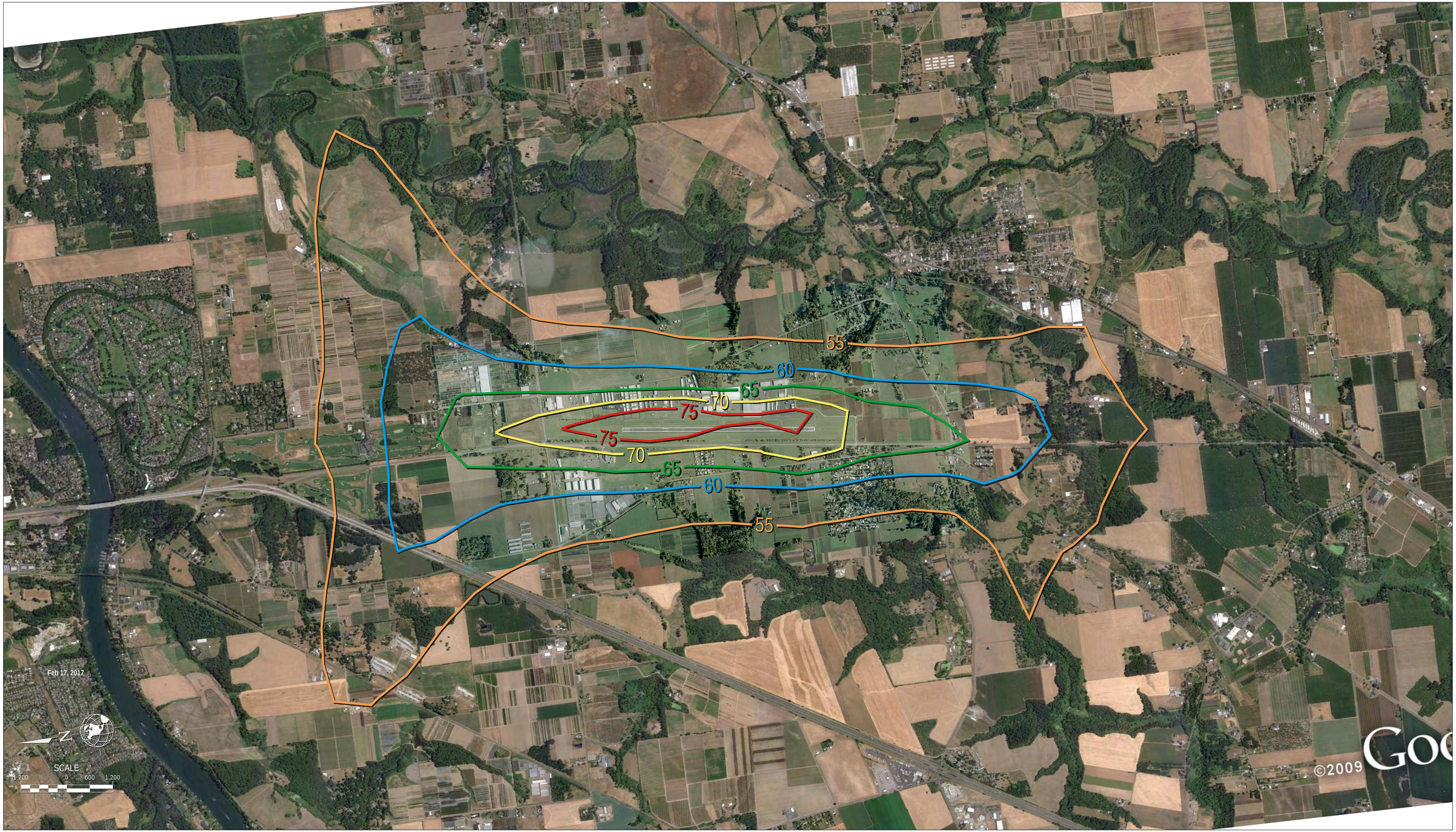
A noise analysis was completed for all alternatives. The study was performed in accordance with FAA regulations using the Integrated Noise Model (INM) version 7.0. All airport noise was assessed in terms of the yearly day-night average sound level (YDNL) contours. The FAA's INM is widely used by the civilian aviation community for evaluating aircraft noise impacts in the vicinity of airports. INM is an average-value model and is designed to estimate long-term effects using average annual input conditions. Under the FAA criteria, residential land use is not considered compatible with annual day-night noise levels that meet or exceed 65 dBA.

Four separate noise contour exhibits were prepared:

- Existing Noise Contours (2010) – **Exhibit 5E**
- No Build Alternative Noise Contours (2020) – **Exhibit 5F**
- Build Alternative 1 Noise Contours (2020) – **Exhibit 5G**
- Build Alternative 2 Noise Contours (2020) – **Exhibit 5H**

The existing noise contours are meant to be a baseline for comparison of all proposed alternatives. The remaining exhibits present the expected noise contours in 2020. A separate exhibit for Build Alternative 3 (2020) was not prepared, as it reflects the same physical layout of the No Build Alternative Nose Contours (Exhibit 5F).

Tables 5A and 5B present the assumptions used for the analysis for years 2010 and 2020, respectively. The aircraft fleet was determined by using the information provided by the Harris, Miller, Miller & Hanson (2002) noise study conducted for ODA. The aircraft shown are representative of aircraft within each sub-group (*i.e.*, turboprop, small prop, jets, etc.). The data used for operations is from the



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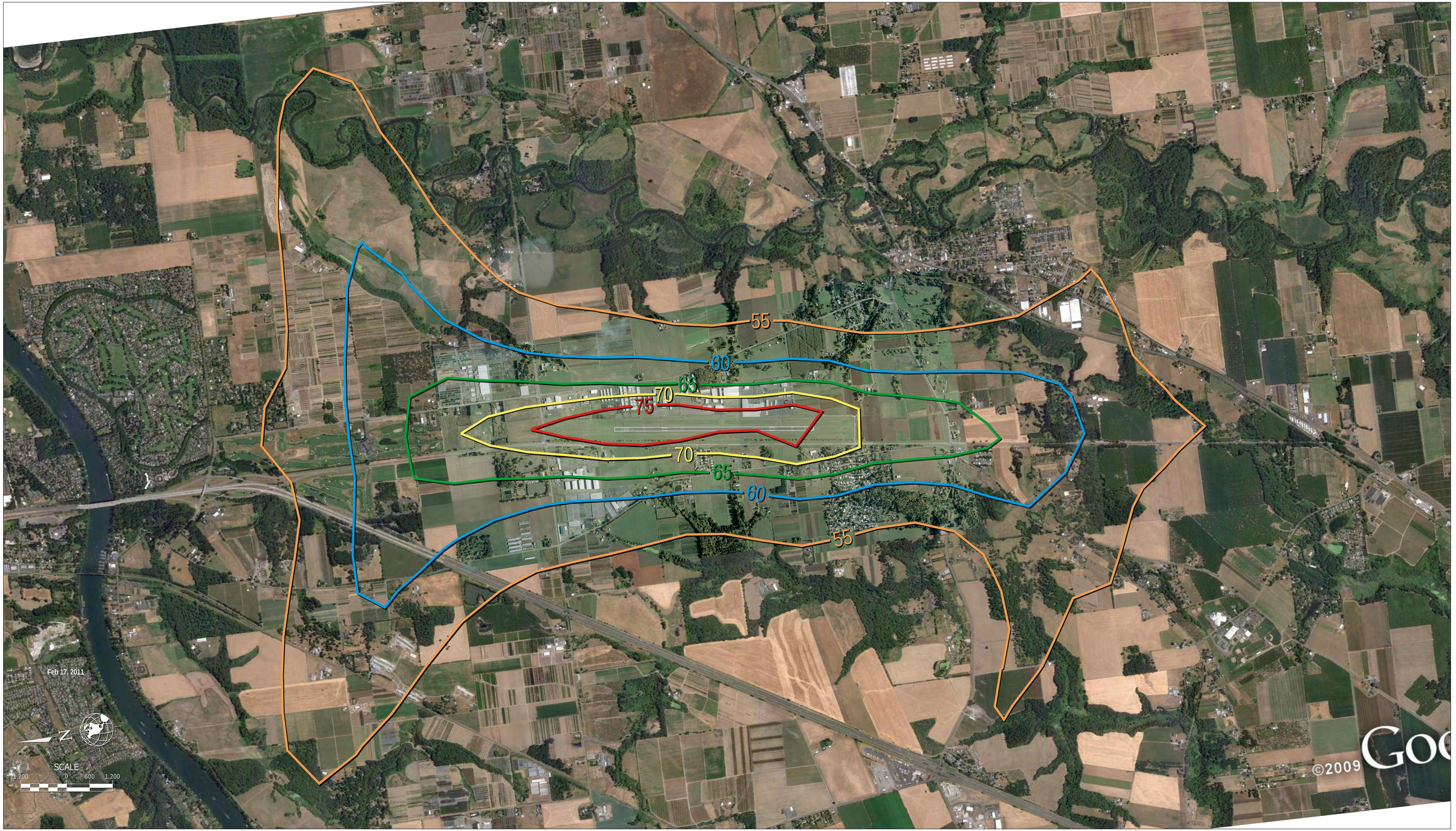
- 75
- 70
- 65
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- 55

Aurora State Airport

Aurora, OR

Exhibit 5E - Noise Contours
Existing Conditions 2010

034317-AIRP-NOISE_MC.DWG



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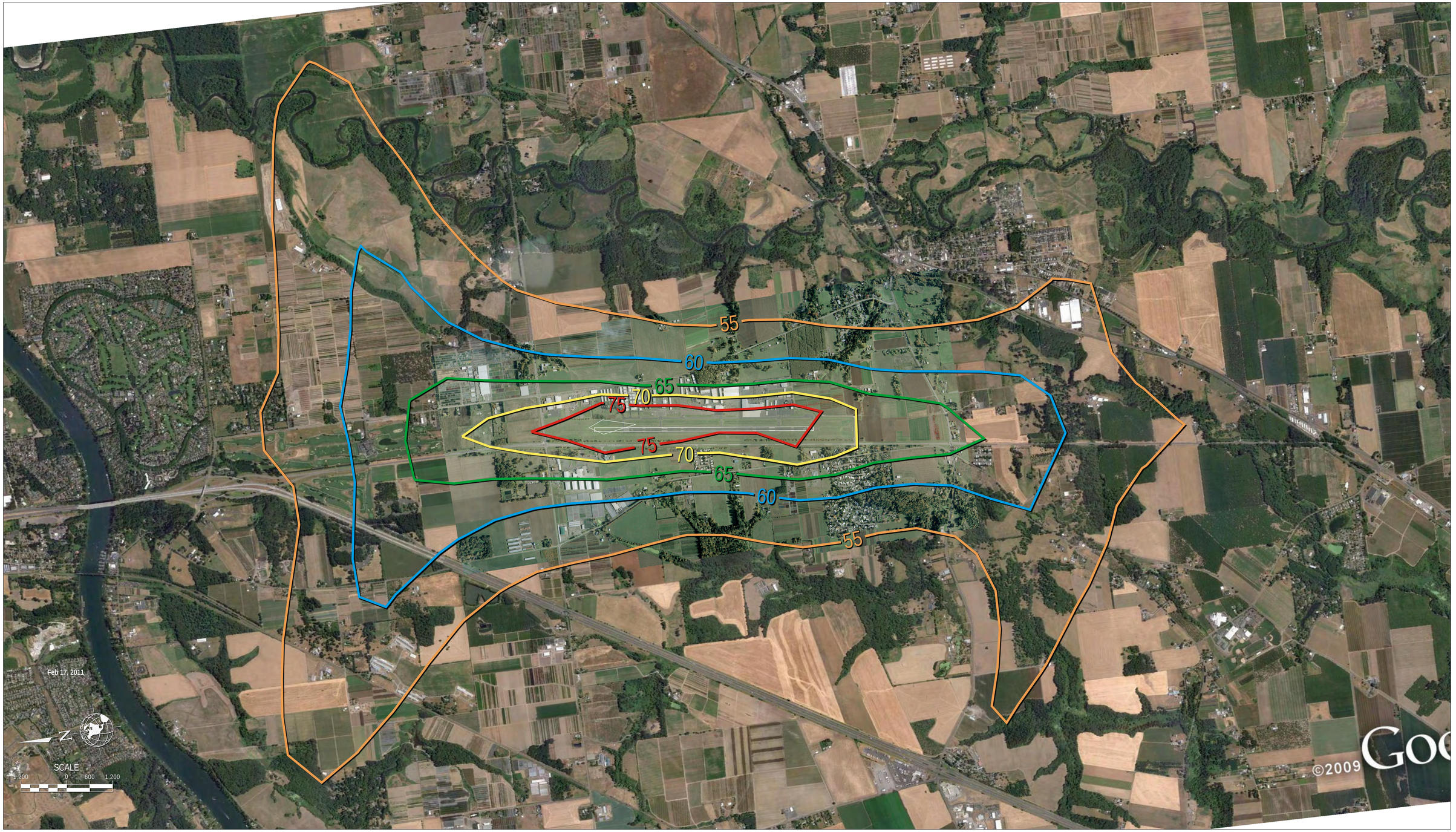
Aurora State Airport

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Exhibit 5F - Noise Contours

No Build Alternative 2020

034317-AIRP-NOISE_MC.DWG



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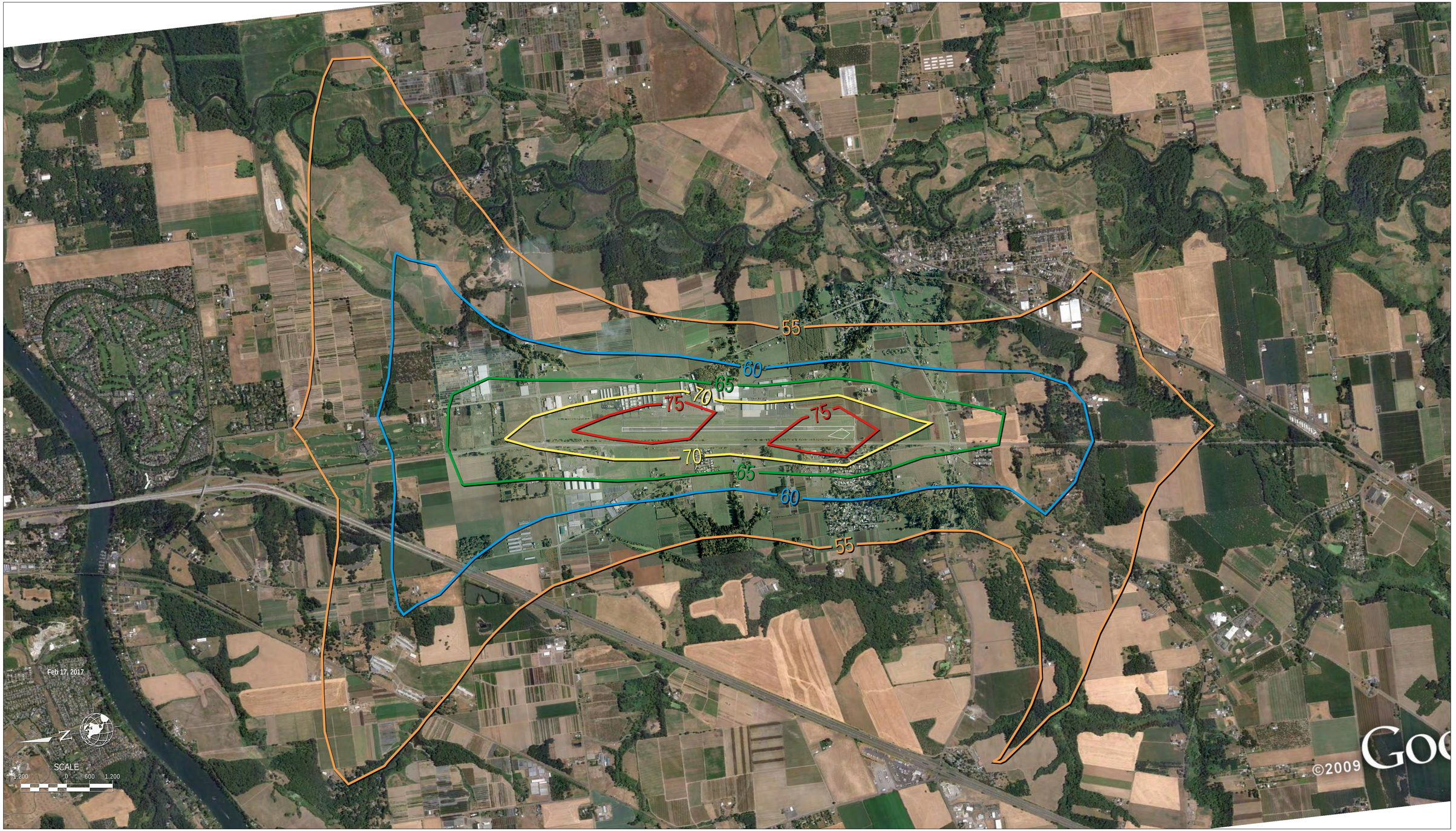
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Exhibit 5G - Noise Contours

Build Alternative 1 ~ 2020

600' Runway Extension North

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Exhibit 5H - Noise Contours

Build Alternative 2 ~ 2020

1,000' Runway Extension South

034317-AIRP-NOISE_MC.DWG

information presented in Chapter Three, *Aeronautical Activity Forecasts*. Flight paths input in the INM reflect the procedures shown in Exhibit 4A, as well as the departure procedures shown in **Exhibit 5I**[5].

2010 Existing Noise Contours

As presented in Exhibit 5E, the 65 dBA contour line extends off Airport Environs to the north, south and west. Some residential areas west of the Airport are included within this contour line, along with the 70 dBA line.

2020 No Build Alternative and Build Alternative 3 Noise Contours

The 2020 No Build Alternative and Build Alternative 3 contour exhibit represents the same physical layout as used in the 2010 existing noise contour exhibit. The only input variance is the increase in operations forecasted in Chapter Three. The increase in operations – and changes in aircraft fleet mix – cause the 65 dBA contour line to extend further off airport; however, the eastern 65 dBA noise contour line does remain nearly all within the Airport Environs. More residential homes would be impacted by noise exposures of 65 dBA, the FAA's threshold for compatibility.

2020 Build Alternative 1 Noise Contours

Exhibit 5G reflects the 600-foot runway extension to the north. Although the runway is extended to the north in this alternative, the noise profile is nearly identical to that in the 2020 No Build Alternative noise profile. The cause of this is the predominant use of Runway 35 during calm wind conditions (the Runway 17 threshold remains the same in Build Alternative 1).

2020 Build Alternative 2 Noise Contours

Build Alternative 2 proposes a 1,000-foot runway extension to the south, which is reflected in Exhibit 5H. As a result, the noise profile shifts to the south when compared to the previous profiles. Most notably, the 75 dBA contour line becomes two separate areas, because the aircraft noise exposure during the takeoff run is farther apart. Under this alternative, noise is shifted further away from Charbonneau, but closer to the City of Aurora and its surrounding communities. 65 dBA noise exposure west of the Airport is similar to the other 2020 contours. This alternative does incorporate more residential properties within the 65 dbA contour, due to its proximity to the City of Aurora.

Noise Analysis Summary

The noise profile is expected to increase by year 2020, regardless of development at the Airport. As shown in the noise contour exhibits, the 2020 noise profile for the No Build Alternative, Build Alternative 1, and Build Alternative 3 are nearly identical. In these noise profiles, some residential areas – mostly to the west – are within the 65 dBA noise contour. The noise profile associated with Build Alternative 2 displaces noise farther to the south of the Airport and reduces the noise impact to northern properties.

[5] *The FAA has not formally approved the departure procedures at this time; however, approval is expected in the fall of 2011.*

Table 5A. Sub-group Division by Aircraft Type and Departure Procedures (2010[6])

Aircraft Type	Percentage of sub-group[7]	Annual		Daily		Arrival		Departure		Touch and Go	
		Day	Night	Day	Night	Day	Night	Day	Night	Day	Night
Propeller-Driven Aircraft											
Single Engine											
Bonanza	30%	10,424	213	29	1	11	0	11	0	7	0
Cessna 172	45%	15,636	319	43	1	16	0	16	0	11	0
Cessna 206H	25%	8,686	177	24	0	9	0	9	0	6	0
Multi-engine											
Beech Baron 58P	100%	8,018	164	22	0	9	0	9	0	3	0
Turboprop											
Beech King Air 200	100%	8,909	182	24	0	12	0	12	0	1	0
Jet Aircraft											
Small Jet											
Cessna 500	5%	535	11	1	0	1	0	1	0	-	-
Lear 25	30%	3,207	65	9	0	4	0	4	0	-	-
Large Jet											
Cessna 550B	5%	535	11	1	0	1	0	1	0	-	-
Lear 35	30%	3,207	65	9	0	4	0	4	0	-	-
Astra 1125	30%	3,207	79	9	0	4	0	4	0	-	-
Helicopter											
Bell 206	55%	14,700	300	40	1	20	0	20	0	-	-
Bell 212	34%	9,087	185	25	1	12	0	12	0	-	-
Hughes 500	11%	2,940	60	8	0	4	0	4	0	-	-

[6] *Operations based on Chapter Three, Forecasts.*
[7] *Fleet based on Harris, Miller, Miller & Hanson report to ODA (2002, May 31).*



Feb 9, 2011

SCALE
1,200 0 600 1,200
SCALE: 1" = 1,200'

Legend

- Small Turbojet
- Large Turbojet
- Small Turboprop
- Large Turboprop
- Small Piston
- Large Piston

Note:
Departure Procedures are pending Federal Aviation Administration approval. Publication expected August, 2011.

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Exhibit 5I
Draft Departure Procedures

034317-AIRP-EX5E.DWG

Table 5B. Sub-group Division by Aircraft Type and Departure Procedures (2020[8])

Aircraft Type	Percentage of sub-group[9]	Annual		Daily		Arrival		Departure		Touch and Go	
		Day	Night	Day	Night	Day	Night	Day	Night	Day	Night
Propeller-Driven Aircraft											
Single Engine											
Bonanza	30%	10,942	223	30	1	11	0	11	0	7	0
Cessna 172	45%	16,413	335	45	1	17	0	17	0	11	0
Cessna 206H	25%	9,118	186	25	1	9	0	9	0	6	0
Multi-engine											
Beech Baron 58P	100%	7,295	149	20	0	9	0	9	0	3	0
Turboprop											
Beech King Air 200	100%	11,463	234	31	1	15	0	15	0	2	0
Jet Aircraft											
Small Jet											
Cessna 500	5%	782	16	2	0	1	0	1	0	-	-
Lear 25	30%	4,690	96	13	0	6	0	6	0	-	-
Large Jet											
Cessna 550B	5%	782	16	2	0	1	0	1	0	-	-
Lear 35	30%	4,690	96	13	0	6	0	6	0	-	-
Astra 1125	30%	4,690	96	13	0	6	0	6	0	-	-
Helicopter											
Bell 206	55%	18,341	374	50	1	25	1	25	1	-	-
Bell 212	34%	11,338	231	31	1	16	0	16	0	-	-
Hughes 500	11%	3,668	75	10	0	5	0	5	0	-	-

[8] *Operations based on Chapter Three, Forecasts.*
[9] *Fleet based on Harris, Miller, Miller & Hanson report to ODA (2002, May 31).*

ENVIRONMENTAL SCREENING OF ALTERNATIVES

Each alternative was analyzed to assess its relative environmental impact, as well as identify any environmental constraints that may prohibit development. The results of this analysis are presented in **Table 5C**.

Each alternative presents an array of environmental opportunities and constraints. The following discussion summarizes the potential environmental concerns associated with each alternative.

Table 5C. Environmental Constraints and Impacts[10]

Impact Categories[11]	No Build Alternative	Build Alternative 1	Build Alternative 2	Build Alternative 3
Air Quality	No apparent issues. *2*	No apparent issues. *2*	No apparent issues. *2*	No apparent issues. *2*
Biotic Resources	No apparent issues. *2*	No apparent issues. *2*	No apparent issues. *2*	No apparent issues. *2*
Land Use Impacts	No apparent issues. *1*	Perception of community character change. *2*	Perception of community character change. *3*	Perception of community character change. *4*
Construction Impacts	No apparent issues. *2*	No apparent issues. *2*	No apparent issues. *2*	No apparent issues. *2*
Section 4(f) Resources	No apparent issues. *2*	No apparent issues. *2*	No apparent issues. *2*	No apparent issues. *2*
Threatened and Endangered Species	No apparent issues. *2*	No apparent issues. *2*	No apparent issues. *2*	No apparent issues. *2*
Energy Supplies, Natural Resources and Sustainability	No apparent issues. *2*	No apparent issues. *2*	No apparent issues. *2*	No apparent issues. *2*
Environmental Justice	No apparent issues. *1*	Perception of runway extension impact on northwest residents. (Charbonneau has a concentration of elderly) *2*	Perception of runway extension impact on northwest residents. (Charbonneau has a concentration of elderly) *3*	No apparent issues. *1*
Farmlands	No apparent issues. *1*	No apparent issues. *1*	Loss of productive farmland in southern RPZ. *2*	Loss of productive farmland in both RPZs. *4*
Hazardous Materials	No apparent issues. *1*	Risk for spills is associated w/landside development. 2	Risk for spills is associated w/landside development. 2	Risk for spills is associated w/landside development. 2
Historical, Archaeological and Cultural Resources	No apparent issues. *2*	No apparent issues. *2*	No apparent issues. *2*	No apparent issues. *2*

[10] *The small italic number in each cell represents the qualitative rank of each alternative for the specific category. Where all alternatives are approximately equal, a value of 2 was given. A value of 1 represents the least impacting alternative; a value of 4 represents the greatest impact. A summing of these values appears at the bottom of this table, which in turn provides a subjective ranking of the four alternatives.*

[11] *The analysis is divided into 21 impact categories and is examined per FAA Order 1050.1E and guidance from the Council on Environmental Quality.*

Table 5B. Environmental Constraints and Impacts, *Continued*

Impact Categories	No Build Alternative	Alternative 1	Alternative 2	Alternative 3
Induced Socioeconomic Impacts	Potential loss of jobs and rent revenue. *3*	Development of landside improvements would create jobs and rent revenue. RW construction would create jobs. *2*	Development of landside improvements would create jobs and rent revenue. RW construction would create jobs. *1*	Development of off-airport landside improvements would create job, however businesses and revenue would be lost on-airport for BRL. *4*
Light Emissions and Visual Effects	No apparent issues. *2*	No apparent issues. *2*	No apparent issues. *2*	Increased approach lighting for precision approach. *3*
Energy Supply & Natural Resources	No apparent issues. *2*	No apparent issues. *2*	No apparent issues. *2*	No apparent issues. *2*
Noise	No apparent issues. *1*	Runway extension and aircraft types expand airport noise footprint. *3*	Runway extension and aircraft types expand airport noise footprint. *4*	Potential change in aircraft types expand airport noise footprint. *1*
Social Impacts	No apparent issues. *1*	Increased development could increase surface traffic demand. Perception of change in community structure. *2*	Increased development could increase surface traffic demand. Perception of change in community structure. *3*	Increased development could increase surface traffic demand. Perception of change in community structure, due to loss of homes and on-airport businesses. 4
Solid Waste	No apparent issues. *2*	No apparent issues. *2*	No apparent issues. *2*	Demolition for BRL compliance would create large amounts of debris. *3*
Water Quality	No apparent issues. *2*	No apparent issues. *2*	No apparent issues. *2*	No apparent issues. *2*
Wetlands	No apparent issues. *2*	No apparent issues. *2*	No apparent issues. *2*	No apparent issues. *2*
Cumulative Impact	No apparent issues. *2*	No apparent issues. *2*	No apparent issues. *2*	Community change due to loss of residential areas could be significant. *3*
Controversy	No apparent issues. *1*	Some issues. *2*	More issues. *3*	Many issues. *4*
Total ranking	36	42	47	53

No Build Alternative

The No Build Alternative does not propose any new use designations on the airport. It includes only maintenance for the next 20 years. The No Build Alternative does not present land use compatibility concerns, noise concerns, changes to the social environment, or direct threats to plant and animal communities in relation to FAA levels of significance. Notwithstanding, surrounding communities are concerned of the potential increased noise exposure at the Airport due to the increase in operations. In terms of overall impact, **this alternative has the least impact to the existing natural and built environments.**

Build Alternative 1

This alternative includes development plans (primarily hangars and aprons) for approximately nine acres of State-owned land along Airport Road, and an ATCT. Airside improvements include a 600-foot extension of the runway and taxiway on the north end, and RPZs consistent with an airport designated for ARC B-II with approaches not lower than 1 sm visibility.

The RPZ dimensions would be 500 feet at the runway end, 700 feet at the outer end, and 1,000 feet in length. The southern end would include Keil Road and a strip of land outside of the existing airport property. FAA typically discourages roads in RPZs, but FAA advisory circulars do not prohibit them. An easement, rather than acquisition, is proposed for the small area south of Keil Road. Additionally, an easement would be proposed for the small portion of the northern RPZ extending off State-owned property. This would, however, not be a change to the current condition at the Airport.

Development of the vacant land in State ownership, along with the runway/taxiway extension, would increase impervious surface. The airport underwent a revision to on-airport drainage as part of the runway relocation project in 2005. The current system, with minor modifications, should be able to accommodate increased stormwater from new impervious surface.

The increase in hangar development, as well as new on-airport commercial and employment uses may also be perceived as a change in character by local residents. Development of the landside areas may also increase surface transportation demand, contributing to peak period congestion, or the appearance thereof for area residents.

The extension area appears to have been previously disturbed and likely does not constitute prime habitat.

Even with the northern runway extension, the noise contour of the Airport does not extend farther to the north, because the predominant runway use is Runway 35 (the preferential calm wind runway). In this alternative, the Runway 17 threshold does not change.

Additional development proposed in the airport environs, including privately held land in the Southend Airpark and land owned by HTS, is outside of the control of ODA. The size and complexity of these development projects would likely be identical under Alternatives 1 and 2, but may be denser with the No Build Alternative, due to the lack of development on State-owned land. Since Alternative 3 changes

the building restriction line, there may also be more development on privately owned land. These developments would likely contribute to the cumulative impact of airport-area development in terms of impervious surface/stormwater, community character, noise and traffic.

This alternative has the least amount of environmental impact of the three build alternatives.

Build Alternative 2

This alternative is similar to Build Alternative 1 in the allocation of future airside uses. This alternative would include a runway and taxiway extension of 1,000 feet to the south. The RPZs would be consistent with an airport designated ARC C-II with visual approaches greater than ¾ sm visibility.

The RPZ dimensions would be 1,000 feet at the runway end, 1,510 feet at the outer end, and 1,700 feet in length. The southern end would include Keil Road and Highway 551, as well as residential and farm properties on the west, south and east areas of the RPZ. FAA typically discourages roads in RPZs, but FAA advisory circulars do not prohibit them. Avigation easements would be sought from the residential property owners, and the areas within the RPZ currently in agricultural uses would be acquired.

Development of the vacant land in State ownership would be similar to Build Alternative 1. Because this alternative has the longest runway extension, the impervious surface increase would be larger than in Alternative 1. The existing stormwater collection system, with minor modifications, should be able to accommodate increased stormwater from new impervious surface.

The increase in hangar development, as well as new on-airport commercial and employment uses may also be perceived as a change in character by local residents. Development of the landside areas may also increase surface transportation demand, contributing to peak period congestion, or the appearance thereof for area residents.

This alternative would accommodate a greater variety of aircraft, due to the increased runway length. As stated above, the noise profile would extend farther south, but improve noise conditions to the north of the Airport. This alternative has the greatest impact in relation to noise of any of the alternatives.

Additional development proposed in the airport environs, including privately held land in the Southend Airpark and land owned by HTS, is outside of the control of ODA. The size and complexity of these development projects would likely be identical under Alternatives 1 and 2, but may be denser with the No Build Alternative, due to the lack of development on State-owned land. Since Alternative 3 changes the building restriction line, there may also be more development on privately owned land. These developments would likely contribute to the cumulative impact of airport-area development in terms of impervious surface/stormwater, community character, noise and traffic.

This alternative is has the mid-level environmental impact of the build alternatives.

Build Alternative 3

Due to the increased building restriction line, there is less development potential than in Build Alternatives 1 and 2. There is no runway extension proposed in this alternative. The RPZs would be

consistent with an airport designated for aircraft design group C-II with visual approaches lower than ¾ sm visibility.

The RPZ dimensions would be 1,000 feet at the runway end, 1,750 feet at the outer end, and 2,500 feet in length. The 35-foot building restriction line would extend 745 feet perpendicular from the runway centerline. The northern RPZ would include Arndt Road and the electric transmission lines just north of the road. The southern end would include Keil Road and Highway 551, as well as residential and farm properties on the west, south and east areas of the RPZ. A variance from FAA would be sought for the roads within the RPZ. The power lines would need to be relocated. Avigation easements would be sought from the residential property owners who are outside of the building restriction line, and the areas within the RPZ currently in agricultural uses would be acquired. Structures within the building restriction line, regardless of whether they are on- or off-airport would be acquired and removed. Acquisition and relocation would follow the federal guidelines. Depending on the type of commodity produced, the FAA may allow continuation of agricultural practices within the RPZ.

Development of the vacant land in State ownership would be similar to Build Alternatives 1 and 2; however, it may be more dense due to restrictions from the building restriction line. Because this alternative has no runway extension, the impervious surface increase would be less than in Alternatives 1 and 2. The existing stormwater collection system, with minor modifications, should be able to accommodate increased stormwater from new impervious surface.

The increase in hangar development, as well as new on-airport commercial and employment uses may also be perceived as a change in character by local residents. Development of the landside areas may also increase surface transportation demand, contributing to peak period congestion, or the appearance thereof for area residents. It is likely that the loss of trips associated with properties removed to comply with the building restriction line requirements would offset any trips related to new development, for a likely net loss in area wide travel demand.

Land to the south of the airport is currently zoned Exclusive Farm Use (EFU) under Marion County's Zoning Code. The land is considered High Value Farmland, and has been described as Foundation in a categorization of viable farmland that is worth protection, but it is not a legal classification, as EFU is. Airport development on EFU land is restricted, and it is difficult to rezone EFU land to other classifications, such as Public. Changing zoning would require an exception to Oregon Planning Goal 3. If FAA funding is used, the project would also require review under the federal Farmland Protection Policy Act (FPPA). Both processes are rigorous and the justification for the proposed change may not meet the tests to allow the change.

This alternative maintains the same runway dimensions as the No Build Alternative. While the noise profile does not vary from the contours shown for the No Build Alternative, there may be a perception of a noise increase due to the use of aircraft during instrument conditions, since Build Alternative 3 improves the Airport's instrumentation capabilities.

Additional development proposed in the airport environs, including privately held land in the Southend Airpark and land proposed for development by HTS, is outside of the area governed by the Airport

Master Plan. The size and complexity of these development projects would be identical under all of the Build Alternatives, as well as the No Build Alternative. These developments would likely contribute to the cumulative impact of airport-area development in terms of impervious surface/stormwater, noise and traffic.

This alternative is has the greatest environmental impact of the Build Alternatives.

As shown in Table 5C, the No Build Alternative has the least impact, as it does not change the airport from its current configuration. Alternative 3 has the greatest impact of the build alternatives because of its on-airport actions and off-airport impacts to residences, businesses, and agriculture.

Alternative 1 is shown with the least amount of impact for the build alternatives, while Alternative 2 is shown as having the mid-level impact. While Alternative 3 lacks a runway extension, the need for a relocation of the taxiway and expansion of the building restriction line causes a large amount of off-airport property impact, including social and socioeconomic impacts. In addition, the restrictions on airport use of EFU land may make a zone change unfeasible. Additional research needs to be conducted on this issue.

EVALUTION OF ALTERNATIVES

Chapter 1 identified Goals and Issues for this Master Plan Update. The intent of identifying these early in the planning process was, in part, to help evaluate the alternatives once they were developed.

The following discussion is intended to be used as a means of comparison, and also a guideline for dialogue among interested parties, to aid in decision-making while developing the Preferred Alternative for the Airport.

Master Plan Goals

Enhance Safety.

All alternatives meet FAA design standards, which are developed to ensure the safety of people operating aircraft and of people on the ground.

The lack of an ATCT has been cited as a safety concern. All build alternatives show the construction of an ATCT and funding has been secured by ODA.

Discussions with ODOT, by ODA personnel, have identified the intersection of Keil Road and Highway 551 to be a safety hazard. Build Alternatives 2 and 3 would dead-end Keil Road, which would remove the intersection. Alternative 2 also includes a new service road that is intended to help separate vehicular traffic from taxiing aircraft. The goal of enhancing safety goes beyond airport safety to include vehicular and pedestrian safety. As such, Build Alternative 2 enhances safety in ways the other alternatives do not.

As the Airport Access analysis in Chapter Four reported, It is recommended that ODA continue to work with and support Marion County and the City of Aurora as improvements to Airport Road are considered. It will be important that appropriate considerations be given to the entrances (gates) to the Airport and business along Airport Road.

Meet the current and projected needs of airport users, as feasible (feasibility includes financial, environmental, and political).

As far as meeting the needs of airport users, Alternative 2 is best at providing the runway length supported by airport users. Alternative 1 also lengthens the runway, but less than Alternative 2. Alternative 3 provides precision instrument approach capability that would reduce the time the airport is below minima. Alternative 2 provides some improvement of instrument approach capability, but not as much as Alternative 3. Alternatives 1 and 2 are the best at accommodating the landside development needs projected for the next 20 years.

Alternative 3 has the greatest capital cost, followed by Alternative 2, Alternative 1, and the No Build Alternative. In terms of revenue generation, Alternatives 1 and 2 are the highest, with runway extensions that allow more fuel sales and more landside development for hangar rental and aviation businesses.

As stated in the environmental section, changing land zoned as EFU to Public may be unfeasible; an exception to Oregon Planning Goal 3 would be required.

On the grounds of political feasibility, it has been expressed through the planning process that there is concern over expanding the Airport's footprint. Build Alternative 1 does not appreciably expand the footprint, so it may have the least political controversy of the build alternatives, although Alternative 1 strengthens and lengthens the runway. Both Alternatives 2 and 3 expand off-Airport. Alternative 3 would require a zoning change and two rigorous farmland protection reviews; all of which are likely to be controversial. In addition, Alternative 3 has impacts to residential properties, unlike Alternative 2, so it likely has the greatest cause for political controversy.

Consider all the off-airport impacts of Airport development; minimize negative impacts and maximize positive impacts.

This goal ranges from including surrounding communities in the planning process, to protecting farmland and livability, to maximizing economic benefit. The assessment of how well the alternatives meet this goal will be addressed after the PAC has met to evaluate the impacts of the alternatives.

Master Plan Issues

Runway Extension

Through the planning process, many users have expressed the need for an extended runway while concerned citizens have voiced an extension would disrupt their community's livability. Two of the build alternatives show runway extensions. Noise modeling was prepared for each of the alternatives, to help evaluate the impact of the runway extensions, as discussed previously.

Air Traffic Control Tower

In light of safety concerns, ODA has secured funding for an ATCT at the Airport. Three potential locations for the ATCT are shown on the build alternatives. These locations will be assessed by FAA in the spring of 2011 to determine their suitability in regards to FAA's siting criteria.

Impact of Airport Expansion on Surrounding Area

Concern has been voiced over the Airport's impact on Boone Bridge. After analysis, the Airport's impact to Boone Bridge equates to 1,800 AADT out of the 115,700 AADT as indicated by the ODOT. Even with growth projections, there would still be an insignificant impact from Airport-related activity.

Other concerns listed related to the Aurora Rural Fire District's ability to respond at the Airport, availability of utilities, and aircraft noise. All of the build alternatives show locations for the Fire District's response building. Utilities are an issue the Airport is facing, regardless of future development. New technologies may bring more efficient means of septic treatments to the Airport, or a sewer extension from the City of Aurora may need to occur in the future. Aircraft noise was addressed for all of the alternatives, to assess each alternative's impact to the surrounding communities; the results of this study are shown above.

Calm Wind Runway Change

ODA is working with the FAA to get approvals for new departure procedures that will lessen the Airport's disruption to surrounding communities. The calm wind runway, as recommended in the 2002 noise study, will remain with all alternatives. As shown in the noise contour exhibits, the Airport's noise profile will increase by 2020. Utilization of the Runway 35 calm wind runway reduces impacts to areas north of the Airport. However, in Build Alternative 2 the noise exposure shifts closer to the City of Aurora, as a result of the calm wind runway.

Precision Instrument Approach

Build Alternative 3 shows what would be required to implement a precision instrument approach. The process would be difficult financially and politically. The best minima possible would likely be ½ sm, which is the lowest achievable with a GPS-aided LPV approach or with a Category I instrument landing system. Given historical weather conditions at the Airport, visibility is below ½ mile 2.3% of the time, below ¾ sm 3.7% of the time, and below 1 sm 5.0% of the time.[12]. The worst month is November, when visibility is below ½ sm 6.8% of the time, below ¾ sm 10.2% of the time, and below 1 sm 13.6% of the time. In constrast, visibility exceeds 1 sm 98.8% of the time in July. The cost associated with Alternative 3 may outweigh the benefit gained from implementing a precision instrument approach.

Helicopter Operations

All three build alternatives show suggested locations for the helicopter operations area on state-owned property.

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[12] *National Oceanic and Atmospheric Administration (NOAA) weather data for 2000-2009.*

Other Airport Improvements

The other airport improvements listed were a run-up area for Runway 17, improved runway lighting, a restaurant, and radar/approach control coverage in the area. Build Alternative 1 shows a run-up area on the extended Runway 17 parallel taxiway. Build Alternative 2 also shows a run-up area that could be constructed if Runway 17 is not extended. Approach lighting would be upgraded, as needed, to implement new instrument approaches. A restaurant is not shown on State-owned property, but could be developed on private property. Radar is difficult to obtain, as the airway system is becoming more GPS-based. However, the ATCT will provide approach control at the Airport when the tower is open.

PREFERRED ALTERNATIVE

On March 10, 2011, the above alternatives were presented to the Planning Advisory Committee (PAC) and public. The purpose of the meeting was to gather input towards developing a preferred alternative. In addition to discussion during the meeting, comment forms were available at the meeting and on the project website, and comments were gathered for two weeks after the meeting. Comments varied greatly, from supporting the No Build Alternative to Airport expansion. **Appendix K** documents the discussions and testimony given, as well as the comments received.

Since no consensus for a Preferred Alternative was reached at the PAC meeting, ODA considered PAC and public comments (gathered through March 24), and then presented a recommended Preferred Alternative for the Oregon Aviation Board's consideration on March 31. The Preferred Alternative was then available for public comment until April 21. Based on the comments received during that period, the project team presented potential add-on Scenarios 1 and 2 to the Board on April 28. Scenarios 1 and 2 integrate the use of displaced thresholds to gain additional usable runway, as further detailed below. Subsequent discussions between ODA and FAA have reintroduced the concept of a 1,000-feet runway extension to the south, hereinafter referred to as Scenario 3. The following text outlines the Preferred Alternative and the three add-on scenarios, to be further discussed with the PAC and public on June 7.

The Preferred Alternative, shown in **Exhibit 5J,** reflects ODA's plan for developing the Airport. The Preferred Alternative will be the basis for revising the Airport Layout Plan, which establishes FAA grant funding eligibility for airport improvements and must be approved by the FAA. Implementing the airfield improvements in the Preferred Alternative will depend on FAA and ODA funding availability and the results of environmental analyses for individual projects. The private development of landside facilities will depend on the actual growth of aviation demand, market and financing conditions, and local laws and regulations.

The predominant features of the Preferred Alternative are described below. Scenarios 1, 2, and 3 vary from the Preferred Alternative only in the area of Runway Length – all other components will remain constant.

Airport Reference Code

As Chapter Three, *Aeronautical Activity Forecasts*, documented, activity at the Airport currently meets the criteria for an ARC of C-II. Meeting the FAA design standards for the appropriate ARC at an airport is important for safety. The Airport currently is designed to ARC B-II standards, although the existing runway width and the runway-to-parallel taxiway separation exceed B-II standards and meet the standards for ARC C-II. The larger RSA required for ARC C-II can be provided easily, since the ground within the larger RSA is already well-graded for rescue vehicles and aircraft recovery in case of an aircraft undershoot, overshoot, or excursion from the runway. The major design standards that would need upgrading would be the RPZ and ROFA.

For the current instrument approach visibility minimums, the required RPZ is 700 feet longer for ARC C-II. ODA should control land within the RPZs to prevent incompatible land uses. Residences and places of assembly are examples of incompatible land uses within an RPZ. If fee acquisition is not possible, land use control may be provided through avigation easement. ODA has not initiated consultation with the affected property owners relating to this item.

Vehicles on Highway 551 west of the Airport would be objects within the wider ROFA required for ARC C-II. The highway would only encroach upon this surface by a small margin, and a modification to FAA standards will be requested. Recent discussions with the FAA indicate the request will likely be approved.

Runway Length

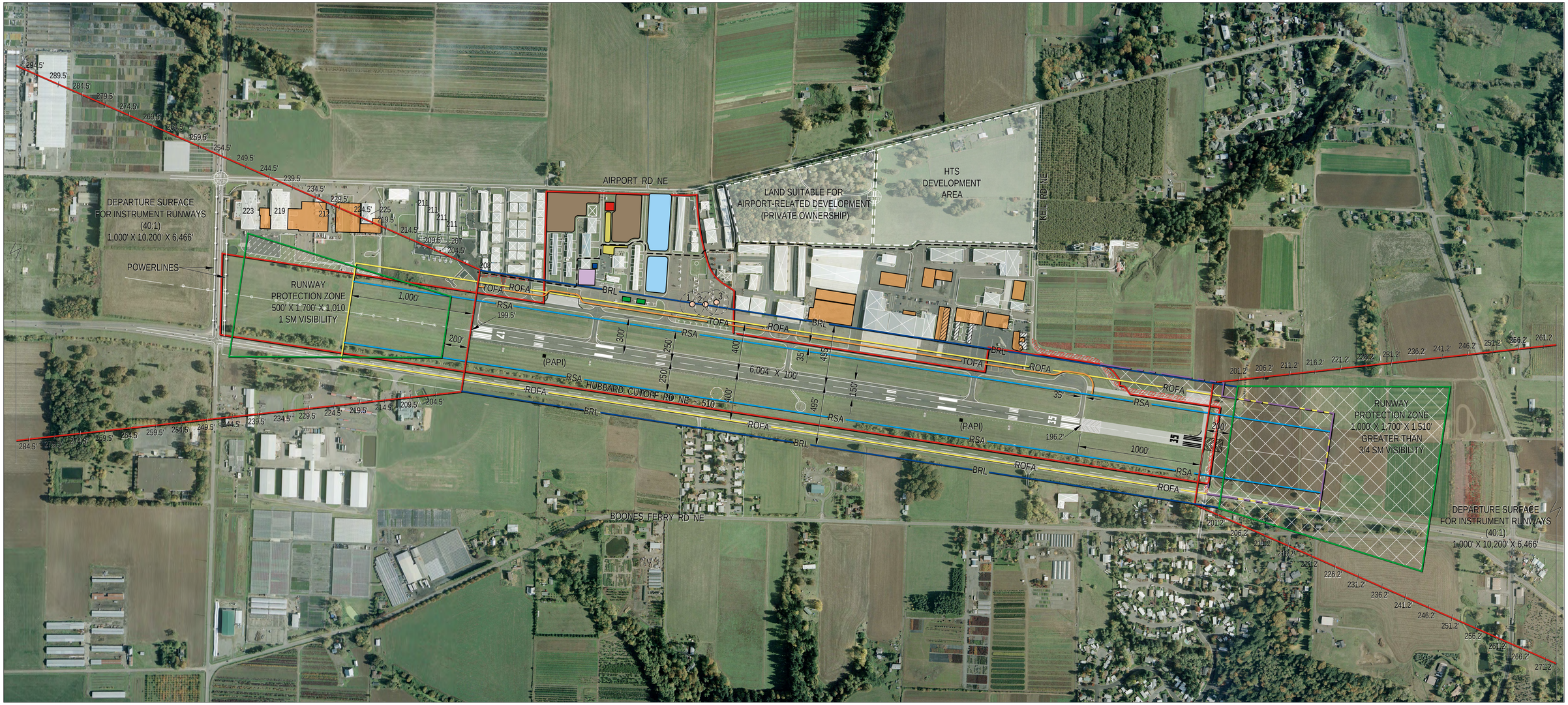
Preferred Alternative

Although this Master Plan has shown that a runway extension is justified according to FAA guidance, ODA has decided that any extension would prove infeasible at this time. An extension to the north might constrain Columbia Helicopters' ability to expand on their private property. An extension to the south might have a negative impact on farmland – a potentially environmentally infeasible situation. A south extension might also have a negative impact on private property and Keil Road. Keil Road provides necessary access for farm equipment/machinery and emergency responders, even though it poses some safety concerns at the intersection with Highway 551.

Add-On Scenario 1

Scenarios 1 and 2 incorporate the use of displaced thresholds, which create "declared distances." The purpose of declared distances in airport design is to provide an equivalent RSA, ROFA, or RPZ in accordance with the design standards at existing constrained airports where it is otherwise impracticable to meet standards by other means. Declared distances are also employed when there are obstructions in the runway approaches and/or departure surface that are beyond the ability of the airport owner to remove and result in a displaced runway threshold or change in the departure end of the runway. In other words declared distances, when applied at Aurora State, can increase the usable runway length without fully extending the runway or encroaching upon adjacent lands

Scenario 1 adds a 600-feet displaced threshold to Runway 35 and 200-feet displaced threshold to Runway 17 to acquire the following declared distances, see **Exhibit 5J Scenario #1**.



June 7, 2011

SCALE
400 0 200 400
(FEET)
1 INCH = 400 FT.

Legend

- Property Line
- Future Property Line
- BRL — 35' Building Restriction Line
- RSA — Runway Safety Area
- ROFA — Runway Object Free Area
- TOFA — Taxiway Object Free Area
- Service Road
- Existing Buildings
- Future Buildings
- Future Paved
- Air Traffic Control Tower (ATCT)
- Aurora Rural Fire Protection District
- Future Apron Area
- Cargo Apron
- Vehicular Parking
- Hangar Development
- Fuel Station
- Helicopter Parking
- Precision Approach Path Indicator (PAPI)
- Existing Building Removal
- Existing Building Hts
- Septic Drain Field
- (White) Future Property Aquisition
- (White) Future Avigation Easement

General Notes

Airport Reference Code (ARC) - C-II
Runway strengthened to 60,000 lbs dual wheel gear

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Aurora State Airport
Aurora, OR

Exhibit 5J
Preferred Alternative
Revised 06/27/11

034317-AIRP-EXSJ_MC.DWG



May 11, 2011

SCALE
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(FEET)
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General Notes

Airport Reference Code (ARC) - C-II
Runway strengthened to 60,000 lbs dual wheel gear
Tower location per FAA / ODA meeting in April

Scenario #1

Add 600-feet displaced threshold to Runway 35 and 200-feet displaced threshold to Runway 17 to acquire the following declared distances:

Scenario #1 Declared Distances		
	R35	R17
Takeoff Run Available (TORA)	5,604'	5,204'
Takeoff Distance Available (TODA)	5,604'	5,204'
Accelerate-Stop Distance Available (ASDA)	5,804'	5,804'
Landing Distance Available (LDA)	5,004'	5,004'

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Aurora, OR

Exhibit 5J
Preferred Alternative
Scenario #1

03437-AIRP-EXSJ_SCENARIOS_MC.DWG



May 11, 2011

SCALE
400 0 200 400
(FEET)
1 INCH = 400 FT.

Legend

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- (White) Future Avigation Easement

General Notes

Airport Reference Code (ARC) - C-II
Runway strengthened to 60,000 lbs dual wheel gear
Tower location per FAA / ODA meeting in April

Scenario #2

Add 800-feet displaced threshold to Runway 17 to achieve the following declared distances:

Scenario #2 Declared Distances

	R35	R17
Takeoff Run Available (TORA)	5,004'	5,804'
Takeoff Distance Available (TODA)	5,004'	5,804'
Accelerate-Stop Distance Available (ASDA)	5,804'	5,804'
Landing Distance Available (LDA)	5,004'	5,004'

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Exhibit 5J
Preferred Alternative
Scenario #2

Scenario 1 Declared Distances		
	Runway 35	Runway 17
Takeoff Run Available (TORA)	5,604’	5,204’
Takeoff Distance Available (TODA)	5,604’	5,204’
Accelerate-Stop Distance Available (ASDA)	5,804’	5,804’
Landing Distance Available (LDA)	5,004’	5,004’

Add-On Scenario 2

In Scenario 2, an 800-feet displaced threshold would be added to Runway 17 (**Exhibit 5J Scenario #2**). All development would be on State property for the runway. If a parallel taxiway is constructed, property acquisition from Willamette Aviation would be required. Traffic departing to the south (Runway 17) would be against the calm wind traffic on Runway 35.

Scenario 2 Declared Distances		
	R35	R17
Takeoff Run Available (TORA)	5,004’	5,804’
Takeoff Distance Available (TODA)	5,004’	5,804’
Accelerate-Stop Distance Available (ASDA)	5,004’	5,804’
Landing Distance Available (LDA)	5,004’	5,004’

Add-On Scenario 3

The FAA has been approached regarding the use of displaced thresholds at Aurora State. At this time, an official response has yet to be received. However, preliminary discussions with the FAA have indicated they are not in favor of using displaced thresholds since doing so would only be a partial utilization of the runway (*i.e.*, not all pavement would be available for takeoff and landing). Additionally, a runway extension was justified in previous sections of the Master Plan, so the FAA would favor pursuing a runway extension to meet the demand. In response, Scenario 3 was developed to incorporate a 1,000-feet extension to the south (**Exhibit 5J Preferred Alternative**). The runway extension would accommodate nearly all business jets with ARC C-II and below that could potentially operate at the Airport. Keil Road would be dead-ended, with no access to Highway 551.

Runway/Pavement Strength

The analysis relating to pavement strength in Chapter Four tied runway strength to runway length. Although the runway length will remain the same in the Preferred Alternative, strengthening of the runway's pavement is proposed. The parallel taxiway currently has 60,000 pounds dual wheel gear strength and it is recommended the runway be overlaid to provide the same pavement strength as the taxiway. Currently there are airplanes based at the Airport with maximum takeoff weights that exceed the runway's strength rating.

Instrument Approach Procedures

The need for better instrument approach capability was identified by several Airport users at the beginning of this planning process, and the business aviation industry recommends better approach capability than the Airport has. When visibility is reduced by fog, rain, or snow to a distance below the minima set for an airport's instrument approaches, airplanes cannot land, resulting in costly trip delay or re-routing.

The Preferred Alternative proposes no changes to the Runway 17 approach minima, 1 statute mile. For Runway 35 (the calm wind runway), the Preferred Alternative improves the instrument approach to visibility minima greater than ¾ statute mile. The improved approach procedure would use GPS and not require additional navigational aids on the Airport, except for an approach lighting system similar to the system at the north end of the runway. Based on ten years of historical weather data, the improved instrumentation will increase annual Airport usability by 1.3% (nearly five days). In November, the increased use of the Airport will be 3.4% of the time.

In addition to reducing the time the Airport is "closed" due to weather, the instrument approach improvement will enhance aviation safety by increasing regional capability for instrument landings, increasing the margin of safety for VFR traffic, and making it easier for Airport users to adapt to sudden weather changes.

As mentioned previously, the change in ARC to C-II lengthens the RPZ at the north end of the runway, even though there is no change to Runway 17's minima. Most of the RPZ extension will remain on Airport property and where it extends off-airport avigation easements will be sought. With the instrument approach improvement to Runway 35, the RPZ at the south end of the runway becomes much larger, extending beyond current Airport property. ODA will pursue control of the additional land in the Runway 35 RPZ through fee acquisition.

Air Traffic Control Tower

The ATCT location was further analyzed through the FAA's tower siting study on March 3-5. The final location will be west of the Columbia Aviation Association Clubhouse, in the vicinity of the State's existing aircraft parking apron, as shown on the alternative exhibits.

Cargo Apron

The Oregon Aviation Plan (2007) identified the need for a cargo apron at the Airport. This apron would be used for aircraft parking while unloading/loading freight onto ground vehicles; it would not include a

sorting facility. The Preferred Alternative places the cargo apron north of Aurora Aviation because of good accessibility to the Airport's current access road.

North Run-up Area

There is no run-up area to Runway 17, which poses a safety hazard. Current restrictions do not allow construction of a run-up area near the Runway 17 end. As a compromise, a run-up area is proposed approximately 500 feet south of the north end of the parallel taxiway. In order for the run-up area to be constructed, the Aurora Aviation fuel tanks must be relocated.

Relocation of Fuel Tanks

As stated in prior chapters, the Aurora Aviation fuel tanks are located in an undesirable area due to their close proximity to Airport taxiways. Additionally, the north run-up area is proposed where the fuel tanks are located. ODA will negotiate relocating these fuel tanks northeast of the Aurora Aviation FBO building.

Aurora Rural Fire Protection District

While an Airport Rescue and Fire Fighting (ARFF) facility is not required for the Airport, the Aurora Rural Fire Protection District has indicated interest in locating a facility on the Airport where they could house their firefighting apparatus. The most desirable location, based on the District's input, is adjacent to the existing fire suppression system centrally located on the Airport near Airport Road.

Helicopter Parking

The helicopter parking area on state-owned property is proposed in an area currently used for fixed-wing tiedowns, approximately 500 feet south of the proposed run-up area. This area separates helicopter and fixed-wing aircraft parking to minimize possible damage to small fixed-wing aircraft by rotor wash.

Internal Service Road

An internal service road is included to help separate vehicular traffic from taxiing aircraft, which will enhance safety. It is intended to be used exclusively by approved operators (ODA and others who must use it for specific purposes, like fuel trucks, etc.).

Precision Approach Path Indicators (PAPIs)

PAPIs should be installed to replace the less precise visual glide slope indicators at the Airport.

Demand-Based Improvements

The Preferred Alternative shows additional hangar and tiedown areas on state-owned property. It is expected that not all of the demand-based needs will be met by development on state-owned land, and development/reconfiguration of private property will likely occur. Accordingly, the adjacent 16-acre church camp property is identified as suitable for airport-related development. Within the 20-year planning period, the projected need for additional land that is not currently zoned Public is only 5 acres. However, demand may exceed the forecast or development density may be lower than projected. The

church camp property east of the Airport is a logical area for excess demand to be met because it is adjacent to the Airport and on the Airport side of Airport Road.

Although previous discussions identified the adjacent church camp property as a potential location to meet this forecasted need, through the public involvement process, it was determined that it would not be identified on the Airport Layout Plan as future airport-related development.

Appendix to Chapter Five: ADDITIONAL RUNWAY LENGTH SCENARIOS

Airport Master Plan Update

Aurora State Airport

January 11, 2011

The Final Draft Airport Layout Plan (ALP) Drawing Set was submitted to the FAA's Seattle Airports District Office for review and comment in November 2011. The Final Draft ALP reflected two runway length scenarios. One scenario was an 800-foot displaced threshold to Runway 17, with modification to standards request to allow the existing Runway 17 threshold to be used in calculating FAA design surfaces. The other scenario was a 1,000-foot extension to Runway 35. The Oregon Aviation Board's preference was to pursue the displaced threshold, with the full extension as a back-up plan if the FAA would not approve the modifications to standards.

In response to this submittal, the FAA directed ODA to revisit the alternative of a northern extension to Runway 17 and stated they would not support a displaced threshold (FAA letter dated November 18, 2011 is included as reference). The FAA's position is that the benefit from a limited use displaced threshold to Runway 17 is not commensurate with the cost – particularly they did not agree that minimizing impacts to private property justified the use of the displaced threshold. Rather, an actual extension to Runway 17 on property already owned by the State is more preferable to the FAA. Furthermore, the option to extend Runway 35 south would not be supported by the FAA since adequate land to the north remains to accommodate a runway extension in that direction.

This appendix to the alternatives chapter is intended to explore the scenarios suggested by the FAA, and to examine additional issues caused by extending the runway northward beyond those posed to private property. It will identify the issues associated with extending the runway north versus south to assist the ODA, Oregon Aviation Board and FAA in determining the appropriate action to reduce constrained operations at the Aurora State Airport.

Northern Extension Option

The FAA's letter cites that a 1,000-foot runway safety area (RSA) can be achieved north of Runway 17 on land owned by the state, in which case an 800-foot extension could be feasible. However, potential obstructions posed by Arndt Road, two power lines, and other facilities that would be infeasible to relocate, render a northern extension limited to 400 feet. Referencing data from Chapter Four Table 4E (also included as reference), there are no operational impacts with a 400-foot extension. To begin reducing known constrained operations at the Airport, a minimum extension of approximately 500 feet would be required. Information presented in Chapter Four shows that a runway extension of approximately 1,000 feet would have a significant impact on reducing constrained operations at the Airport. Further discussions with the FAA regarding this limitation have clarified the need to extend Runway 17/35 beyond what is possible for Runway 17. Therefore, since a 1,000-foot extension north would not be achievable due to facilities penetrating various design surfaces, this option includes a 600-foot extension to the south to gain the more ideal runway length (see **Exhibit 5K**).

Key Features

The following discussion outlines key features of the northern extension option for comparison with the other alternative.

Runway Length

The ultimate runway length would be 6,004' – to be achieved by a north extension to Runway 17 of 400 feet and a south extension to Runway 35 of 600 feet.

An extension to Runway 17 assumes that Arndt Road would not be relocated and the power lines adjacent to Arndt Road would not be relocated or buried; both would remain located in the runway protection zone (RPZ). Arndt Road is a major arterial that was recently reconstructed and widened and would be very costly relocate and any relocation would have a large impact to surface transportation. Similarly, the high voltage power lines would be very costly to relocate. **FAA Advisory Circular 150/5300-13, *Airport Design*, allows for certain facilities to exist within the RPZ; however, when practical the FAA strongly discourages roads and power lines as they pose a safety risk to people on the ground and in aircraft.**

Using the assumption that Arndt Road and the power lines will not be relocated, Runway 17 can only be extended by 400 feet to retain consistency with FAA design standards. As stated above, there are no operational gains or reductions to constrained operations with a 400-foot extension, based on data gathered in Chapter Four.

Runway 35 would be extended by 600 feet to reach to optimal runway length of 6,004 feet, which would require a relocation of Keil Road in order to clear the RSA.

Property Acquisition

Implementation of this option would require the acquisition of real property and avigation easements to secure land use control within the RPZs. Avigation easements would be sought for approximately two



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SCALE
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General Notes

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Runway strengthened to 60,000 lbs dual wheel gear

01/05/12

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Aurora State Airport
Aurora, OR

Exhibit 5K
Runway Extension Alternative
Runway 17 - 400' & Runway 35 - 600'

034317-AIRP-EX5K_MC_2007.DWG

acres of land from Columbia Helicopters, which would limit their planned development. To the north of Arndt Road, approximately 5.5 acres would be acquired, along with approximately 37 acres to the south of Runway 35 that would include six residential properties. Property would also be acquired from Willamette Aviation for the Runway 17 parallel taxiway and run-up apron.

Departure / Approach Surface

As shown in Exhibit 5K, relocation of the Runway 17 threshold impacts the departure and approach surface. The departure surface extends upward and outward at a slope of 40:1 from the threshold. As the threshold moves north, the departure surface is lower over structures at **Columbia Helicopters**; thereby making them obstructions to navigation. Existing structures would likely be required to have obstruction lights; however, **future development may be restricted to prohibit penetrations to the departure surface.** Similarly, the approach surface, which begins 200 feet beyond the runway threshold, would be lowered over Arndt Road and the power lines. Although the power lines would remain below the approach surface, the safety margin between approaching aircraft would be reduced and that may result in an increase to the Airport's approach minimums, which are typically 1 ½ statute mile (sm) visibility for Category C and D aircraft (depending on the approach, Category C minimums are as low as 1 ¼ sm). Weather data shows that weather is below 1 sm visibility 5% of the time. The Airport would be below Approach Category C and D minimums a higher percentage of the time. Low visibility weather is not spread evenly throughout the year. In the months of May through August, visibility is below 1 sm less than 1% of the time on average, but in the months of November through January the weather is below approach minimums more than 10% of the time. Given this information, it would be imprudent to raise the existing minimums, which would virtually close the Airport in low visibility conditions.

Land Use

The majority of land identified for acquisition is currently zoned exclusive farm use. A portion of the land associated with home sites is zoned acreage residential. Land north of Arndt Road falls within the jurisdiction of Clackamas County; whereas everything to the south is within the Marion County boundary. Private property – Columbia Helicopters and Willamette Aviation – would be impacted by land acquisition and land use zoning restrictions on building height.

To maintain compatibility with FAA guidance, the acquired property should be rezoned to maintain airport compatibility.

Environmental

The anticipated environmental impact with this runway length option is minimal. Areas where potential impacts are expected include: water quality, farmland, noise, and temporary construction impacts. There would be increased stormwater runoff due to the increased impervious surface, which can be mitigated with adjustments to the existing stormwater drainage system. Farmlands would be minimally impacted; even though there is acquisition of farmland, farm-related activities could remain on the subject property consistent with FAA guidance. Noise is expected to increase over the planning period, as detailed in Chapter Five; however, the Airport's runway configuration has an insignificant impact on

noise according to FAA National Environmental Policy Act regulations. Temporary construction impacts will be offset by implementation of best management practices and impact avoidance.

Noise Abatement

New instrument departures, along with publish noise mitigation procedures and the use of the calm wind runway (Runway 35) are consistent with the northern runway length option. However, noise would be shifted slightly closer to the Charbonneau community.

Air Traffic Control Tower (ATCT)

Design of the ATCT included simulations at the FAA's Airway Facilities Tower Integration Laboratory (AFTIL). During that simulation no runway extension to the north was modeled. If a northern extension were pursued, the AFTIL work may need to be redone to ensure line of sight visibility from the ATCT to the extended runway end. The cost of the additional simulation could cost upwards of $200,000.

Construction

An extension to both ends of Runway 17/35 will require a two-phased construction approach. Temporary displaced thresholds will be utilized during construction, adding duplicate efforts for the contractor, adding time to construction and reducing operational efficiency of the airport.

Cost Estimate

The northern extension option is estimated to cost $9,606,000, as shown in the following table. Detailed cost estimates are attached for reference. A more detailed discussion regarding the cost estimating is included later in this analysis.

Northern Extension Option

#	Year	Description	Total Cost	ODA share	FAA Share
Runways 17 (400') and 35 (600') Extension					
14A	2018	Avigation Easement Acquisition (R17 RPZ)	$ 36,000.00	$ 1,800.00	$ 34,200.00
19A	2018	Property Acquisition (R17 and R35 RPZ)	$ 3,963,000.00	$ 198,150.00	$ 3,764,850.00
20A	2019	Keil Road Relocation	$ 1,427,000.00	$ 71,350.00	$ 1,355,650.00
21A	2020	Runway Extension (R17 - 400' Ext, R35 - 600' Ext)	$ 4,180,000.00	$ 209,000.00	$ 3,971,000.00
Runways 17 (400') and 35 (600') Extension Capital Costs			*$ 9,606,000.00*	*$ 480,300.00*	*$ 9,125,700.00*

Southern Extension Option

In an effort to make a valid comparison for the previous extension scenario, a 1,000-foot extension to the south will be compared against the Northern Extension Option. **Exhibit 5J** reflects the southern extension option, which is the State Aviation Board's Preferred Alternative presented in Chapter Five.



June 7, 2011

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Aurora State Airport
Aurora, OR

Exhibit 5J
Preferred Alternative
Revised 06/27/11

03437-AIRP-EX5J_MC.DWG

Key Features

The following discussion details the southern runway extension option to provide a comparison against the northern extension option.

Runway Length

Runway 35 would be extended to the south by 1,000 feet for a total runway length of 6,004 feet, which is the ideal runway length to reduce a majority of the Airport's constrained operations. Keil Road would be relocated, as a result of the extension.

Property Acquisition

Extending Runway 35 would require the relocation of four residences and agricultural lands amounting to approximately 44.5 acres. Additionally, avigation easements would be sought from Columbia Helicopters to secure control of approximately 2.6 acres in the existing Runway 17 RPZ.

Departure / Approach Surface

A southern extension to Runway 35 would require the removal of obstructions, namely trees, to clear the approach and departure surfaces. No other buildings or facilities will be affected.

Land Use

All land use actions would be within Marion County's jurisdiction. Official action would be to designate the acquired land to "Public" to ensure compatibility with airport operations. Per FAA guidance, some agricultural uses are compatible with airport operations. No development would occur within the areas to be acquired, beyond relocation of Keil Road.

Environmental

The environmental considerations for the southern extension option are similar to those stated above. Noise would shift slightly farther south as a result of the longer extension to Runway 35.

Noise Abatement

New instrument departures, along with published noise mitigation procedures and the use of the calm wind runway (Runway 35) are consistent with the northern runway length option. The new instrument departures, along with the noise abatement techniques, are a culmination of ODA's public involvement that included coordination with the Positive Aurora Airport Management group and local communities.

Air Traffic Control Tower

The AFTIL simulation included modeling of a 1,000-foot southern extension. Extending Runway 35 would not require any additional AFTIL modeling.

Construction

Extension of Runway 35 would require the use of a single temporary displaced threshold. Keil Road would be relocated prior to runway construction.

Cost Estimating

The cost associated with the southern runway extension option is $7,169,000, see details in the following table.

Southern Extension Alternative					
#	Year	Description	Total Cost	ODA share	FAA Share
Runway 35 (1000') Extension					
14	2018	Avigation Easement Acquisition (R17 RPZ)	$ 44,000.00	$ 2,200.00	$ 41,800.00
19	2018	Property Acquisition (R35 RPZ)	$ 2,561,000.00	$ 128,050.00	$ 2,432,950.00
20	2019	Keil Road Relocation	$ 1,427,000.00	$ 71,350.00	$ 1,355,650.00
21	2020	Runway Extension (R35 - 1000')	$ 3,116,000.00	$ 155,800.00	$ 2,960,200.00
22	2020	Install Runway 17 PAPIs	$ 65,000.00	$ 3,250.00	$ 61,750.00
Runway 35 (1000') Extension Capital Costs			*$ 7,169,000.00*	*$ 358,450.00*	*$ 6,810,550.00*

Comparison of the Two Options

Key differences between the northern and southern runway extension options are presented below.

Runway Length

A runway length of 6,004 feet would be achieved in both options.

Property Acquisition

Total property acquisition is greater for the southern runway extension option by a margin of approximately 13 acres. However, the northern extension option requires the acquisition of two additional homes, because the shorter extension of Runway 35 places the RPZ over more residences. The avigation easement with Columbia Helicopters is also greater in the northern extension option by 1.1acres. Also 0.8 acres would be purchased from Willamette Aviation for the Parallel Taxiway extension and the run-up apron.

Departure / Approach Surface

Both options require removal of trees to clear the departure and approach surfaces. However, an extension to the north will also require obstruction lighting for existing Columbia Helicopter buildings and will likely limit the businesses' future development opportunities or raise the Airport's approach minimums and impact the departure surfaces.

The northern extension option would allow Arndt Road and the adjacent power lines to exist within the RPZ, which the FAA allows and at the same time discourages. Since the approach surface would be closer to the road and power lines, it is likely the approach minimums will be raised – which is an undesirable consequence as it would make the Airport inaccessible during some low visibility conditions.

The southern extension option would create clear RPZs.

Land Use

Both alternatives will require the rezoning of exclusive farm use property to public, in order to ensure compatibility with airport operations. However, as stated above, farm-related activity can occur within the areas according to FAA guidance.

The northern extension option will require coordination with both Clackamas and Marion Counties. Statements given at the Master Plan's public meetings have lead the planning team and ODA to believe Marion County is a willing partner with the Airport. It is unclear at this time what Clackamas County's position would be during any potential rezoning actions.

Environmental

Noise exposure would shift slightly farther south in the southern runway extension option. However, the difference is minimal and more consistent with the calm wind runway and published noise abatement procedures.

Noise Abatement

There is no appreciable difference between the two options; however, the southern extension option would likely move noise farther from Charbonneau and closer to housing communities around Aurora.

Air Traffic Control Tower

Remodeling of the AFTIL simulation would likely be required under the northern extension option, which could cost up to $200,000. The southern extension is compatible with the current AFTIL modeling and no additional work would be necessary.

Construction

The construction phasing for the northern extension option – by use of two temporary displaced thresholds – creates duplicity of efforts, which is reflected in the cost estimating.

Cost Estimating

The northern extension option is $2,437,000 more than that of the southern extension option, an increase of roughly 35%. The primary causes for this increase is:

- Additional avigation easement acquisition from Columbia Helicopters
- Property acquisition of RPZ property north of Arndt Road (considered to have more value than land south of the Airport)
- Acquisition of property from Willamette Aviation
- Purchase of two additional residences, as a result of the shorter extension to Runway 35
- Additional pavement required for the Runway 17 run-up apron and connector taxiway, with corresponding lighting improvements
- Relocation of the Runway 17 omnidirectional approach lighting system (ODALS)
- Increased unit prices for temporary flagging, marking, signage, staging and mobilization, as well as project coordination, as a result of the two temporary displaced thresholds required to extend both runway ends in the northern extension option.

Summary

In terms of benefits to the Airport and reducing constrained operations, the northern and southern runway extension options are similar as they increase Runway 17/35 to the desired length of 6,004 feet. The greatest difference between the options is cost. **The northern extension would require an additional $2.4 million to construct** and yield no benefit above and beyond the southern extension. Intangible costs for the northern extension are also greater. **For instance, while FAA guidance would allow Arndt Road and the power lines within the Runway 17 RPZ, the agency recommends keeping them out of the RPZ when practical to increase safety, and the Airport's approach minimums would likely be impacted. Additionally, constraints to Columbia Helicopters are not desirable as they are a prominent employer within Marion County that creates over 400 family wage jobs.** Additionally, working with one county for land use actions is more desirable than creating a situation of going through land use revisions in two counties.

Although the FAA has directed ODA to consider extending the runway north on land already owned by the State, this supplemental information clearly shows that an extension on State-owned land does not alleviate the existing and forecasted constrained operations at the Airport. An extension of 1,000 feet, however, would allow for unconstrained operations by aircraft currently using the Airport. The cost of extending the runway via the northern extension option far exceeds the cost of the southern extension option and does not gain any appreciable benefit. **Therefore, the southern extension option – reflected by the Preferred Alternative – remains the recommended course of action.**

SUPPLEMENTAL DATA:

FAA Letter

U.S. Department
of Transportation
**Federal Aviation
Administration**

Northwest Mountain Region
Seattle Airports District Office
1601 Lind Avenue S.W., Suite 250
Renton, Washington 98057-3356

November 18, 2011

Mr. Mitch Swecker
Director, Oregon Department of Aviation
3040 25th Street, SE
Salem, OR 97302-1125

Dear Mr. Swecker,

This letter is in response to your recent submission of a Modification to Design Standards for the addition of a displaced threshold north of Runway 17 at the Aurora State Airport.

Although we realize it is the preference of the Aurora State Airport Board to pursue the 800 foot displaced threshold in order to minimize the impact to private property, the FAA's position is that this is not adequate justification for funding an extension of limited use. Since a 1000 foot Runway Safety Area can be achieved at the north end of the proposed 800 foot surface and the land is already located on airport property, we would support a full runway extension – not a displaced threshold.

In addition, we understand that once you receive this disapproval of the displaced threshold, a 1000 foot extension to the south end of the runway will be pursued. Since an extension to the south includes land that is not located on airport property, we would not fund this land acquisition as long as sufficient airport-owned property lies undeveloped to the north.

If you have any questions, you may contact Bruce Fisher at 425.227.2649 or me at 2657.

Sincerely,

Stanley C. Allison
Acting Manager, Seattle Airports District Office

cc: Mr. Rainse Anderson, WH Pacific, Inc.

Supplemental Data:

Excerpt from Chapter Four, Runway Length Calculation

Runway Length Justification Process

FAA guidance states that to justify funding a runway extension, at least 500 annual itinerant aircraft operations must exhibit a need for an extension now or within the next five years. Determining the particular aircraft model(s) critical for runway length is much easier at a commercial service airport than at a general aviation airport because at a commercial service airport individual airlines mostly use the same type of airplanes and they publish flight schedules that facilitate quantifying numbers of operations and stage lengths. Gathering such data for a general aviation airport is more difficult. In addition, the FAA requires rigorous justification for extending runways at general aviation airports, including documentation from the operators of airplanes needing a longer runway with the individual N numbers of their airplanes and number of constrained operations. A constrained operation is one that must reduce payload for takeoff, or stop en route for fuel, for example.

To quantify constrained operations at Aurora State Airport, questionnaires were distributed to the operators of larger aircraft that use the Airport frequently. Transient aircraft operators were identified from IFR flight plan records. The questionnaires received are in **Appendix I** and the operators who identified constrained operations are listed in **Table 4E**.

Table 4E contains a list of business jets that have operated at the Airport in recent years, as documented by IFR flight plans. The table also indicates which airplane models are based at the Airport and gives the number of constrained operations reported by based and transient users of the Airport. The table lists airplane models in the order of runway length required at maximum takeoff weight, from shortest to longest. Many models listed in the table need a longer runway at maximum takeoff weight than Aurora State Airport's 5,004 feet; these airplanes can use the Airport because they are operating at less than their maximum takeoff weights and/or the temperature is lower than 84 degrees. Usually, airplanes are constrained for takeoff due to high summer temperatures; however, for some airplanes operating under air taxi or fractional jet regulations, the constrained operation is landing on a wet or slippery runway. In addition, the lengths in Table 4E are based solely on aircraft performance requirements. Some operators may have additional requirements based on company operations specifications or insurance.

Table 4E. Business Jet Runway Length Requirements at Aurora State Airport

TYPE	ARC	Max. Takeoff Weight (lbs)	Takeoff Distance (MTOW)	Based at UAO	Constrained Operations Reported
CESSNA 551 CITATION II/SP	B-II	12,500	3,042	No	
CESSNA 501 CITATION I/SP	B-I	11,850	3,249	Yes	
CESSNA 500 CITATION	B-I	11,850	3,364	No	
CESSNA 550 CITATION II	B-II	13,300	3,433	No	
CESSNA 525 CITATION (CJ-1)	B-I	10,400	3,536	Yes	
CESSNA 525B CITATIONJET III (CJ-3)	B-II	13,870	3,651	Yes	JHRD Investment
CESSNA 560 CITATION V ULTRA	B-II	16,300	3,651	Yes	
LEARJET 31	C-I	16,500	3,915	No	
CESSNA 525A CITATIONJET II (CJ-2)	B-II	12,500	3,926	Yes	
CESSNA 560 CITATION ENCORE	B-II	16,830	4,087	Yes	
CESSNA 560 CITATION EXCEL	B-II	20,000	4,121	Yes	Management West
CESSNA 550 CITATION BRAVO	B-II	14,800	4,133	No	
RAYTHEON 390 PREMIER	B-1	12,500	4,353	No	
BEECHJET 400A/T/ T-1A JAYHAWK	C-I	16,100	4,786	No	
LEARJET 45	C-I	20,200	4,845	Yes	Premier Air
MITSUBISHI MU-300	B-I	14,630	4,936	No	
DASSAULT FALCON 900	B-II	45,500	5,373	No	
DASSAULT FALCON 50	B-II	37,480	5,413	No	
CESSNA 650 CITATION VII	C-II	23,000	5,568	Yes	
DASSAULT FALCON 7X	B-II	69,000	5,586	Yes	
DASSAULT FALCON 900 EX	C-II	48,300	5,723	Yes	CSIM
LEARJET 35/36	C-I	18,300	5,740	No	
CESSNA 750 CITATION X	C-II	36,100	5,901	No*	RJ2/DB Aviation
CESSNA 650 CITATION III/VI	C-II	21,000	5,912	Yes*	RJ2/DB Aviation
DASSAULT FALCON 2000	B-II	35,800	6,016	No	
RAYTHEON/HAWKER 125-1000 HORIZON	C-II	36,000	6,027	Yes	

**RJ2/DB Aviation plans to replace the Cessna 650 Citation III/VI with the Cessna 750 Citation X in the near future.*

Table 4E. Business Jet Runway Length Requirements at Aurora State Airport (cont.)

TYPE	ARC	Max. Takeoff Weight (lbs)	Takeoff Distance (MTOW)	Based at UAO	Constrained Operations Reported
IAI - ASTRA 1125	C-II	23,500	6,084	Yes	Novellus, American Medical Concepts, Transcendent Investments
LEARJET 55	C-I	21,500	6,096	No	
LEARJET 60	D-I	23,500	6,153	No	
RAYTHEON/HAWKER 125-800	B-I	28,000	6,176	Yes	WAC Charter
EMBRAER 135	C-II	41,887	6,177	No	Aero Air
GULFSTREAM IV	D-II	71,780	6,257	No	
IAI - GALAXY 1126/Gulfstream G200	C-II	34,850	6,314	No	Anonymous
BOMBARDIER CL-601	C-II	41,250	6,544	No	Anonymous, Aero Air
BOMBARDIER CL-604	C-II	47,600	6,544	No	Anonymous
GULFSTREAM V	D-III	89,000	6,877	No	Vulcan Flight
BOMBARDIER BD-700 GLOBAL EXPRESS	C-III	93,500	7,232	No	Vulcan Flight, Y2K Aviation

Source: WHPacific, 2010, using business jet characteristics published by the Central Region FAA in 2001, manufacturers' specifications, based aircraft from Oregon Department of Aviation aircraft registration records, constrained operators from runway length survey conducted in 2009 and 2010. List includes only business jet models that have documented operations at the Airport according to IFR flight plan records or an operator who wants to use the Airport. Takeoff distances are based only on aircraft performance; federal aviation regulations, company policies, or insurance requirements may require more length. Takeoff distances for standard conditions were adjusted (+14.8%) to account for design conditions at Aurora state Airport.

The runway lengths listed in Table 4E use the manufacturers' takeoff distance for standard conditions (sea level and 59 degrees F). These lengths were increased 14.8% to account for the higher elevation (200 feet MSL), higher design temperature (84 degrees), and runway gradient (2 feet of difference between runway high and low points). The formula for determining the amount of increase is:

Altitude Correction
(7% per 1,000' above sea level)

L = Takeoff length @ sea level
L1 = Length corrected for altitude
L1 = (.07 * E / 1000) * L + L

Temperature Correction
(0.5% per degree above standard temperature in hottest month)

T1 = Adjusted Standard Temperature
T = Mean Max High Temperature
L2 = Length corrected for altitude & temperature

(Std Temp adjusted to Sea Level)

T1 = 59 - (3.566 * E / 1000)
L2 = (.005*(T - T1)) * L1 + L1

Effective Gradient Correction (takeoff only)	
(10' for each 1' difference between High / Low Point)	G = Difference between high / low point in feet L3 = RW length corrected for altitude, temperature & gradient L3 = G * 10 + L2

For three aircraft models, operators report constrained operations although the takeoff distance listed in Table 4E is less than the length of Runway 17/35. Two mentioned constraints on hot summer days, which are likely days when the temperature exceeds 84 degrees.

The runway length survey (Appendix I) identified the number of aircraft operations constrained at the Airport annually total 473, using only existing aircraft with N numbers and operators' names identified and using the average number of constrained operations if the operator identified a range of operations. Operators who wished to remain anonymous identified 12 more annual constrained operations. One operator based at the Airport, RJ2/DB Aviation, plans to replace its 650 Citation III/VI with a 750 Citation X, which would be constrained by runway length more often (an estimated 40 times per year compared to 30 for the existing aircraft).

To justify funding a runway extension, the FAA will not accept information for which the operator or the aircraft is not specifically identified. The identified number of constrained operations, 473, does not meet the 500 operations threshold at present time. Applying to 473 an annual growth rate of 3.6%[1], the number of annual constrained operations would reach 500 in 2012.

The 500 annual constrained operations threshold is projected to occur within five years. Even if jet traffic does not grow as fast as projected, it is likely the number of constrained operations will exceed 500 within the 20-year planning period. Consequently, ODA may want to consider planning for a runway extension now, in order to protect the airspace needed, among other things. To justify FAA funding for a planned extension, operators may need to be surveyed again in the future to identify operations that may be constrained.

Table 4E indicates the longest runway required for ARC C-II aircraft (Bombardier CL-601 and CL-604) that use the Airport is 6,544 feet, at maximum takeoff weight. This is 1,540 feet longer than the existing Runway 17/35. The longest runway required for an Aircraft Approach Category B aircraft (Raytheon/Hawker 125-800) is 6,176 feet, at maximum takeoff weight. This is 1,172 feet longer than the existing Runway 17/35. Most takeoffs are at weights under the certified maximum, so that the runway length needed is less. On the other hand, temperatures in the summer can exceed the 84 degrees used to determine runway length in Table 4E.

In the formulation of development alternatives, one or more alternatives might consider a runway extension, in order to evaluate relevant consequences.

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[1] *Table 3M in Chapter Three shows the jet operations forecast, from 10,909 annual operations in 2010 to 22,389 annual operations in 2030, which equates to a 3.6% average annual growth rate.*

SUPPLEMENTAL DATA:

Cost Estimates

Aurora State Airport CIP Comparison Between Alternatives

#	Year	Description	Total Cost	ODA share	FAA Share	Private Share	Other Funding
Runway 35 (1000') Extension							
14	2018	Avigation Easement Acquisition (R17 RPZ)	$ 44,000.00	$ 2,200.00	$ 41,800.00	$ -	$ -
19	2018	Property Acquisition (R35 RPZ)	$ 2,561,000.00	$ 128,050.00	$ 2,432,950.00	$ -	$ -
20	2019	Keil Road Relocation	$ 1,427,000.00	$ 71,350.00	$ 1,355,650.00	$ -	$ -
21	2020	Runway Extension (R35 - 1000')	$ 3,116,000.00	$ 155,800.00	$ 2,960,200.00	$ -	$ -
22	2020	Install Runway 17 PAPIs	$ 65,000.00	$ 3,250.00	$ 61,750.00	$ -	$ -
Runways 17 (400') and 35 (600') Extension							
14A	2018	Avigation Easement Acquisition (R17 RPZ)	$ 36,000.00	$ 1,800.00	$ 34,200.00	$ -	$ -
19A	2018	Property Acquisition (R17 and R35 RPZ)	$ 3,963,000.00	$ 198,150.00	$ 3,764,850.00	$ -	$ -
20A	2019	Keil Road Relocation	$ 1,427,000.00	$ 71,350.00	$ 1,355,650.00	$ -	$ -
21A	2020	Runway Extension (R17 - 400' Ext, R35 - 600' Ext)	$ 4,180,000.00	$ 209,000.00	$ 3,971,000.00	$ -	$ -
Runway 35 (1000') Extension Capital Costs			*$ 7,169,000.00*	*$ 358,450.00*	*$ 6,810,550.00*	$ -	$ -
Runways 17 (400') and 35 (600') Extension Capital Costs			*$ 9,606,000.00*	*$ 480,300.00*	*$ 9,125,700.00*	$ -	$ -
Cost difference between the Alternatives			*$ 2,437,000.00*	*$ 121,850.00*	*$ 2,315,150.00*	$ -	$ -

Chapter Six: AIRPORT LAYOUT PLAN

Airport Master Plan Update

Aurora State Airport

The Airport Layout Plan (ALP) drawings are a pictorial culmination of the master planning process. A major purpose of the ALP drawing set is to establish funding eligibility for the FAA's Airport Improvement Program (AIP), as capital projects must appear on an FAA-approved ALP to receive AIP grant funding.

The ALP has been developed with input from the Planning Advisory Committee (PAC), as well as from the public. The Draft Preferred Alternative was available for public comment from March 31 through April 21, 2011. Based on direction from the Oregon Aviation Board on April 28, 2011, declared distances – through the means of displaced thresholds[1] – were analyzed and presented to the PAC and public on June 7, 2011 to gather input relative to runway length. Comments were taken on the declared distances until June 21, 2011. On June 23, 2011 the Oregon Aviation Board recommended the ALP include an 800-foot northward extension of runway pavement and 800-foot displaced threshold to Runway 17. The Board determined additional runway length is justified at the Aurora State Airport and the use of declared distances is the most advantageous and neighborly method of increasing the runway's usable length. However, if the FAA's National Office does not approve the displaced threshold, the Board recommends pursuing an extension to Runway 35. As a result, both the northern displaced threshold and southern extension are shown on the ALP drawing set. Only one of these projects will be pursued, as is reflected in the capital improvement plan in Chapter Seven. It is emphasized the preferred action, based on the Board's recommendation, is to pursue the displaced threshold to mitigate the runway length deficiency at the Airport.

AIRPORT LAYOUT PLAN DRAWINGS

The following paragraphs describe the specific elements found on each sheet within the ALP drawing set.

[1] Please refer to Chapter 5 for an explanation of displaced thresholds, their application to airport design, and the use of declared distances.

Cover Sheet (CS)

The cover sheet is an index to the airport layout plan drawing set. It also provides pertinent information such as the airport sponsor, airport name, grant number the project is funded through, location and vicinity maps, and date the plan was completed. Also included is the Airport wind rose, which depicts the wind data discussed in Chapter Four.

Airport Layout Plan (Sheet 1)

The ALP depicts the current airport layout and proposed improvements to the Airport for the 20-year planning period. Detailed descriptions of the improvements and expected capital costs over the next 20 years are included in Chapter Seven*, Capital Improvement Plan*. The Preferred Alternative was the basis for determining the proposed improvements at the Airport. The ALP is a development guide; the timing of development depends upon when it is needed and can be funded.

As recommended by the Oregon Aviation Board at their June 23, 2011 meeting, the ALP retains two alternatives relating to runway length. The ALP depicts an 800-foot displaced threshold to Runway 17 and a 1,000-foot extension to Runway 35. These projects are mutually exclusive and it is the preference of the Board to pursue the displaced threshold option. However, if the FAA does not approve the displaced threshold, the extension to Runway 35 will be pursued. When the FAA decides, the ALP will be updated to identify only the FAA-approved alternative.

Other items reflected on the ALP include, but are not limited to:

- Runway protection zone, runway object free area, runway safety area and other standard airport dimensions
- Runway approach visibility minimums
    - Runway 17 – Visibility of 1 statute mile (sm) or greater
    - Runway 35 – Existing visibility of 1 sm or greater; ultimate approach minima of greater than ¾ sm.
- Data tables for the Airport, as well as data relating to the runway and facilities at the Airport
- A table identifying the modifications to standards requested
    - Modification to the runway object free area is requested, as Highway 551 encroaches into the area slightly.
    - Modification of the application of a displaced threshold to reduce off-airport impact from Part 77 and airport design surfaces.
- Land identified for avigation easement acquisition and fee acquisition
- Capital projects recommended in Chapter Five

Airport Airspace (Sheet 2)

This drawing shows the Part 77 Imaginary Surfaces for the future layout of the Airport with a USGS topographic map as the background. The Part 77 surfaces are the basis for protecting airspace around an airport; therefore, it is ideal to keep these surfaces clear of obstructions whenever possible. The FAA decides if any of the obstructions to Part 77 surfaces are hazardous to aviation. Recent obstruction removal projects at and near the Airport have cleared these surfaces of any known obstructions.

Part 77 defines five distinct surfaces, each with a different size and shape. The dimensions of these surfaces are based on the type of runway and the type of approach ultimately planned for the Airport. The imaginary surfaces are defined below.

Primary Surface. The primary surface is rectangular, is centered on the runway, extends 200 feet beyond each end of the runway, and has a width that varies according to airport-specific criteria. The elevation of the primary surface corresponds to the elevation of the nearest point of the runway centerline. The width of the primary surface of Runway 17/35 is 500 feet.

Approach Surface. Each runway end has an approach surface. The approach surface is centered on the extended runway centerline, starts at the end of the primary surface (200 feet beyond each end of the runway), and has a width equal to that of the primary surface. Approach surfaces slope upward and outward from the runway ends.

The ultimately planned approach surfaces at the Airport reflect nonprecision instrument approaches to Runways 17 and 35. The approach surface has an inner width of 500 feet, extends outward 10,000 feet to an outer width of 3,500 feet, and rises up at a slope of 34:1.

Runway Protection Zones (RPZs) are not Part 77 surfaces, but mirror the inner portions of approach surfaces on the ground. The existing and ultimate Runway 17 RPZ dimensions are 500 feet (inner width) by 1,700 feet (length) by 1,010 feet (outer width). The existing Runway 35 RPZ dimensions mirror the Runway 17 dimensions. However, the ultimate Runway 35 RPZ dimensions are 1,000 feet (inner width) by 1,700 feet (length) by 1,510 feet (outer width), to accommodate the approach with minimums greater than ¾ sm.

Transitional Surface. The transitional surface is a sloping 7:1 surface that extends outward and upward at right angles to the runway centerline from the sides of the primary surface and from the sides of the approach surfaces.

Horizontal Surface. The horizontal surface is a flat, elliptical surface at an elevation 150 feet above the established airport elevation. The extent of the horizontal surface is determined by swinging arcs of a 10,000-foot radius from the center of each end of the primary surface.

Conical Surface. The conical surface extends outward and upward from the horizontal surface at a slope of 20:1 for a horizontal distance of 4,000 feet.

Airport Approach Surfaces (Sheet 3)

This drawing presents a larger scale plan and profile view of the approach surfaces shown in the Airport Airspace Drawing. The existing and ultimate runway ends are shown on the plan sheet. The highest composite terrain, along with known features, is shown in the profile view. There are no known obstructions within the Airport's approach surface.

Inner Portion of the Runway 17/35 Approach Surfaces (Sheet 4)

This drawing provides plan and profile views of the portions of approach surfaces that are closest to the runway, encompassing the existing and ultimate RPZs.

Terminal Area Plan (Sheet 5)

The Terminal Area Plan drawing provides a large-scale view of the terminal area, so that features such as aprons, buildings, hangars, and parking lots are easier to discern.

Land Use and Noise Contours (Sheet 6 and 7)

A land use map has been developed for the Airport and the surrounding area. This map includes the land uses on and around the Airport according to Marion and Clackamas Counties, as applicable.

Land uses around airports should be compatible with airport operations. Land use compatibility issues that are of the greatest concern at airports include:

- Aircraft Noise
- Nearby Lighting
- Glare, Smoke and Dust Emissions
- Bird Attractions and Landfills
- Airspace Obstructions
- Electrical Interference
- Concentrations of People

Current zoning on Airport Property is listed as Public and is compatible with airport operations. However, not all property within the Airport Environs – the footprint of the land nearby the Airport within the boundaries of the four surrounding roads – is zoned in a manner suitable for airport-related development recommended in this Master Plan. Marion County has land use jurisdiction over the subject property and any private developer would have to work with the County to ensure proper zoning is in place prior to any development.

Noise contours were developed for the Airport, based on existing and forecasted aircraft operations, in accordance with FAA regulations using the Integrated Noise Model (INM) version 7.0. INM produces contours representative of average weighted sound exposure levels. According to FAA guidance, 65 dBA is the threshold for aircraft noise incompatibility with some land uses. [2] The three noise contour sets modeled for the Airport are:

- Existing Conditions (2010) - At present, the 65 dBA contour line extends off Airport Environs to the north, south and west. Some residential areas west of the Airport are within the 65 dBA and the 70 dBA lines.
- Displaced Threshold Option (2020) - The forecasted increase in operations and changes in aircraft fleet, cause the 65 dBA contour line to extend further off airport by 2020; however, the eastern 65 dBA noise contour line remains nearly all within the Airport Environs. More

[2] For more information about land use incompatibility with airport noise, see FAA Advisory Circular 150/5020-1, *Noise Control and Compatibility Planning for Airports.*

residential homes would be affected by noise exposures of 65 dBA. The displaced threshold to Runway 17 does not cause a significant shift northward of the contour lines.

- Runway Extension Option (2020) - As a result of the extension southward, the noise profile shifts to the south when compared to the previous profiles. Under this option, noise is shifted further away from Charbonneau, but closer to the City of Aurora and its surrounding communities.

Details of how the noise contours were developed are discussed in Chapter Five, *Airport Development Alternatives*.

Runway Departure Surfaces (Sheet 8)

The Runway Departure Surfaces Plan depicts the plan and profile views of the Runway 17/35 departure surfaces, which apply to runways with instrument departure procedures. Each departure surface at the Airport begins at the departure end of the runway at a width of 1,000 feet, extends outward 10,200 feet to an outer width of 6,466 feet, and slopes up at 40:1.

Airport Property Map (Sheet 9)

This drawing provides a history of the ODA's airport property acquisition by showing and listing all land transactions.

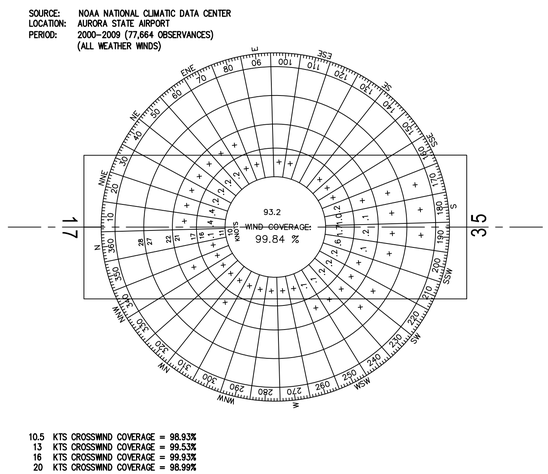
Marion County, OR

Aurora State Airport

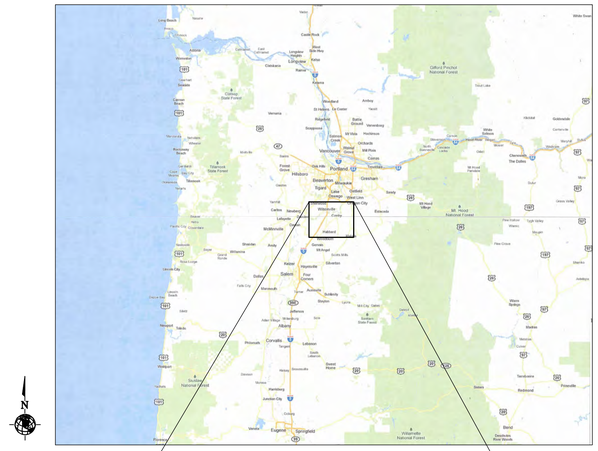
Master Plan Update

A.I.P. #3-41-0004-015

March 2012



WIND ROSE



LOCATION MAP



VICINITY MAP

SOURCE: GOOGLE MAPS

SHEET INDEX

No.	DESCRIPTION
CS	COVER SHEET
1	AIRPORT LAYOUT PLAN DRAWING
2	AIRPORT AIRSPACE DRAWING
3	AIRPORT APPROACH SURFACES DRAWING
4	INNER PORTION OF THE APPROACH SURFACES DRAWING
5	TERMINAL AREA DRAWING
6	LAND USE PLAN & 2010/2020 NOISE CONTOURS
7	RUNWAY DEPARTURE SURFACES DRAWING
8	EXHIBIT 'A' PROPERTY MAP
9	EXHIBIT 'A' PROPERTY ACQUISITION

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COVER SHEET

OREGON DEPARTMENT OF AVIATION
AURORA STATE AIRPORT ~ MASTER PLAN UPDATE

PROJECT NUMBER	DRAWING FILE NAME	SCALE
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SHEET NUMBER

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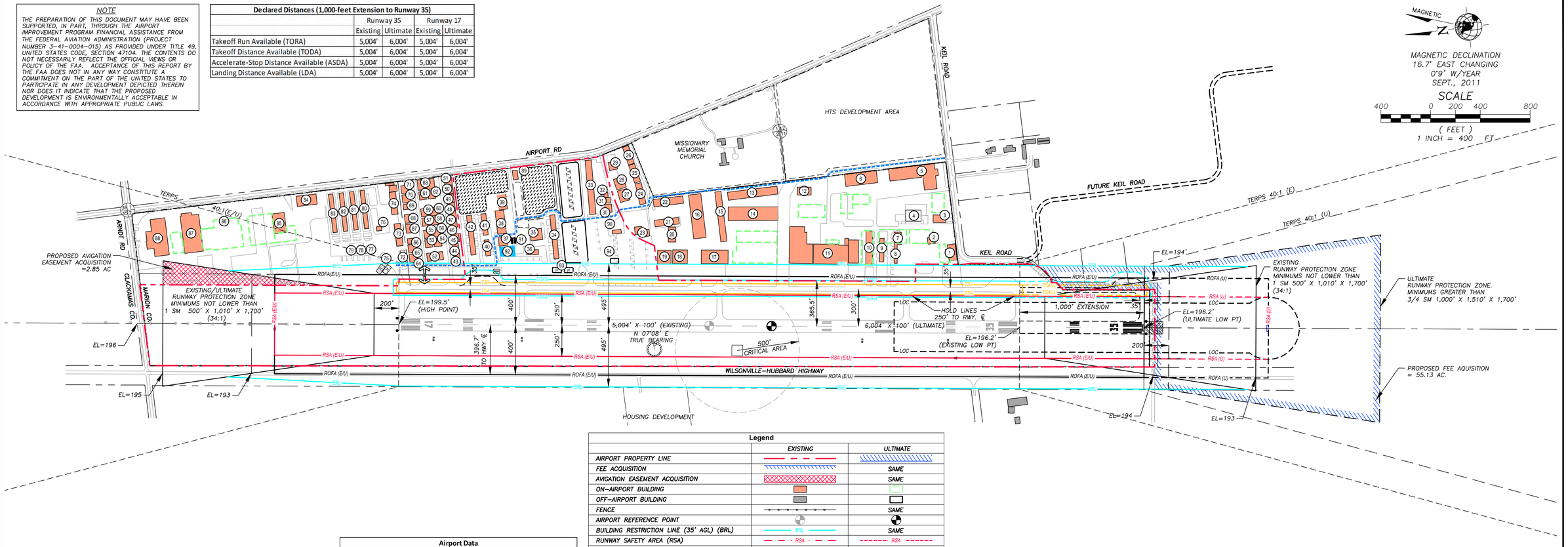
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NOTE

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Declared Distances (1,000-feet Extension to Runway 35)

	Runway 35		Runway 17	
	Existing	Ultimate	Existing	Ultimate
Takeoff Run Available (TORA)	5,004'	6,004'	5,004'	6,004'
Takeoff Distance Available (TODA)	5,004'	6,004'	5,004'	6,004'
Accelerate-Stop Distance Available (ASDA)	5,004'	6,004'	5,004'	6,004'
Landing Distance Available (LDA)	5,004'	6,004'	5,004'	6,004'



Legend

	EXISTING	ULTIMATE
AIRPORT PROPERTY LINE		
FEE ACQUISITION		SAME
AVIGATION EASEMENT ACQUISITION		SAME
ON-AIRPORT BUILDING		
OFF-AIRPORT BUILDING		
FENCE		SAME
AIRPORT REFERENCE POINT		
BUILDING RESTRICTION LINE (35' AGL) (BRL)	BRL	SAME
RUNWAY SAFETY AREA (RSA)	RSA	RSA
RUNWAY OBJECT FREE AREA (ROFA)	ROFA	ROFA
RUNWAY PROTECTION ZONE (RPZ)		
EXTENDED RUNWAY CENTERLINE		SAME
DISPLACED THRESHOLD	N/A	
RUNWAY HOLDLINE		SAME
TAXIWAY SAFETY AREA (TSA)	TSA	TSA
TAXIWAY OBJECT FREE AREA (TOFA)	TOFA	TOFA
SERVICE ROAD	N/A	
HANGAR DEVELOPMENT AREA		SAME
APRON / TIEDOWN AREA		
WINDCONE & SEGMENTED CIRCLE		SAME
VASI		SAME
PAPI	N/A	
REIL		SAME
ODAL		
LOCALIZER		
LOCALIZER CRITICAL AREA	LOC	SAME
CARGO APRON	N/A	
PAVEMENT		
PAVEMENT REMOVAL		SAME
FUEL TANKS		
HELICOPTER PARKING	H	H
RESIDENTIAL THROUGH THE FENCE ACCESS (RTTF)		SAME

Airport Data

	Existing	Ultimate
Airport Elevation (MSL)	199.5'	Same
Airport Reference Point (ARP)		
Latitude	45°14'54.085"N	45°14'44.758"N
Longitude	122°46'11.405"W	122°46'13.040"W
Mean Maximum Temperature	84°	Same
Airport Reference Code (ARC)	C-II	C-II
Airport Service Level	General Aviation	Same
Design Aircraft	IAI Astra 1125	Cessna Citation X

Runway 17/35 Data

	Existing	Ultimate
Percent Effective Gradient	0.06%	Same
Percent Wind Coverage (10.5 kts)	98.93%	Same
Maximum Elevation Above MSL	199.5'	Same
Runway Length	5,004'	6,004'
Runway Width	100'	Same
Runway Surface Type	Asphalt	Same
Runway Strength (Dual Wheel Gear)	45,000 lbs	60,000 lbs
FAR Part 77 Approach Category		
Runway 17	C (NP)	Same
Runway 35	C (NP)	D (NP)
Approach Type	Nonprecision	Same
Runway 17	Not lower than 1 sm	Same
Runway 35	Not lower than 1 sm	Not lower than 3/4 sm
Approach Slope (Required / Clear)	34:1 / 34:1	Same
Runway Lighting	MIRL	Same
Runway Marking	Precision	Same
Taxiway Lighting	MITL / Reflectors	Same
Taxiway Marking	Standard	Same
Navigation Aids	LOC/DME, NDB	Same
Visual Aids	ODALS, VASI, REIL	ODALS, PAPI, REIL
Runway Safety Area Dimension	500' x 1,000' beyond rwy end	Same
Runway Object Free Area Dimension	800' x 1,000' beyond rwy end	Same
Runway Obstacle Free Zone (OFZ)	No OFZ Penetrations	Same
Runway End Coordinates		
Runway 17 Latitude	45°15'14.166"N	Same
Longitude	122°46'07.828"W	Same
Runway 35 Latitude	45°14'25.148"N	45°14'15.350"N
Longitude	122°46'16.515"W	122°46'18.251"W

Notes

Horizontal datum is NAD 1983, vertical datum is NAVD88.

The Airport is flat. Elevations / ground contours vary by less than 5 feet and are not shown. Drainage features are typically 2-3 feet lower than adjacent land.

Building restriction line is based on a 35-foot building located 495 feet from the runway centerline not penetrating FAR Part 77 surfaces for the Airport.

A Residential Through The Fence (RTTF) access exists at hangar #64 at the Wylee Condominium Association. The tenant is the resident caretaker for the airport.

Modifications to Standards

	Standard Being Modified	Proposed Action
1	Advisory Circular (AC) 150/5300-13, para 307 (Runway Object Free Area)	The standard runway object free area (OFA) for Airport Reference Code C-II airports is 800 feet. Highway 551 runs north/south parallel to Runway 17/35; the approximate distance from the Runway 17/35 centerline to the Highway 551 centerline is 400 feet. As the airport geometry is not changing from the current condition, the Oregon Department of Aviation (ODA) requests a modification of the OFA design standard to allow the runway and highway to remain in their current positions.
2	AC 150/5300-13, Appendix 14 (Declared Distances)	The ODA requests the existing threshold for Runway 17 be referenced in determining FAR Part 77 surfaces and design standard surfaces referenced in AC 150/5300-13 (*i.e.*, RSA, RPZ, OFA, OFZ).

Airport Facilities and Buildings Legend

Building No. Existing	Building No. Ultimate	Name / Owner	Use	Estimated Top Elevation (AGL)
1		Leased by Aurora Jet Center	Maintenance, Aircraft Storage	27'
2		Aurora Jet Center	Fixed Base Operator	22'
3		Private Southend Hangar	Aircraft Storage	19'
4		BPS Associates	Aircraft Storage	23'
5		Van's Aircraft	Business	30'
6		Artex	Business	26'
7, 8		Foxtrot Hangars / Southend Airpark	Aircraft Storage	21'
9		Hangar Row G / Southend Airpark	Aircraft Storage	13'
10		Hangar Row H / Southend Airpark	Business, Aircraft Storage	21'
11		Hangar India, Juliet & Kilo / Southend Airpark	Business, Aircraft Storage	38'
12		Winco	Business	29'
13		Hangar November / Southend Airpark	Business, Aircraft Storage	29'
14		Hangar Mike / Southend Airpark	Business, Aircraft Storage	31'
15 – 17		Airport Aviation Condo Association	Aircraft Storage	32'
18		Airport Aviation Condo Association	Aircraft Storage	32'
19		Aurora Aviation	Maintenance	26'
20 – 22		Airport Aviation Condo Association	Aircraft Storage	25'
23		Columbia Aviation Association	Clubhouse	21'

Airport Facilities and Buildings Legend

Building No. Existing	Building No. Ultimate	Name / Owner	Use	Estimated Top Elevation (AGL)
24 – 26		Meridian Condos	Business	23'
27 – 29		Pacific Coast Aviation	Business	26'
30 – 33		Oregon Dept. of Aviation	Aircraft Storage	25'
34		Columbia Helicopters	Aircraft Storage	22'
35		Columbia Helicopters	Maintenance	28'
36		Aurora Aviation	Fixed Base Operator	16'
37		Pitts Hangar	Aircraft Storage	26'
38 – 42		Aurora Business Park	Aircraft Storage	25'
43 – 71		Wylee Condo Association	Aircraft Storage	27'
72		Civil Air Patrol Building	Aircraft Storage	26'
73		Sunset Helicopters	Business	26'
74		Aerometal	Business	27'
75		Willamette Aviation	Aircraft Fueling	7'
76		Willamette Aviation	Fixed Base Operator	12'
77 – 83		Willamette Aviation	Aircraft Storage	16'
84		Marlow Treit	Aircraft Storage	22'
85 – 88		Columbia Helicopters	Business	30'
89		Fire Suppression Tanks	Fire Suppression	12'
	90	Aurora Rural Fire Protection District	Emergency Response	TBD
	91	Aurora Aviation	Aircraft Fueling	16'
	92	Oregon Dept. of Aviation	Cargo Apron	N/A
	93	Oregon Dept. of Aviation	Helicopter Parking	N/A
	94	Oregon Dept. of Aviation	Air Traffic Control Tower	90'

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TITLE DATE:

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SIGNATURE

TITLE DATE:

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AIRPORT LAYOUT PLAN DRAWING

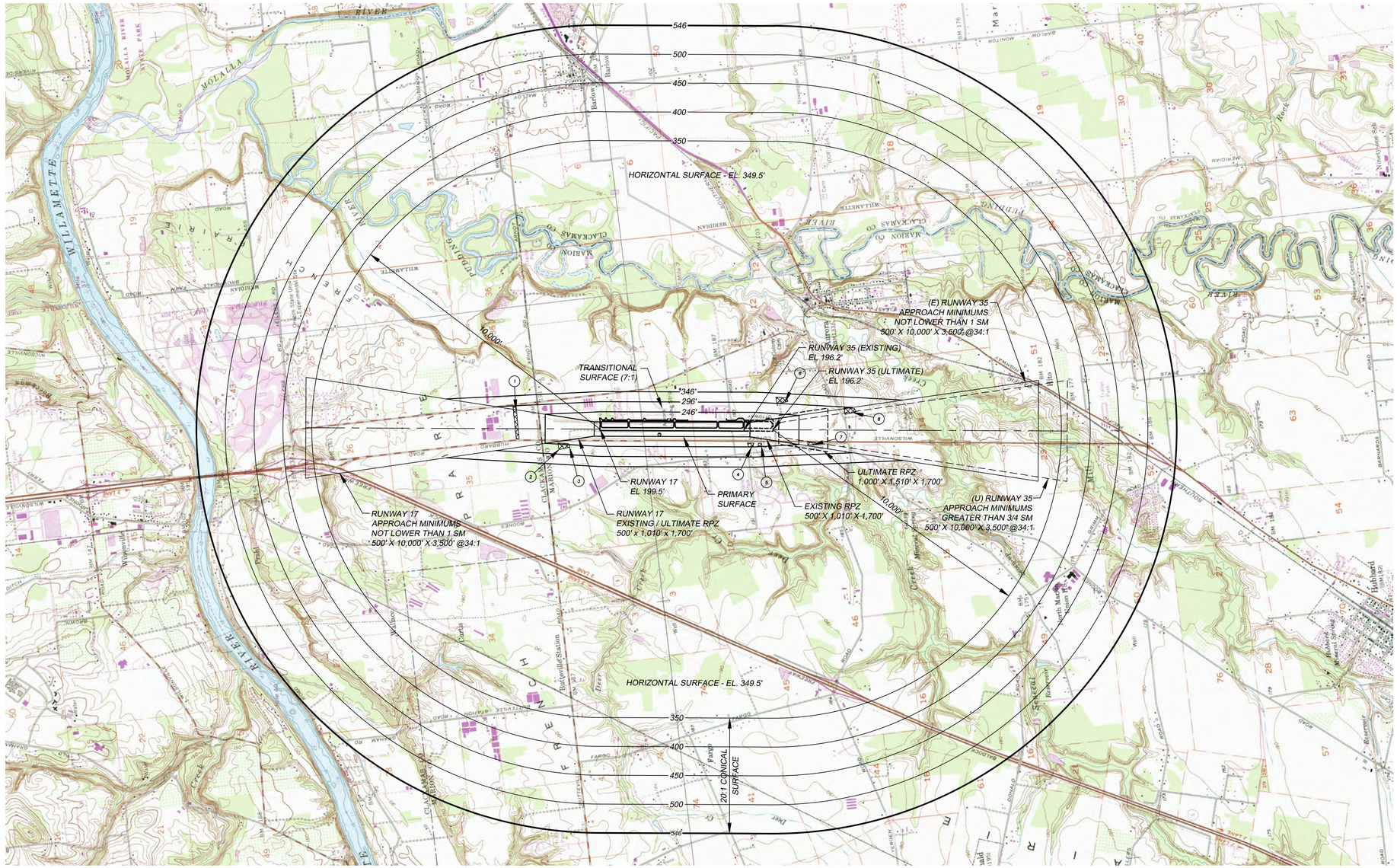
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PROJECT NUMBER	DRAWING FILE NAME	SCALE
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SHEET NUMBER 1

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XREF INDEX:



NO Ⓧ	ITEM	PART 77 SURFACE	FUTURE PART 77 SURFACE	ELEV	OFFSET FROM RWY CL	DISTANCE FROM RWY END	ESTIMATED AMOUNT OF PENETRATION	AIRPORT PROPERTY	DISPOSITION
1	TREE GROUP	APPROACH (RWY 17)	SAME	269'	0 R	3028'	(–2)	NO	CLEAR TREES
2	W. END TREE LINE	NONE	APPROACH (RWY 17)	303'	491' R	1590'	67'	NO	CLEAR TREES
3	E. END TREE LINE	NONE	APPROACH (RWY 17)	294'	491' R	715'	80'	NO	CLEAR TREES
4	TREE GROUP	TRANSITIONAL (RWY 35)	APPROACH (RWY 35)	248'	453' L	270'	51'	NO	CLEAR TREES
5	TREE GROUP	TRANSITIONAL (RWY 35)	APPROACH (RWY 35)	268'	460' L	435'	68'	NO	CLEAR TREES
6	TREE GROUP	TRANSITIONAL (RWY 35)	TRANSITIONAL (RWY 35)	276'	940' R	2060'	30'	NO	CLEAR TREES
7	TREE GROUP	TRANSITIONAL (RWY 17)	APPROACH (RWY 35)	282'	423' L	2540'	20'	NO	CLEAR TREES
8	TREE GROUP	APPROACH (RWY 35)	APPROACH (RWY 35)	286'	557' R	3760'	(–2')	NO	CLEAR TREES

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NO.	BY	DATE	REMARKS

AIRPORT AIRSPACE DRAWING

OREGON DEPARTMENT OF AVIATION
AURORA STATE AIRPORT ~ MASTER PLAN UPDATE

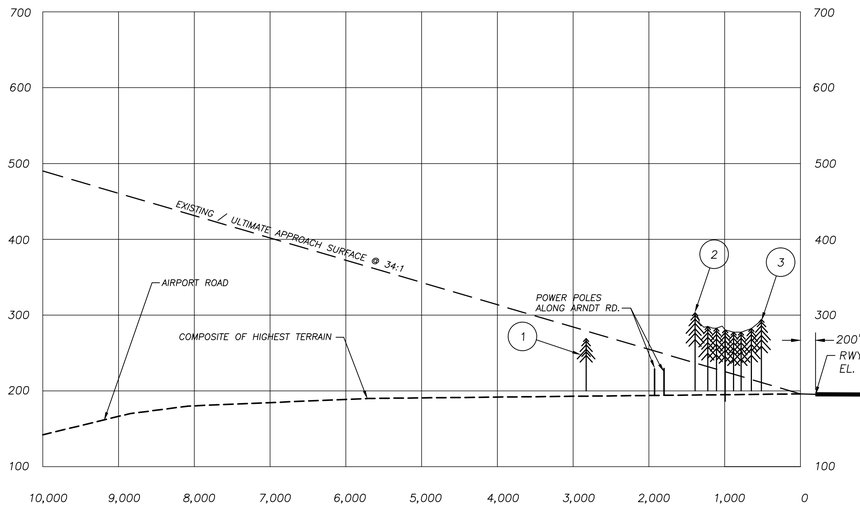
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RUNWAY 17



HORIZONTAL SCALE

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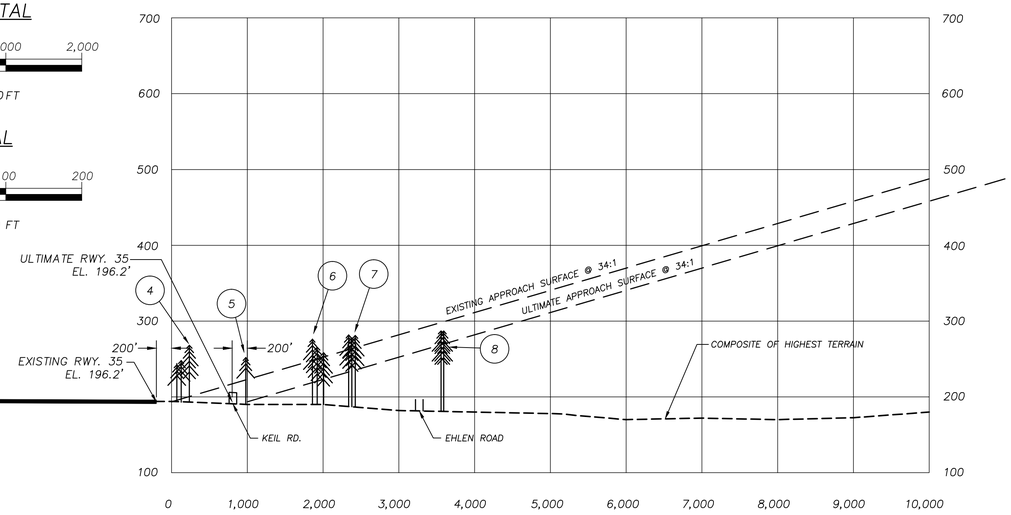
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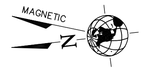
VERTICAL SCALE

100 0 50 100 200

(FEET)
1 INCH = 100 FT

RUNWAY 35





MAGNETIC DECLINATION
16.7° EAST CHANGING
0°9' W/YEAR

NO. (X)	ITEM	PART 77 SURFACE	FUTURE PART 77 SURFACE	ELEV	OFFSET FROM RWY CL	DISTANCE FROM RWY END	ESTIMATED AMOUNT OF PENETRATION	AIRPORT PROPERTY	DISPOSITION
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AIRPORT APPROACH SURFACES DRAWING

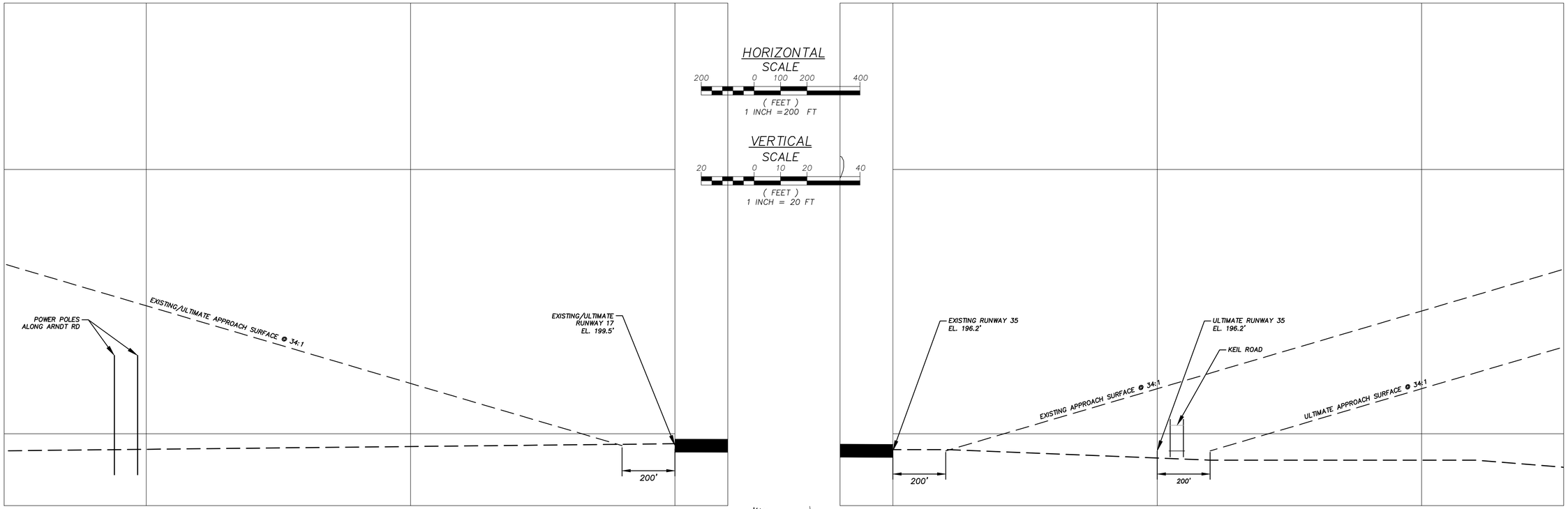
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REVISIONS			
NO.	BY	DATE	REMARKS

INNER PORTION OF THE APPROACH SURFACES DRAWING

OREGON DEPARTMENT OF AVIATION
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PROJECT NUMBER	DRAWING FILE NAME	SCALE
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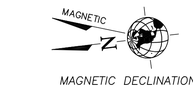
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Airport Facilities and Buildings Legend

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74		Aerometal	Business	27'
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76		Willamette Aviation	Fixed Base Operator	12'
77 – 82		Willamette Aviation	Aircraft Storage	16'
89		Fire Suppression Tanks	Fire Suppression	12'
	90	Aurora Rural Fire Protection District	Emergency Response	TBD
	91	Aurora Aviation	Aircraft Fueling	16'
	92	Oregon Dept. of Aviation	Cargo Apron	N/A
	93	Oregon Dept. of Aviation	Helicopter Parking	N/A
	94	Oregon Dept. of Aviation	Air Traffic Control Tower	90'

A Residential Through The Fence (RTTF) access exists at hangar #64 at the Wylee Condominium Association. The tenant is the resident caretaker for the airport.



MAGNETIC DECLINATION
16.7° EAST CHANGING
0°9' W/YEAR
SEPT., 2011

SCALE
100 0 50 100 200
(FEET)
1 INCH = 100 FT

Legend

	EXISTING	ULTIMATE
AIRPORT PROPERTY LINE		
FEE ACQUISITION		SAME
AVIGATION EASEMENT ACQUISITION		SAME
ON–AIRPORT BUILDING		
OFF–AIRPORT BUILDING		
FENCE		SAME
AIRPORT REFERENCE POINT		
BUILDING RESTRICTION LINE (35' AGL) (BRL)	BRL	SAME
RUNWAY SAFETY AREA (RSA)	RSA	RSA
RUNWAY OBJECT FREE AREA (ROFA)	ROFA	ROFA
RUNWAY PROTECTION ZONE (RPZ)		
EXTENDED RUNWAY CENTERLINE		SAME
DISPLACED THRESHOLD	N/A	
RUNWAY HOLDLINE		SAME
TAXIWAY SAFETY AREA (TSA)	TSA	TSA
TAXIWAY OBJECT FREE AREA (TOFA)	TOFA	TOFA
SERVICE ROAD	N/A	
HANGAR DEVELOPMENT AREA		SAME
APRON / TIEDOWN AREA		
WINDCONE & SEGMENTED CIRCLE		SAME
VASI		SAME
PAPI	N/A	
REIL		SAME
ODAL		
LOCALIZER		
LOCALIZER CRITICAL AREA	LOC	SAME
CARGO APRON	N/A	
PAVEMENT		
PAVEMENT REMOVAL		SAME
FUEL TANKS		
HELICOPTER PARKING	H	H
RESIDENTIAL THROUGH THE FENCE ACCESS (RTTF)		SAME

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OREGON DEPARTMENT OF AVIATION

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SHEET INFO	
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DRAWN	RAI
CHECKED	REA
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REVISIONS			
NO.	BY	DATE	REMARKS

TERMINAL AREA DRAWING

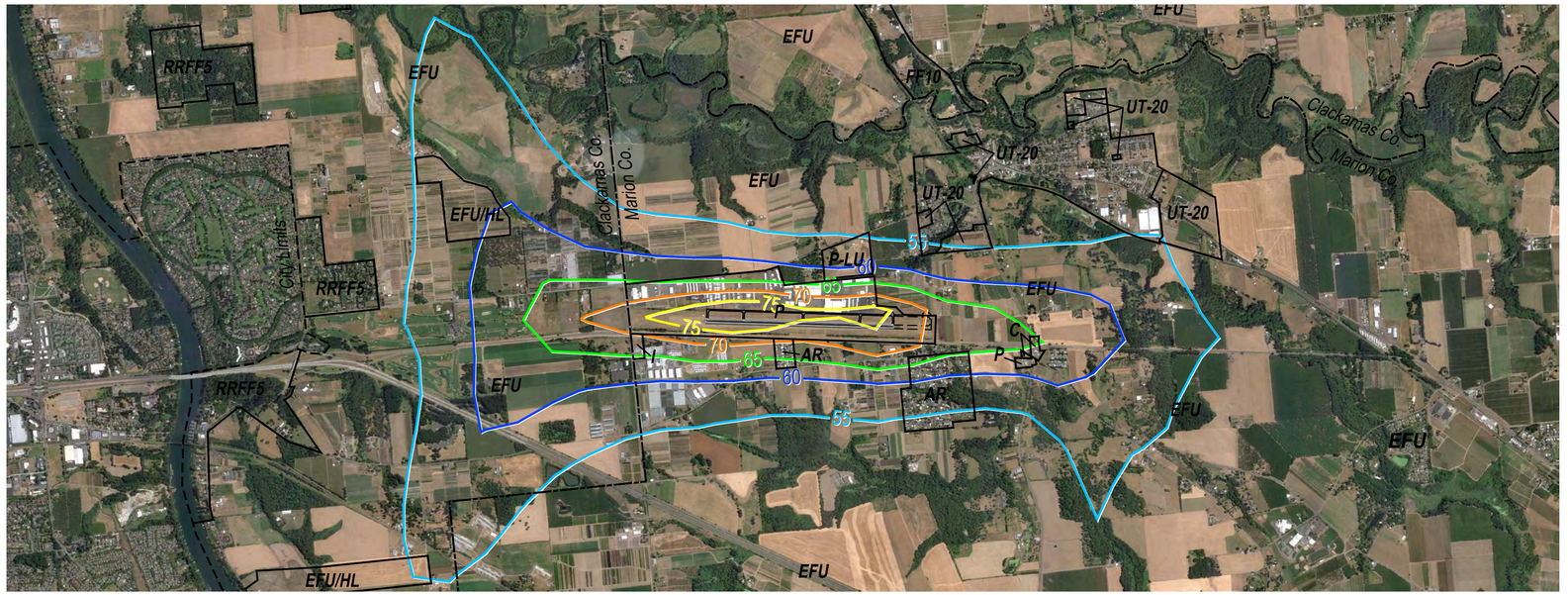
OREGON DEPARTMENT OF AVIATION
AURORA STATE AIRPORT ~ MASTER PLAN UPDATE

PROJECT NUMBER	DRAWING FILE NAME	SCALE
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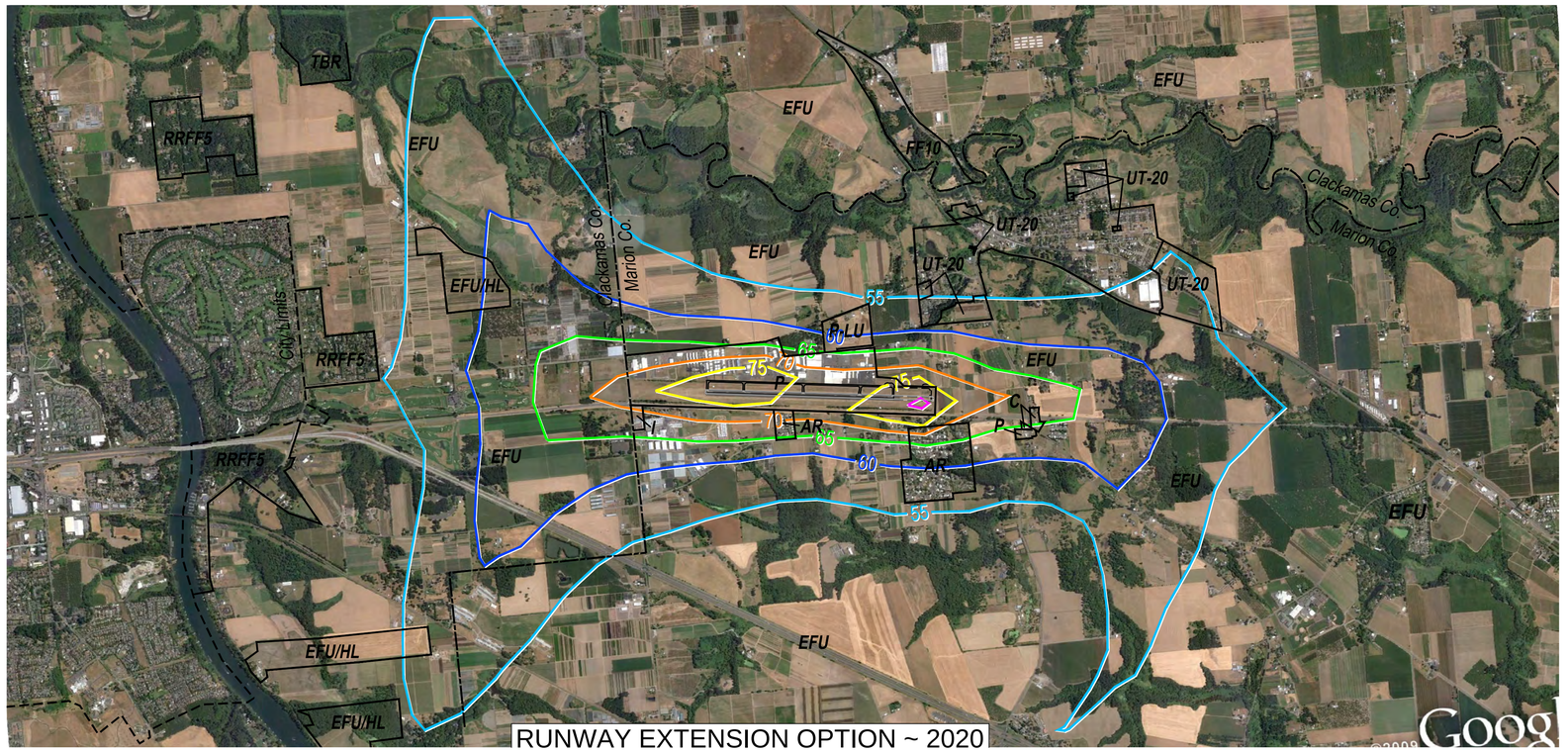
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XREF INDEX:



EXISTING CONDITIONS ~ 2010



RUNWAY EXTENSION OPTION ~ 2020

NOTE:
NOISE CONTOURS DEVELOPED IN ACCORDANCE WITH FAA REGULATIONS USING THE INTEGRATED NOISE MODEL (INM) VERSION 7.0. INM IS AN AVERAGE VALUE MODEL AND IS DESIGNED TO ESTIMATE LONG-TERM EFFECTS USING AVERAGE ANNUAL INPUT CONDITIONS. OPERATIONS DATA TAKEN FROM FAA-APPROVED FORECASTS PRESENTED IN CHAPTER 3 OF THE 2011 MASTER PLAN UPDATE. PLEASE REFER TO CHAPTER 5 FOR MORE INFORMATION REGARDING THE NOISE CONTOUR PREPARATION.

MAGNETIC DECLINATION
16.7° EAST CHANGING
0°9' W/YEAR

SCALE
2,000 0 1,000 2,000 4,000
(FEET)
1 INCH = 2,000 FT

MARION COUNTY, OR

ZONING

AR	ACREAGE RESIDENTIAL
C	COMMERCIAL
EFU	EXCLUSIVE FARM USE
I	INDUSTRIAL
P	PUBLIC
UT-20	URBAN TRANSITION

CLACKAMAS COUNTY, OR

ZONING

EFU	EXCLUSIVE FARM USE
EFU/HL	EXCLUSIVE FARM USE/HISTORIC LANDMARK
FF-10	FARM-FOREST 10 ACRE
RRFF5	RURAL RES/FARM/FOREST 5 ACRE
TBR	TIMBER DISTRICT

LEGEND

- 55 NOISE CONTOUR
- ZONE LINE
- COUNTY LINE
- CITY LIMIT

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REVISIONS			
NO.	BY	DATE	REMARKS

LAND USE PLAN & 2010/2020 NOISE CONTOURS

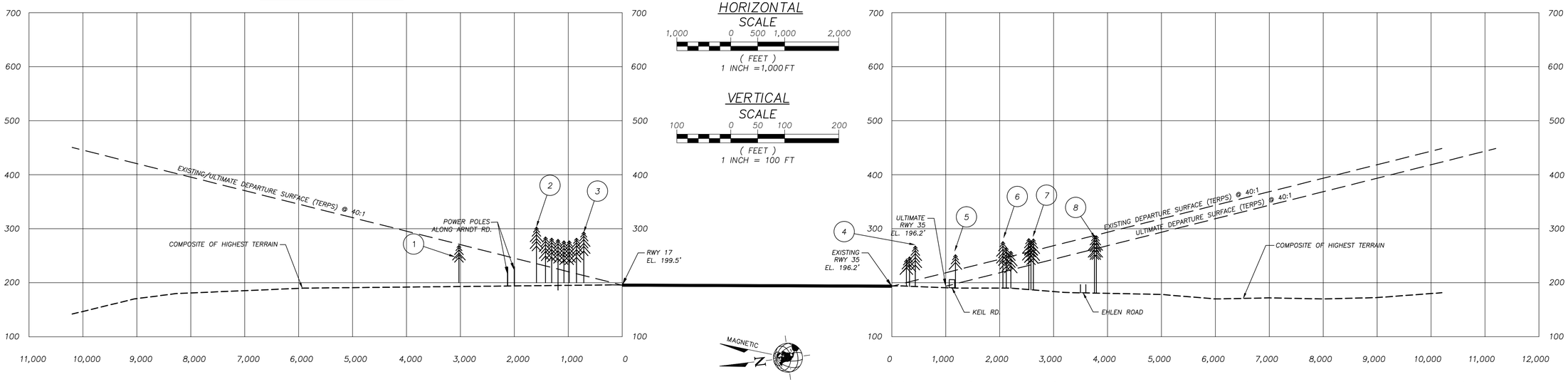
OREGON DEPARTMENT OF AVIATION
AURORA STATE AIRPORT ~ MASTER PLAN UPDATE

PROJECT NUMBER	DRAWING FILE NAME	SCALE
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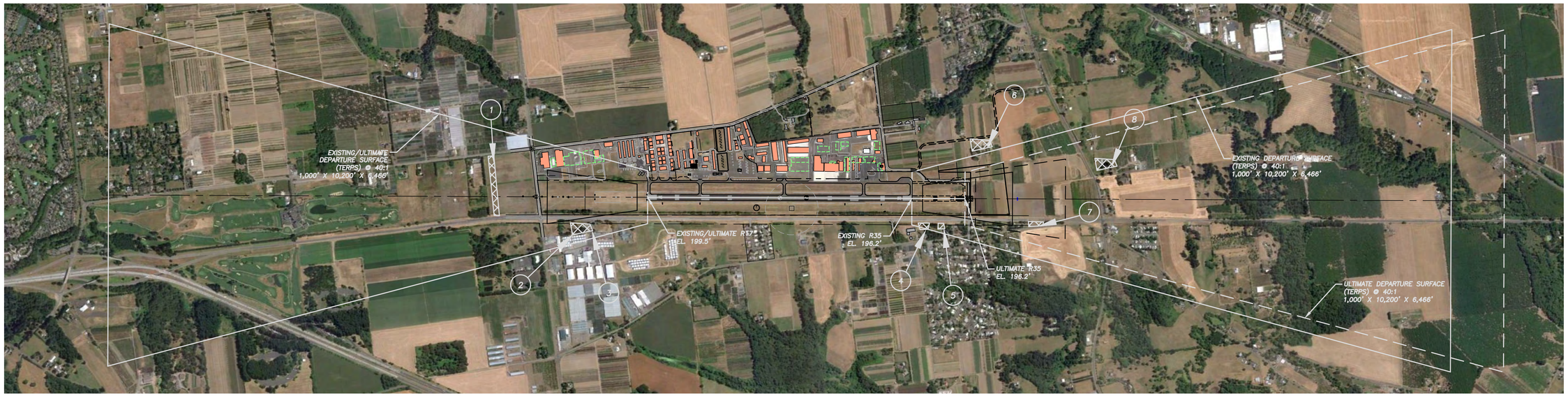
SHEET NUMBER
6
7 of 10

[DATE: 1/3/2013 10:22 AM] [AUTHOR: ----] [PLOTTER: DWG To PDF.pc3] [STYLE: WHP-Standard.ctb]
[PATH: P:\Oregon Department of Aviation\034317\Design\Drawings\Civil\034317-AIRP-LU01.dwg] [LAYOUT: Layout1]

XREF INDEX:



NO. ⓧ	ITEM	PART 77 SURFACE	FUTURE PART 77 SURFACE	ELEV	OFFSET FROM RWY CL	DISTANCE FROM RWY END	ESTIMATED AMOUNT OF PENETRATION	AIRPORT PROPERTY	DISPOSITION
1	TREE GROUP	APPROACH (RWY 17)	SAME	269'	0 R	3028'	(–2)	NO	CLEAR TREES
2	W. END TREE LINE	NONE	APPROACH (RWY 17)	303'	491' R	1590'	67'	NO	CLEAR TREES
3	E. END TREE LINE	NONE	APPROACH (RWY 17)	294'	491' R	715'	80'	NO	CLEAR TREES
4	TREE GROUP	TRANSITIONAL (RWY 35)	APPROACH (RWY 35)	248'	453' L	270'	51'	NO	CLEAR TREES
5	TREE GROUP	TRANSITIONAL (RWY 35)	APPROACH (RWY 35)	268'	460' L	435'	68'	NO	CLEAR TREES
6	TREE GROUP	TRANSITIONAL (RWY 35)	TRANSITIONAL (RWY 35)	276'	940' R	2060'	30'	NO	CLEAR TREES
7	TREE GROUP	TRANSITIONAL (RWY 17)	APPROACH (RWY 35)	282'	423' L	2540'	20'	NO	CLEAR TREES
8	TREE GROUP	APPROACH (RWY 35)	APPROACH (RWY 35)	286'	557' R	3760'	(–2')	NO	CLEAR TREES



NOTE: NO OBSTRUCTIONS EXIST WITHIN THE AIRPORT'S TERPS SURFACES.

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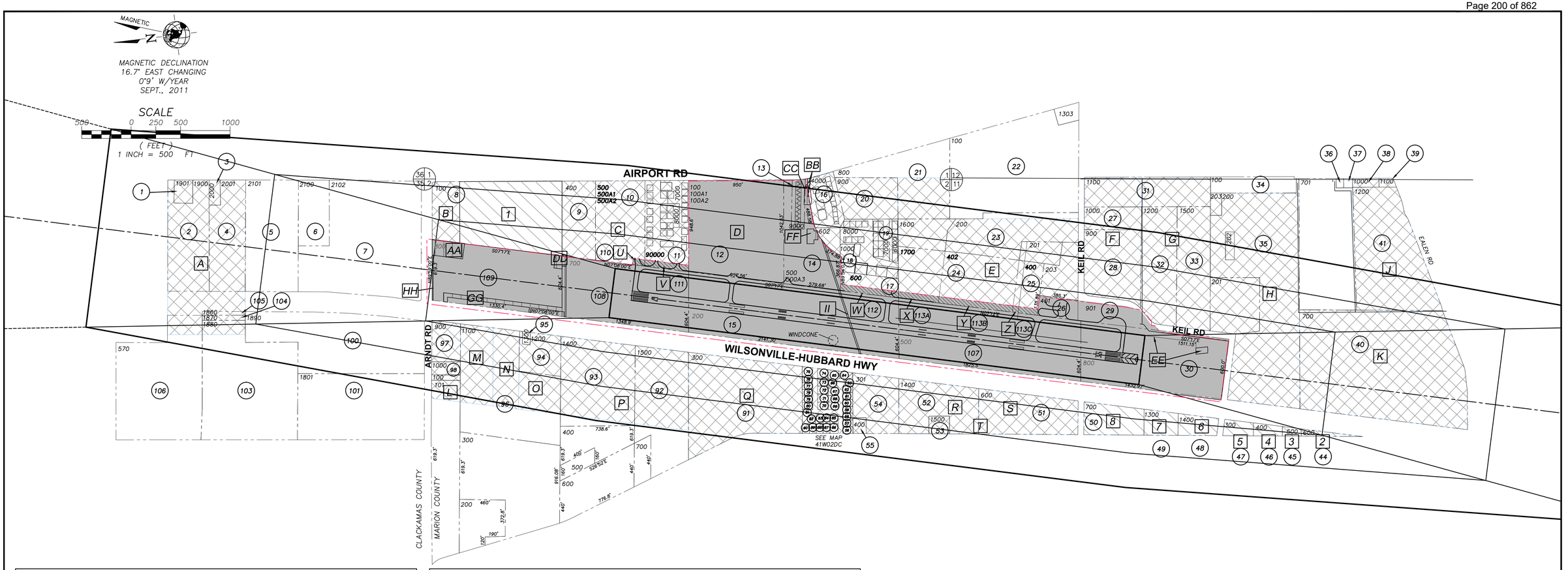
RUNWAY DEPARTURE SURFACES DRAWING

OREGON DEPARTMENT OF AVIATION
AURORA STATE AIRPORT ~ MASTER PLAN UPDATE

PROJECT NUMBER	DRAWING FILE NAME	SCALE
034317	034317-AIRP-DS01	1"=1,000'

SHEET NUMBER
7
8 of 10

[DATE: 1/3/2013 10:28 AM] [AUTHOR: riwosaki] [PLOTTER: DWG To PDF.pc3] [STYLE: WHP–Standard.ctb]
[PATH: P:\Oregon Department of Aviation\034317\Design\Drawings\Civil\034317–AIRP–DS01.dwg] [LAYOUT: Layout1]



PROPERTY ACQUIRED UNDER FEDERAL AID PROJECTS

AREA	DATE	RECORDING INFORMATION	INTEREST ACQUIRED	EASEMENT TYPE	PREVIOUS OWNER	LAND AQUISITION
A *	03-20-43	4715A, BOOK 312 PAGE 697	EASEMENT	AVIGATION	CHARLES & LILA WALTER	ADAP 3-41-0056-01
B *	12-30-42	3221B, BOOK 279, PAGE 49	EASEMENT	AVIGATION	LEWIS & BERTHA KEIL	ADAP 3-41-0056-01
C *	04-19-43	3222B, BOOK 282 PAGE 662	EASEMENT	AVIGATION	WILLIAM & MANDY JESKY	ADAP 3-41-0056-01
D	1-18-43	BOOK 279, PAGE 530	FEE	OWNERSHIP	OTTO & MATILDA KNORR	ADAP 3-41-0056-01
E *	12-31-42	3216B, BOOK 279, PAGE 84	EASEMENT	AVIGATION	MILDRED STEINHOFF	ADAP 3-41-0056-01
F *	01-30-43	10619A, BOOK 280, PAGE 26	EASEMENT	AVIGATION	KENNETH & BERTHA BROWN	ADAP 3-41-0056-01
G *	01-19-43	10620A, BOOK 279, PAGE 365	EASEMENT	AVIGATION	IRVIN & MARLEA LEFFLER	ADAP 3-41-0056-01
H *	12-30-42	3213B, BOOK 279, PAGE 43	EASEMENT	AVIGATION	IRVIN & MARLEA LEFFLER	ADAP 3-41-0056-01
J *	12-31-42	10644, BOOK 279, PAGE 88	EASEMENT	AVIGATION	IRVIN & MARLEA LEFFLER	ADAP 3-41-0056-01
K *	12-30-42	3212A, BOOK 279, PAGE 46	EASEMENT	AVIGATION	IRVIN & MARLEA LEFFLER	ADAP 3-41-0056-01
L *	12-30-42	3221B, BOOK 279, PAGE 49	EASEMENT	AVIGATION	LEWIS & BERTHA KEIL	ADAP 3-41-0056-01
M *	01-09-43	3219B, BOOK 279, PAGE 359	EASEMENT	AVIGATION	DAVID KEIL	ADAP 3-41-0056-01
N *	01-09-43	3220B, BOOK 279, PAGE 362	EASEMENT	AVIGATION	HENRY & SOFIA KEIL	ADAP 3-41-0056-01

*INFORMATION FROM DEVCO ENGINEERING FUNDED BY A.I.P. NO. 3-41-004-03 AND APPROVED 5/11/1996

PROPERTY ACQUIRED UNDER FEDERAL AID PROJECTS

AREA	DATE	RECORDING INFORMATION	INTEREST ACQUIRED	EASEMENT TYPE	PREVIOUS OWNER	LAND AQUISITION
O *	04-02-43	3218B, BOOK 282, PAGE 121	EASEMENT	AVIGATION	WILLIAM & EDNA KEIL	ADAP 3-41-0056-01
P *	04-19-43	3222B, BOOK 282, PAGE 662	EASEMENT	AVIGATION	WILLIAM & MANDY JESKY	ADAP 3-41-0056-01
Q *	12-31-42	3217B, BOOK 279, PAGE 91	EASEMENT	AVIGATION	OTTO & MATILDA KNORR	ADAP 3-41-0056-01
R *	03-01-43	10734, BOOK 1089, PAGE 188	EASEMENT	AVIGATION	IRVIN & MARLEA LEFFLER	ADAP 3-41-0056-01
S *	12-05-42	10735, BOOK 1184, PAGE 694	EASEMENT	AVIGATION	IRVIN & MARLEA LEFFLER	ADAP 3-41-0056-01
T *	12-31-42	3216B, BOOK 279, PAGE 84	EASEMENT	AVIGATION	MILDRED STEINHOFF	ADAP 3-41-0056-01
U (110)	08-14-07	REEL 2857, PAGE 98	FEE	OWNERSHIP	TRI-PROP LLC	A.I.P. 3-41-0004-12
V (111)	08-13-07	REEL 2857, PAGE 77	FEE	OWNERSHIP	LLOYD B JANZEN/ JOHN WESSMAN	A.I.P. 3-41-0004-12
W (112)	08-13-07	REEL 2857, PAGE 416	FEE	OWNERSHIP	VERA L BENNETT	A.I.P. 3-41-0004-12
X (113A)	08-27-07	REEL 2859, PAGE 302	FEE	OWNERSHIP	TLM HOLDINGS, LLC	A.I.P. 3-41-0004-12
Y (113B)	08-27-07	REEL 2859, PAGE 302	FEE	OWNERSHIP	TLM HOLDINGS, LLC	A.I.P. 3-41-0004-12
Z (113C)	08-27-07	REEL 2859, PAGE 302	FEE	OWNERSHIP	TLM HOLDINGS, LLC	A.I.P. 3-41-0004-12
(26) a	1993		FEE	OWNERSHIP	STATE OF OREGON DOT	A.I.P. 3-41-0004-003
(29) b	1993		FEE	OWNERSHIP	STATE OF OREGON DOT	A.I.P. 3-41-0004-003
(14) c	1985		FEE	OWNERSHIP	STATE OF OREGON DOT	A.I.P. 3-41-0004-001

a GRANT PARCEL A b GRANT PARCEL B c GRANT PARCEL C

EASEMENTS TO BE ACQUIRED

AREA	CURRENT OWNERSHIP	APPROXIMATE AREA
1	COLUMBIA HELICOPTERS, INC. P.O. BOX 3500 PORTLAND, OR 97208	16.32 A
2	THOMA AND JO ETTA SCHOMUS 21810 BOONES FERRY RD, NE AURORA, OR 97002	0.60 A
3	DAN AND JANET ANDERSON 15260 SE MINERVA MILWAUKIE, OR 97267	0.52 A
4	GARY AND KATHRYN HAMLET 21860 BOONES FERRY RD, NE AURORA, OR 97002	1.00 A
5	GENE AND DIANA BRUNO P.O. BOX 8 AURORA, OR 97002	1.05 A
6	HERMAN AND GRACE MCCUNE TIMOTHY AND EVELYN HOWLAND 22050 BOONES FERRY RD, NE AURORA, OR 97002	1.92 A
7	NORMAN AND BETTY MENNICK 22090 BOONES FERRY RD, NE AURORA, OR 97002	2.00 A
8	LYLE AND VICKI HAWORTH 22190 BOONES FERRY RD, NE AURORA, OR 97002	5.03 A

	LEGEND
DESCRIPTION	EXISTING
EXISTING FEE OWNERSHIP	X
EXISTING AVIGATION EASEMENT	A
EASEMENT TO BE AQUIRED	1
PROPERTY AQUIRED UNDER AIP 12	
PARCEL OWNERSHIP IDENTIFICATION NUMBER	(72)
TAX LOT NUMBER	1800
EXISTING STATE OF OREGON DEPARTMENT OF TRANSPORTATION, DIVISION OF AERONAUTICS PROPERTY OWNERSHIP LINE	
PARCEL BOUNDARY	
RUNWAY PROTECTION ZONE	

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NO.	BY	DATE	REMARKS

EXHIBIT 'A' ~ PROPERTY MAP

OREGON DEPARTMENT OF AVIATION
AURORA STATE AIRPORT ~ MASTER PLAN UPDATE

PROJECT NUMBER	DRAWING FILE NAME	SCALE
034317	32690-AIRP-EXHIBITA	CUSTOM

SHEET NUMBER 8

[DATE: 1/3/2013 10:30 AM] [AUTHOR: ------] [PLOTTER: DWG To PDF.pc3] [STYLE: WHP-Standard.ctb]
[PATH: P:\Oregon Department of Aviation\034317\Design\Drawings\Civil\32690-airp-ExhibitA.dwg] [LAYOUT: Exhibit A]

PARCEL OWNERSHIP DATA

PARCEL NO.	ACRES	OWNER	RECORDING INFORMATION	COUNTY	MAP AND TAX LOT NUMBERS
1	1.01 A	KEITH G. & DORIS A. BORGEN 23971 NE AIRPORT RD. AURORA, OR 97002	BK. 76, PG. 34755	CLACKAMAS	MAP 3-1W-45 T.L. #1901
2	9.52 A	STANLEY V. &, BRADLEY C. SHEPARD 23150 NE BOONES FERRY RD. AURORA, OR 97002	BK. 88, PG. 00802	CLACKAMAS	MAP 3-1W-35 T.L. #1900
3	0.64 A	ROGER K. INGALLS 23901 AIRPORT RD. AURORA, OR 97002	BK. 84 PG. 13047	CLACKAMAS	MAP 3-1W-35 T.L. #2000
4	9.52 A	BRADLEY C. & STANLEY V. SHEPARD 23150 NE BOONES FERRY RD. AURORA, OR 97002	BK. 87, PG. 43761	CLACKAMAS	MAP 3-1W-35 T.L. #2001
5	13.2 A	BRADLEY C. & STANLEY V. SHEPARD 23150 NE BOONES FERRY RD. AURORA, OR 97002	BK. 87, PG. 43761	CLACKAMAS	MAP 3-1W-351 T.L. #2101
6	8.62 A	EDSAL A. & ARLENE G. WOOD 10505 SW HAWTHORNE LN. PORTLAND, OR 97225	BK. 94, PG. 78194	CLACKAMAS	MAP 3-1W-35 T.L. #2100
7	23.96 A	BRADLEY C. & STANLEY V. SHEPARD 23150 NE BOONES FERRY RD. AURORA, OR 97002	BK. 87, PG. 43761	CLACKAMAS	MAP 3-1W-35 T.L. #2102
8	19.24 A	COLUMBIA HELICOPTERS, INC. P.O. BOX 3500 PORTLAND, OR 97208	BK. 957, PG. 269	MARION	MAP 4-1W-02D T.L. #100
9	6.47 A	MARLOWE C. TREIT 23123 AIRPORT RD, NE AURORA, OR 97002	BK. 717, PG. 31	MARION	MAP 4-1W-02D T.L. #400
10	9.94 A	MARLOWE C. TREIT 23123 AIRPORT RD, NE AURORA, OR 97002	BK. 717, PG. 31	MARION	MAP 4-1W-02D T.L. #500
11	9.03 A	JOHN D. WESSMAN & LLOYD B. JANZEN DBA LEASON ENTERPRISES 1555 S. PALM CANYON DR. #G-106 PALM SPRINGS, CA. 92262	BK. 1159, PG. 387	MARION	MAP 4-1W-02D T.L. #600
12	21.42 A	OREGON DEPARTMENT OF TRANSPORTATION AERONAUTICS DIVISION, FAPS-41-004-01 3040 25TH ST. SE SALEM, OR 97310	BK. 112, PG. 1040	MARION	MAP 4-1W-02D T.L. #100
13	N/A	SEE DETAILED LIST	VARIES – SEE DETAILED LIST	MARION	MAP 4-1W-02D T.L. #9000 TO #90021
14	10.00 A	OREGON DEPARTMENT OF TRANSPORTATION AERONAUTICS DIVISION, FAPS-41-004-01 3040 25TH ST. SE SALEM, OR 97310	BK. 458, PG. 411	MARION	MAP 4-1W-02D T.L. #500
15	29.49 A	OREGON DEPARTMENT OF TRANSPORTATION AERONAUTICS DIVISION 3040 25TH ST. SE SALEM, OR 97310	BK. 747, PG. 568	MARION	MAP 4-1W-02D T.L. #200
16	1.00 A	ROGER M. STENBOCK P.O. BOX 356 AURORA, OR 97002	BK. 1048, PG. 496	MARION	MAP 4-1W-02D SUPP. MAP 1 T.L. #601
17	7.22 A	VERA L. BENNETT 15111 NE MULTNOMAH PORTLAND, OR 97230	BK. 1041, PG. 278	MARION	MAP 4-1W-02D SUPP. MAP 1 T.L. #600
18	1.90 A	VERA L. BENNETT 15111 NE MULTNOMAH PORTLAND, OR 97230	BK. 1041, PG. 278	MARION	MAP 4-1W-02D SUPP. MAP 1 T.L. #1000
19	5.00 A	VERA L. BENNETT 15111 NE MULTNOMAH PORTLAND, OR 97230	BK. 1041, PG. 278	MARION	MAP 4-1W-02D T.L. #1100
20	5.12 A	BEYONE THE REED THEOLOGICAL CENTER RALPH JONES 9231 2ND AVE. NW SEATTLE, WA 98107	BK. 89, PG. 345	MARION	MAP 4-1W-02D T.L. #900
21	11.42 A	BEYONE THE REED THEOLOGICAL CENTER RALPH JONES 9231 2ND AVE, NW SEATTLE, WA 98107	BK. 89, PG. 345	MARION	MAP 4-1W-02D T.L. #800
22	12.62 A	GERALD W. & KATHRYN L. JESKEY FLORENCE SEXTON, SEXTON/NETTER 1054 NW 8TH WAY	BK. 273, PG. 1172	MARION	MAP 4-1W-11A T.L. #100
23	25.94 A	NORTHWEST AIRMOTIVE P.O. BOX 23926 TIGARD, OR 97281	BK. 1076, PG. 26	MARION	MAP 4-1W-11A T.L. #200
24	4.64 A	GEORGE JACOBSEN 845 NE COLUMBIA BLVD. PORTLAND, OR 97211	BK. 1003 PG. 354	MARION	MAP 4-1W-11A T.L. #300
25	6.63 A	GEORGE JACOBSEN 845 NE COLUMBIA BLVD. PORTLAND, OR 97211	BK. E0868, PG. 298	MARION	MAP 4-1W-11A T.L. #400
26	1.82 A	STATE OF OR D.O.T. AERONAUTICS DIVISION 417 TRANSPORTATION BLDG. SALEM, OR 97310	BK. 868, PG. 298	MARION	MAP 4-1W-11A T.L. #401
27	3.07 A	SMALL BUSINESS ADMINISTRATION AUDREY L. SKINNER P.O. BOX 421 AURORA, OR 97002	BK. 94C3, PG. 4520CCJ	MARION	MAP 4-1W-11A T.L. #1000
28	12.09 A	DUWAYNE & LORAINE DONNELY TRUST P.O. BOX 389 AURORA, OR 97002	BK. E1193, PG. 750	MARION	MAP 4-1W-11A T.L. #900
29	X.XX A	STATE OF OR D.O.T. AERONAUTICS DIVISION 417 TRANSPORTATION BLDG. SALEM, OR 97310	BK. 1193, PG. 750	MARION	MAP 4-1W-11A T.L. #901
30	17.79 A	STATE OF OR D.O.T. AERONAUTICS DIVISION 417 TRANSPORTATION BLDG. SALEM, OR 97310	BK. 747, PG. 568	MARION	MAP 4-1W-11A1 T.L. #800
31	8.86 A	OTTO HORVATH P.O. BOX 98 AURORA, OR 97002	BK. 108, PG. 1251	MARION	MAP 4-1W-11A T.L. #1100
32	9.86 A	DUWAYNE & LORAINE DONNELY TRUST P.O. BOX 389 AURORA, OR 97002	BK. 1126, PG. 200	MARION	MAP 4-1W-11A T.L. #1200
33	9.91 A	DUWAYNE & LORAINE DONNELY TRUST P.O. BOX 389 AURORA, OR 97002	BK. 1126, PG. 200	MARION	MAP 4-1W-11A T.L. #1500
34	3.01 A	VERNON & VETA M. SCOTT 21900 COLE AVE, NE AURORA, OR 97002	BK. 1168, PG. 270	MARION	MAP 4-1W-11D T.L. #100
35	40.13 A	RICHARD P. & JOCELYN B. JENKS 14188 KEIL RD, NE AURORA, OR 97002	BK. 0001, PG. 918	MARION	MAP 4-1W-11D T.L. #200
36	0.16 A	HAROLD J. & MARY E. WHITTLE 21851 COLE LANE, NE AURORA, OR 97002	BK. 449, PG. 488	MARION	MAP 4-1W-11D T.L. #800

PARCEL OWNERSHIP DATA

PARCEL NO.	ACRES	OWNER	RECORDING INFORMATION	COUNTY	MAP AND TAX LOT NUMBERS
37	798 SQ. FT.	JOSHUA B. & JAIME M. THORESON 21841 NE COLE LN AURORA, OR 97002	BK. 1206, PG. 416	MARION	MAP 4-1W-11D T.L. #900
38	1470 SQ. Ft.	HANS A. HENDGEN 15243 NE COUNTRYSIDE DR. AURORA, OR 97002	BK. 1207, PG. 515	MARION	MAP 4-1W-11D T.L. #1000
39	0.28 A	ROBERT E. & MARY LOU RIGDON 21811 COLE LN, NE AURORA, OR 97002	BK. E0671, PG. 207	MARION	MAP 4-1W-11D T.L. #1100
40	57.98 A	HEDWG PARDEY 20186 GRIM RD NE AURORA, OR 97002	BK. 747, PG. 568	MARION	MAP 4-1W-11D T.L. #700
41	19.41 A	PHIL GOLDSMITH 1100 SW 6TH AVE. #1212 PORTLAND, OR 97204	BK. 1099, PG. 236	MARION	MAP 4-1W-11D T.L. #1200
44	0.60 A	THOMAS C. & JO ETTA P. SCHOMUS 21810 BOONES FERRY RD. NE AURORA, OR 97002	BK. 1085, PG. 180	MARION	MAP 4-1W-11D T.L. #600
45	0.52 A	DAN E. & JANET K. ANDERSON 15260 SE MNERVA MILWAUKIE, OR 97267	BK. 419, PG. 83	MARION	MAP 4-1W-11D T.L. #500
46	1.00 A	GARY J. & KATHRYN K. HAMLET 21860 BOONES FERRY RD. NE AURORA, OR 97002	BK. 473, PG. 173	MARION	MAP 4-1W-11D T.L. #400
47	1.05 A	GENE C. & DIANA BRUNO P.O. BOX 8 AURORA, OR 97002	BK. 762, PG. 96	MARION	MAP 4-1W-11D T.L. #300
48	1.92 A	HERMAN W. & GRACE J. MCCUNE TIMOTHY & EVELYN HOWLAND 22050 BOONES FERRY RD. NE AURORA, OR 97002	BK. 572, PG. 137	MARION	MAP 4-1W-11A T.L. #1400
49	2.00 A	NORMAN & BETTY MENNICK 22090 BOONES FERRY RD. SE AURORA, OR 97002	BK. 423, PG. 361	MARION	MAP 4-1W-11A T.L. #1300
50	5.03 A	LYLE G. & VICKI L. HAWORTH 22190 BOONES FERRY RD. NE AURORA, OR 97002	BK. 921, PG. 218	MARION	MAP 4-1W-11A T.L. #700
51	10.02 A	ELIZABETH KEIL TRUST 22430 BOONES FERRY RD, NE AURORA, OR 97002	BK. 1184, PG. 694	MARION	MAP 4-1W-1A T.L. #600
52	9.50 A	ROBER H. KEIL P.O. BOX 15 AURORA, OR 97002	BK. 1089, PG. 188	MARION	MAP 4-1W-02D T.L. #1400
53	1.00 A	S. DUANE & CHERYL J. KENNEY 22510 BOONES FERRY RD, NE AURORA, OR 97002	BK. 0001, PG. 1625	MARION	MAP 4-1W-02D SUPP. MAP 1 T.L. #90011
54	5.95 A	FRED R. & EVELYN R. KAHLE 22730 BOONES FERRY RD, NE AURORA, OR 97002	BK. E0024, PG. 782	MARION	MAP 4-1W-02D T.L. #301
55	0.59 A	JOSHEPH J. NEUVILLE 10955 SE 25TH AVE MILWAUKIE, OR 97222	BK. 352, PG. 1782	MARION	MAP 4-1W-02D T.L. #400
56	SOUTH HAVEN LT.1 BK.1 SOUTH	SHIRLEE KOWASH 14010 CESNA ST, NE AURORA, OR 97002	BK. 648, PG. 113	MARION	MAP 4-1W-02DC T.L. #3600
57	SOUTH HAVEN LT.1 BK.1 SOUTH	ROBERT R. & JOANNE M. CAPP 14020 CESSNA ST, NE AURORA, OR 97002	BK. 347, PG. 70	MARION	MAP 4-1W-02DC T.L. #3500
58	SOUTH HAVEN LT.3 BK.1 SOUTH	VINCENT L. & DINA C. SPRINGER 14030 CESSNA ST, NE AURORA, OR 97002	BK. 210, PG. 908	MARION	MAP 4-1W-02DC T.L. #3400
59	SOUTH HAVEN LT.4 BK.1 SOUTH	VERYLN R. & GERALDINE PIGMAN 14050 CESSNA ST, NE AURORA, OR 97002	BK. 817, PG. 296	MARION	MAP 4-1W-02DC T.L. #3300
60	SOUTH HAVEN LT.5 BK.1 SOUTH	ELIAS & PERAL DUTTON 14070 CESSNA ST, NE AURORA, OR 97002	BK. 1052, PG. 486	MARION	MAP 4-1W-02DC T.L. #3200
61	SOUTH HAVEN LT.6 BK.1 SOUTH	STEVEN M. REED 14080 CESSNA ST, NE AURORA, OR 97002	BK. 975 PG. 268	MARION	MAP 4-1W-02DC T.L. #3100
62	SOUTH HAVEN LT.7 BK.1 SOUTH	DELORES S. JONES 14090 CESSNA ST, NE AURORA, OR 97002	BK. 336, PG. 759	MARION	MAP 4-1W-02DC T.L. #3000
63	SOUTH HAVEN LT.8 BK.1 SOUTH	DAVID A. & MARJORIE GARVIN 14100 CESSNA ST, NE AURORA, OR 97002	BK. 205, PG. 477	MARION	MAP 4-1W-02DC T.L. #2900
64	SOUTH HAVEN LT.9 BK.1 SOUTH	CLARA HELMER 14110 CESSNA ST, NE AURORA, OR 97002	BK. 31, PG. 960	MARION	MAP 4-1W-02DC T.L. #2800
65	SOUTH HAVEN LT.10 BK.1 SOUTH	DORETTA WALKER 14111 CESSNA ST, NE AURORA, OR 97002	BK. 542, PG. 15	MARION	MAP 4-1W-02DC T.L. #2700
66	SOUTH HAVEN LT.11 BK.1 SOUTH	LEONA I. WEICKER 14101 CESSNA ST, NE AURORA, OR 97002	BK. 79, PG. 392	MARION	MAP 4-1W-02DC T.L. #2400
67	SOUTH HAVEN LT.12 BK.1 SOUTH	GAYLE L. & MARLENE S. KIRKPATRICK 14091 CESSNA ST, NE AURORA, OR 97002	BK. 319, PG. 1006	MARION	MAP 4-1W-02DC T.L. #2200
68	SOUTH HAVEN LT.13 BK.1 SOUTH	CARL ANDERSON, VINCENT ROBERTS, ET. AL 14081 CESSNA ST, NE AURORA, OR 97002	BK. 688, PG. 1025	MARION	MAP 4-1W-02DC T.L. #1900
69	SOUTH HAVEN LT.14 BK.1 SOUTH	MARVIN K. & MERRY JANE BOYLAN 14071 CESSNA ST, NE AURORA, OR 97002	BK. 144, PG. 1025	MARION	MAP 4-1W-02DC T.L. #1800
70	SOUTH HAVEN LT.15 BK.1 SOUTH	VERNE C. & EDNA F. POWELL 14072 PIPER ST, NE AURORA, OR 97002	BK. 396, PG. 440	MARION	MAP 4-1W-02DC T.L. #1700
71	SOUTH HAVEN LT.16 BK.1 SOUTH	FIRST INTERSTATE BANK OF OR P.O. BOX 2971 PORTLAND, OR 97028	BK. 578, PG. 311	MARION	MAP 4-1W-02DC T.L. #2000
72	SOUTH HAVEN LT.17 BK.1 SOUTH	ROBER STRAUGHAN IV GARY A. & PATRICIA L. HIGGINS 14092 PIPER ST, NE AURORA, OR 97002	BK. 857, PG. 227	MARION	MAP 4-1W-02DC T.L. #2100
73	SOUTH HAVEN LT.18 BK.1 SOUTH	WALTER C. & BERNICE C. BECKNER 14102 PIPER ST, NE AURORA, OR 97002	BK. 824, PG. 488	MARION	MAP 4-1W-02DC T.L. #2500
74	SOUTH HAVEN LT.19 BK.1 SOUTH	LELAN B. & VIOLET H. GEORGE 14112 PIPER ST, NE AURORA, OR 97002	BK. 778, PG. 58	MARION	MAP 4-1W-02DC T.L. #2600

PARCEL OWNERSHIP DATA

PARCEL NO.	ACRES	OWNER	RECORDING INFORMATION	COUNTY	MAP AND TAX LOT NUMBERS
75	SOUTH HAVEN LT.12 BK.2 SOUTH	SANDO M. SCOUTO ET. AL, 14113 NE PIPER AVE AURORA, OR 97002	BK. 1194, PG. 194	MARION	MAP 4-1W-02DC T.L. #100
76	SOUTH HAVEN LT.11 BK.2 SOUTH	MELVEN M. & LOIS A. NICHOLS 14105 PIPER ST, NE AURORA, OR 97002	BK. 1135, PG. 455	MARION	MAP 4-1W-02DC T.L. #1200
77	SOUTH HAVEN LT.14 BK.2 SOUTH	KENNETH A. & JOSEPHINE TUCKER 14093 PIPER ST, NE AURORA, OR 97002	BK. 678, PG. 276	MARION	MAP 4-1W-02DC T.L. #300
78	SOUTH HAVEN LT.13 BK.2 SOUTH	WILLIAM C. & LUCILE M. JOHNSON 14083 PIPER ST, NE AURORA, OR 979002	BK. 597, PG. 73	MARION	MAP 4-1W-02DC T.L. #400
79	SOUTH HAVEN LT.12 BK.2 SOUTH	BETTY R. & DON P. DIONISIO 14073 PIPER ST, NE AURORA, OR 97002	BK. 572, PG. 191	MARION	MAP 4-1W-02DC T.L. #500
80	SOUTH HAVEN LT.11 BK.2 SOUTH	RUSSELL R. & JUDITH A. KING 14063 PIPER ST, NE AURORA, OR 97002	BK. 306, PG. 853	MARION	MAP 4-1W-02DC T.L. #600
81	SOUTH HAVEN LT.10 BK.2 SOUTH	GREGORY A. BACON 10990 SW WILSONVILLE RD 86 WILSONVILLE, OR 97070	BK. 1199, PG. 199	MARION	MAP 4-1W-02DC T.L. #700
82	SOUTH HAVEN LT.9 BK.2 SOUTH	ROBERT & JOANN CAPP 22740 MOONEY AVE, NE AURORA, OR 97002	BK. 735, PG. 67	MARION	MAP 4-1W-02DC T.L. #800
83	SOUTH HAVEN LT.8 BK.2 SOUTH	LYLE & MARCELLA MOIR 22730 MOONEY ST, NE AURORA, OR 97002	BK. 111, PG. 968	MARION	MAP 4-1W-02DC T.L. #1600
84	SOUTH HAVEN LT.7 BK.2 SOUTH	DAVID & SHANNON E. GIBB 7187 S. SEVEN OAKS LN CANBY, OR 97013	BK. 1003 PG. 354	MARION	MAP 4-1W-02DC T.L. #1500
85	SOUTH HAVEN LT.6 BK.2 SOUTH	KENNETH J. & FLORENCE G. INMAN 14021 CESSNA ST, NE AURORA, OR 97002	BK. 692, PG. 801	MARION	MAP 4-1W-02D T.L. #1400
86	SOUTH HAVEN LT.5 BK.2 SOUTH	GORDON & DOROTHY LINDQUIST 14011 CESSNA ST, NE AURORA, OR 97002	BK. 797, PG. 224	MARION	MAP 4-1W-02D T.L. #1300
87	SOUTH HAVEN LT.4 BK.2 SOUTH	RONALD W. ROBINSON 22720 NE BOONES FERRY RD AURORA, OR 97002	BK. 280, PG. 158	MARION	MAP 4-1W-02DC T.L. #1200
88	SOUTH HAVEN LT.1 BK.2 SOUTH	FRED & EVELYN KAHLE 22730 BOONES FERRY RD AURORA, OR 97002	BK. 786, PG. 485	MARION	MAP 4-1W-02DC T.L. #1100
89	SOUTH HAVEN LT.2 BK.2 SOUTH	JOHN J. & ELVA G. MORRISON 22740 BOONES FERRY RD AURORA, OR 97002	BK. 703, PG. 263	MARION	MAP 4-1W-02DC T.L. #1000
90	SOUTH HAVEN LT.1 BK.2 SOUTH	REGINA W. MUTER 22720 BOONES FERRY RD, NE AURORA, OR 97002	BK. 1019, PG. 142	MARION	MAP 4-1W-02DC T.L. #900
91	22.33 A	FREDERICK & ROYLYNN KAHLE 22910 BOONES FERRY RD, NE AURORA, OR 97002	BK. 801, PG. 230	MARION	MAP 4-1W-02D T.L. #300
92	15.12 A	ELMER JESKEY, BRADLEY C. SHEPARD 23150 NE BOONES FERRY RD AURORA, OR 97002	BK. 347, PG. 272	CLACKAMAS	MAP 4-1W-02A T.L. #1500
93	15.00 A	FREEMAN LAND & CATTLE 2034 NW 27TH AVE PORTLAND, OR 97210	BK. 971, PG. 348	CLACKAMAS	MAP 4-1W-02A T.L. #1400
94	3.77 A	ANDERSON HAY & GRAIN CO., INC. P.O. BOX 99 ELLENSBURG, WA 98926	BK. 1212, PG. 41	CLACKAMAS	MAP 4-1W-02A T.L. #1200
95	0.23 A	ANDERSON HAY & GRAIN CO., INC. P.O. BOX 99 ELLENSBURG, WA 98926	BK. 1212, PG. 41	CLACKAMAS	MAP 4-1W-02A T.L. #1300
96	22.20 A	ANDERSON HAY & GRAIN CO., INC. P.O. BOX 99 ELLENSBURG, WA 98926	BK. 122, PG. 41	CLACKAMAS	MAP 4-1W-02A T.L. #1100
97	2.72 A	DELBERT C. HEWITT P.O. BOX 875 WILSONVILLE, OR 97070	BK. 108 PG. 1568	CLACKAMAS	MAP 4-1W-02D T.L. #900
98	0.89 A	DELBERT C. HEWITT 13793 EHLEN RD, NE AURORA, OR 97002	BK. 424 PG. 477	CLACKAMAS	MAP 4-1W-02D T.L. #1000
100	23.40 A	EARL & MARILYN R. STOLLER, TRUSTEES 23546 NE STOLLER RD AURORA, OR 97002	BK. 92 PG. 71175	CLACKAMAS	MAP 3-1W-35 T.L. #1890
103	25.0 A	EARL STOLLER CO., INC. EARL & MARLIYN STOLLER TRUSTEES 23546 NE STOLLER PL AURORA, OR 97002	BK. 92 PG. 71176	CLACKAMAS	MAP 3-1W-35 T.L. #1880
104	0.52 A	EARL STOLLER CO., INC. EARL & MARLIYN STOLLER TRUSTEES 23546 NE STOLLER PL AURORA, OR 97002	BK. 92 PG. 71176	CLACKAMAS	MAP 3-1W-35 T.L. #1870
105	0.51 A	MARLIYN R. STOLLER EARL STOLLER CO., INC. 23546 NE STOLLER PL AURORA, OR 97002	BK. 79 PG. 23243	CLACKAMAS	MAP 3-1W-35 T.L. #1860
106	22.0 A	EARL H. & MARLIYN R. STOLLER, TRUSTEES 23546 NE STOLLER PL AURORA, OR 97002	BK. 92 PG. 71175	CLACKAMAS	MAP 3-1W-35 T.L. #570
107	25.11 A	STATE OF OREGON DEPT. OF TRANS. OR STATE BOARD OF AERONAUTICS SALEM, OR	BK. 482 PG. 653	MARION	MAP 4-1W-011A T.L. #500
108	18.08 A	STATE OF OREGON DEPT. OF TRANS. OR STATE BOARD OF AERONAUTICS SALEM, OR	BK. 482 PG. 653	MARION	MAP 4-1W-02D T.L. #700
109	17.76 A	STATE OF OREGON DEPT. OF TRANS. OR STATE BOARD OF AERONAUTICS SALEM, OR	BK. 779, PG. 01	MARION	MAP 4-1W-02D T.L. #800
110	0.18 A	STATE OF OREGON DEPT. OF TRANS. OR STATE BOARD OF AERONAUTICS SALEM, OR	REEL 2857, PG. 98	MARION	MAP 4-1W-02A T.L. #501
111	0.67 A	STATE OF OREGON DEPT. OF TRANS. OR STATE BOARD OF AERONAUTICS SALEM, OR	REEL 2857, PG. 77	MARION	MAP 4-1W-02A T.L. #90016
112	0.89 A	STATE OF OREGON DEPT. OF TRANS. OR STATE BOARD OF AERONAUTICS SALEM, OR	REEL 2857, PG. 416	MARION	MAP 4-1W-02D T.L. #604
113A	0.62 A	STATE OF OREGON DEPT. OF TRANS. OR STATE BOARD OF AERONAUTICS SALEM, OR	REEL 2859, PG. 302	MARION	MAP 4-1W-02D T.L. #1701

PARCEL OWNERSHIP DATA

PARCEL NO.	ACRES	OWNER	RECORDING INFORMATION	COUNTY	MAP AND TAX LOT NUMBERS
113B	1.12 A	STATE OF OREGON DEPT. OF TRANS. OR STATE BOARD OF AERONAUTICS SALEM, OR	REEL 2859, PG. 302	MARION	MAP 4-1W-11A T.L. #404
113C	0.39 A	STATE OF OREGON DEPT. OF TRANS. OR STATE BOARD OF AERONAUTICS SALEM, OR	REEL 2859, PG. 302	MARION	MAP 4-1W-11A T.L. #403
13A	XX S.F.	OREGON DEPARTMENT OF TRANSPORTATION DIVISION OF AERONAUTICS SALEM, OR	BK. 458, PG. 411	MARION	MAP 4-1W-02D SUPP. MAP 1 T.L. #90000
13B	XX S.F.	OREGON DEPARTMENT OF TRANSPORTATION DIVISION OF AERONAUTICS SALEM, OR	BK. 1009, PG. 43	MARION	MAP 4-1W-02D SUPP. MAP 1 T.L. #90001
13C	XX S.F.	OREGON DEPARTMENT OF TRANSPORTATION DIVISION OF AERONAUTICS SALEM, OR	BK. 1009, PG. 42	MARION	MAP 4-1W-02D SUPP. MAP 1 T.L. #90002
13D	XX S.F.	OREGON DEPARTMENT OF TRANSPORTATION DIVISION OF AERONAUTICS SALEM, OR	BK. 1009, PG. 42	MARION	MAP 4-1W-02D SUPP. MAP 1 T.L. #90003
13E	XX S.F.	OREGON DEPARTMENT OF TRANSPORTATION DIVISION OF AERONAUTICS SALEM, OR	BK. 1009, PG. 49	MARION	MAP 4-1W-02D SUPP. MAP 1 T.L. #90004
13F	XX S.F.	OREGON DEPARTMENT OF TRANSPORTATION DIVISION OF AERONAUTICS SALEM, OR	BK. 1009, PG. 46	MARION	MAP 4-1W-02 DIVISION OF AERONAUTICS SUPP. MAP 1 T.L. #90005
13G	XX S.F.	OREGON DEPARTMENT OF TRANSPORTATION DIVISION OF AERONAUTICS SALEM, OR	BK. 1009, PG. 46	MARION	MAP 4-1W-02D SUPP. MAP 1 T.L. #90006
13H	XX S.F.	OREGON DEPARTMENT OF TRANSPORTATION DIVISION OF AERONAUTICS SALEM, OR	BK. 1009, PG. 50	MARION	MAP 4-1W-02D SUPP. MAP 1 T.L. #90007
13J	XX S.F.	OREGON DEPARTMENT OF TRANSPORTATION DIVISION OF AERONAUTICS SALEM, OR	BK. 1009, PG. 49	MARION	MAP 4-1W-02D SUPP. MAP 1 T.L. #90008
13K	XX S.F.	OREGON DEPARTMENT OF TRANSPORTATION DIVISION OF AERONAUTICS SALEM, OR	BK. 1016, PG. 126	MARION	MAP 4-1W-02D SUPP. MAP 1 T.L. #90009
13L	XX S.F.	OREGON DEPARTMENT OF TRANSPORTATION DIVISION OF AERONAUTICS SALEM, OR	BK. 1009, PG. 51	MARION	MAP 4-1W-02D SUPP. MAP 1 T.L. #90010
13M	XX S.F.	OREGON DEPARTMENT OF TRANSPORTATION DIVISION OF AERONAUTICS SALEM, OR	BK. 1150, PG. 120	MARION	MAP 4-1W-02D SUPP. MAP 1 T.L. #90011
13N	XX S.F.	OREGON DEPARTMENT OF TRANSPORTATION DIVISION OF AERONAUTICS SALEM, OR	BK. 1009, PG. 44	MARION	MAP 4-1W-02D SUPP. MAP 1 T.L. #9012
13P	XX S.F.	OREGON DEPARTMENT OF TRANSPORTATION DIVISION OF AERONAUTICS SALEM, OR	BK. 1009, PG. 45	MARION	MAP 4-1W-02D SUPP. MAP 1 T.L. #90013
13Q	XX S.F.	OREGON DEPARTMENT OF TRANSPORTATION DIVISION OF AERONAUTICS SALEM, OR	BK. 1009, PG. 41	MARION	MAP 4-1W-02D SUPP. MAP 1 T.L. #90014
13R	XX S.F.	OREGON DEPARTMENT OF TRANSPORTATION DIVISION OF AERONAUTICS SALEM, OR	BK. 1009, PG. 53	MARION	MAP 4-1W-02D SUPP. MAP 1 T.L. #90015
13S	XX S.F.	OREGON DEPARTMENT OF TRANSPORTATION DIVISION OF AERONAUTICS SALEM, OR	BK. 1150, PG. 119	MARION	MAP 4-1W-02D SUPP. MAP 1 T.L. #90016
13T	XX S.F.	OREGON DEPARTMENT OF TRANSPORTATION DIVISION OF AERONAUTICS SALEM, OR	BK. 1009, PG. 51	CLACKAMAS	MAP 4-1W-02D SUPP. MAP 1 T.L. #90017
13U	XX S.F.	OREGON DEPARTMENT OF TRANSPORTATION DIVISION OF AERONAUTICS SALEM, OR	BK. 1016, PG. 126	CLACKAMAS	MAP 4-1W-02D SUPP. MAP 1 T.L. #90018
13V	XX S.F.	OREGON DEPARTMENT OF TRANSPORTATION DIVISION OF AERONAUTICS SALEM, OR	BK. 1069, PG. 381	CLACKAMAS	MAP 4-1W-02D SUPP. MAP 1 T.L. #90019
13W	XX S.F.	OREGON DEPARTMENT OF TRANSPORTATION DIVISION OF AERONAUTICS SALEM, OR	BK. 1168, PG. 644	CLACKAMAS	MAP 4-1W-02D SUPP. MAP 1 T.L. #90020
13X	XX S.F.	OREGON DEPARTMENT OF TRANSPORTATION DIVISION OF AERONAUTICS SALEM, OR	BK. 1168, PG. 644	CLACKAMAS	MAP 4-1W-02D SUPP. MAP 1 T.L. #90021

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OREGON DEPARTMENT OF AVIATION

THE PREPARATION OF THIS DOCUMENT MAY HAVE BEEN SUPPORTED, IN PART, THROUGH THE AIRPORT IMPROVEMENT PROGRAM FINANCIAL ASSISTANCE FROM THE FEDERAL AVIATION ADMINISTRATION (PROJECT NUMBER 3-41-0004-015) AS PROVIDED UNDER TITLE 49, UNITED STATES CODE, SECTION 47104. THE CONTENTS DO NOT NECESSARILY REFLECT THE OFFICIAL VIEWS OR POLICY OF THE FAA. ACCEPTANCE OF THIS REPORT BY THE FAA DOES NOT IN ANY WAY CONSTITUTE A COMMITMENT ON THE PART OF THE UNITED STATES TO PARTICIPATE IN ANY DEVELOPMENT DEPICTED THEREIN NOR DOES IT INDICATE THAT THE PROPOSED DEVELOPMENT IS ENVIRONMENTALLY ACCEPTABLE IN ACCORDANCE WITH APPROPRIATE PUBLIC LAWS.

SHEET INFO	
DESIGNED	SML
DRAWN	RAI
CHECKED	REA
APPROVED

Chapter Seven: CAPITAL IMPROVEMENT PLAN

Airport Master Plan Update

Aurora State Airport

Through the evaluation of the facility requirements, identification of the Preferred Alternative, and the development of the Airport Layout Plan, the improvements needed at the Aurora State Airport over the next 20-year period have been determined. The Capital Improvement Plan (CIP) provides the basis for planning the funding of these improvements. The planned phases of development are in the 5-, 10- and 20-year time frames.

Additionally, this chapter presents a financial implementation analysis for Aurora State Airport and examines various facets of the financial operating condition of the Airport.

CAPITAL IMPROVEMENT PROJECTS

The CIP develops the timeline for airport improvements and estimated costs for those improvements. The plan is divided into three phases: Phase I (2012 - 2016), Phase II (2017 - 2021), and Phase III (2022 - 2031).

Below is the anticipated plan for the Airport to meet projected demand. Funding for these projects has not yet been committed and the actual costs may vary depending upon final construction costs. The date of implementation may also vary due to funding availability.

Phase I (2012-2016)

Phase I is the first five years of the planning period, through 2016. Phase I development projects are further broken down into specific years. Projects in this phase include:

Construct Air Traffic Control Tower (2012). The ATCT project has been funded through the *Connect*Oregon III Grant Program. The purpose of the project is to increase safety by providing aircraft separation and sequencing at the Airport. The ATCT will also assist with the Airport's noise abatement

efforts, by directing traffic away from noise sensitive areas during approach, departure, and while in the pattern. The location of the tower is shown on the ALP drawing.

Construct Service Road (2012). In order for ground vehicles to operate safely, a service road will be constructed to separate vehicles from taxiing aircraft. The service road is shown in blue on the ALP.

Pavement Maintenance Program (PMP) Repairs (2013). ODA's share for pavement maintenance through this program is 75% of the total repair cost. Actual work items will be identified in the year prior to maintenance actions.

Construct Helicopter Parking Locations (2014). A safety deficiency identified in the planning process was the lack of helicopter parking locations on state property. As such, two such pads have been included on the ALP for future construction.

Reconstruct State-Leased Ramp (2014). The state-leased apron in front of Aurora Aviation has failed and is in need of reconstruction. This item is programmed for 2014, to be constructed in conjunction with the helicopter parking pad project.

Taxilane Development for Hangar Access (2014). This item includes prep work for hangar development in the following construction season.

Hangar Development (2015). An area for hangar development was identified on the ALP. The CIP breaks the development of the hangar area into three phases, as development will likely occur over a span of many years to react to demand. Each phase represents development of approximately 10 hangars, or 44,000 square feet of hangar space.

Carryover Entitlements (2015). ODA currently receives funding for the Airport through the Non-Primary Entitlement Program, funded by the Federal Aviation Administration (FAA). These funds can be accrued and carried over for up to four years, so that the airport sponsor can bank the funds in anticipation for upcoming projects. It is recommended ODA carryover the entitlement funds in 2015 in preparation for the upcoming runway improvement project (to be further discussed below).

Conduct Environmental Assessment for Runway Improvements (2016). The runway improvement project will require review under the National Environmental Policy Act (NEPA). At this time it is anticipated the appropriate environmental review will be an Environmental Assessment (EA).

PMP Repairs (2016). The PMP operates on a three-year cycle. Specific pavement maintenance items will not be identified until 2015.

Phase II (2017-2021)

Phase II is the second five years of the planning period, 2017-2021. Projects during this phase include:

Aurora Rural Fire Protection District (RFPD) Response Facility (2017). The Aurora RFPD has requested an area on the Airport be reserved for a future response facility, which is reflected on the ALP. It is anticipated the facility will be constructed during Phase II of the CIP.

Carryover Entitlements (2017). It is recommended that ODA complete the EA in 2017 and carryover any entitlement funds for the upcoming runway improvement project.

Displace Runway 17 Threshold (2018-2020). As stated in Chapter Six, the Oregon Aviation Board has requested a modification to standards for application of declared distances at the Airport. If approved, it is anticipated the work associated with displacing the threshold will occur over a multi-year period. Specific items related to the Runway 17 displaced threshold are:

- Property acquisition for the extended runway and taxiway pavements (2018) - approximately 2.2 acres.
- Avigation easement acquisition for the Runway 17 runway protection zone (2018) - approximately 2.6 acres.
- Carryover entitlements (2019).
- Extend runway and taxiway pavement and displace the Runway 17 threshold by 800 feet (2020).
- Install precision approach path indicators to Runway 17 and Runway 35 (2020).
- Construct Runway 17 run-up area (2020).

Extend Runway 35 (2018-2020). If the FAA does not approve the Runway 17 displaced threshold, a 1,000-feet extension to Runway 35 will be pursued. The extension would occur over a multi-year period, which would include:

- Property acquisition for the Runway 35 runway protection zone (2018) - approximately 44.5 acres.
- Relocation of Keil Road, as shown on the ALP (2019).
- Extension of Runway 35 by 1,000 feet (2020).
- Installation of precision approach path indicators (2020).

The runway extension pavement would remain within the current Airport boundary. Additional land acquisition is needed to secure the runway safety area and runway protection zone, to maintain compatible land uses within these areas. Farm use is a compatible land use in these areas, with a few exceptions.

PMP Repairs (2019). Specific pavement maintenance items will not be identified until 2018.

Taxilane Development for Hangar Access (2019). This item includes preparation for hangar development in the 2021 construction season.

Runway 17/35 Strengthening Overlay (2020). In conjunction with one of the above-stated runway improvement projects, the runway would be overlaid to increase the pavement strength to 60,000 lbs dual wheel gear by constructing a ½" grind and 3" overlay along with 2.5" transitions to connector taxiways.

Hangar Development (2021). An area for hangar development was identified on the ALP. The CIP breaks the development of the hangar area into three phases, as development will likely occur over a span of many years to react to demand. This would be the second phase of development.

Update Master Plan (2021). Master Plans are typically updated every eight to ten years. It is recommended this plan be updated after completion of the runway improvement project.

Phase III (2022-2031)

Phase III is the last ten years of the planning period, 2022-2031. Specific years for these projects were not identified, except for PMP, as any projection would be speculative. Projects falling within this timeframe include:

PMP Repairs (2022, 2025, 2028, 2031). Specific pavement maintenance items will not be identified until the year prior to the program cycle.

Apron Development. Additional tiedown apron parking is identified in the ALP and should be constructed when demand necessitates.

Taxilane Development for Hangar Access. This item includes preparation for hangar development in the following construction season.

Hangar Development. An area for hangar development was identified on the ALP. The CIP breaks the development of the hangar area into three phases, as development will likely occur over a span of many years to react to demand. This would be the final phase of development.

Cargo Apron. In accordance with the Oregon Aviation Plan recommendation, an area for cargo loading/unloading has been identified for construction.

Relocate Fuel Tanks. The Aurora Aviation fuel tanks are in an area that could be better used for other purposes. Once the tanks reach their useful life, they should be replaced elsewhere on the Airport (a location is identified on the ALP).

Construct Runway 17 Run-Up Area. Once the fuel tanks have been relocated, the area where they are currently located should be reconfigured to serve as a run-up area for Runway 17. (This assumes the displaced threshold project was not approved, and therefore the run-up area was not constructed as per the work items for the displaced threshold project).

PROJECT COSTS

A list of improvements and costs over the next 20 years are in **Table 7A**. All costs are estimated in 2011 dollars. Total project costs include construction, temporary flagging and signing, construction staking, testing, engineering, administration, and contingency, as applicable. Power utilities are included in all new hangar projects. No water service cost was added for the hangar developments. Project estimates are included in **Appendix L** for more detailed cost information.

Table 7A. Aurora State Airport Proposed Capital Improvement Plan with Costs

Aurora State Airport CIP 2012 – 2031							
#	Year	Description	Total Cost	ODA share	FAA Share	Private Share	Other Funding
Phase I (2012-2016)							
1	2012	Construct ATCT[1]	3,369,000	423,800	250,000	-	2,695,200
2	2012	Service Road	1,017,000	50,850	966,150	-	-
3	2013	PMP (2013)[2]	27,000	20,250	6,750	-	-
4	2014	Helicopter Landing Pads	11,000	550	10,450	-	-
5	2014	Ramp Reconstruction - State Leased	988,000	49,400	938,600	-	-
6	2014	Taxilane Development (Hangar Access)	43,000	-	-	43,000	-
7	2015	Hangar Development	2,088,000	-	-	2,088,000	-
8	2015	Carryover Entitlements	-	-	-	-	-
9	2016	Environmental Assessment (Runway Improvements)	350,000	17,500	332,500	-	-
10	2016	PMP (2016)	27,000	20,250	6,750	-	-
		Phase I Subtotal	*$7,920,000*	*$582,600*	*$2,511,200*	*$2,131,000*	*$2,695,200*
Phase II (2017-2021)[3]							
11	2017	Aurora RFPD Response Facility	570,000	-	-	570,000	-
12	2017	Carryover Entitlements	-	-	-	-	-
Displace Threshold	13	2018	Property Acquisition (R17 Displaced Threshold)	102,000	5,100	96,900	-	-
Displace Threshold	14	2018	Avigation Easement Acquisition (R17 RPZ)	44,000	2,200	41,800	-	-
Displace Threshold	15	2019	Carryover Entitlements	-	-	-	-	-
Displace Threshold	16	2020	Displaced Threshold (R17 - 800')	1,980,000	99,000	1,881,000	-	-
Displace Threshold	17	2020	Install Runway 17-35 PAPIs	129,000	6,450	122,550	-	-
Displace Threshold	18	2020	R17 Run-Up Area	355,000	17,750	337,250	-	-
1,000' Ext.	19	2018	Property Acquisition (R35 RPZ)	2,561,000	128,050	2,432,950	-	-
1,000' Ext.	20	2019	Keil Road Relocation	1,427,000	71,350	1,355,650	-	-
1,000' Ext.	21	2020	Runway Extension (R35 - 1000')	3,035,000	151,750	2,883,250	-	-
1,000' Ext.	22	2020	Install Runway 17 PAPIs	65,000	3,250	61,750	-	-
23	2019	PMP (2019)	27,000	20,250	6,750	-	-
24	2019	Taxilane Development (Hangar Access)	43,000	-	-	43,000	-
25	2020	R17/35 Strengthening Overlay	2,052,000	102,600	1,949,400	-	-
26	2021	Hangar Development	2,088,000	-	-	2,088,000	-
27	2021	Master Plan Update	200,000	10,000	190,000	-	-
		Phase II Displaced Threshold Subtotal	*$7,590,000*	*$263,350*	*$4,625,650*	*$2,701,000*	*$ -*
		Phase II Runway Extension Subtotal	*$12,068,000*	*$487,250*	*$ 8,879,750*	*$2,701,000*	*$ -*

Aurora State Airport CIP 2012 – 2031							
#	Year	Description	Total Cost	ODA share	FAA Share	Private Share	Other Funding
Phase III (2022-2031)							
28	-	PMP (2022, 2025, 2028, 2031)	108,000	81,000	27,000	-	-
29	-	Apron Development	1,638,000	81,900	1,556,100	-	-
30	-	Taxilane Development (Hangar Access)	43,000	-	-	43,000	-
31	-	Hangar Development	2,088,000	-	-	2,088,000	-
32	-	Cargo Apron	198,000	9,900	188,100	-	-
33	-	Relocate Fuel Tanks	89,000	4,450	84,550	-	-
34	-	R17 Run-Up Area[4]	355,000	17,750	337,250	-	-
		Phase III Subtotal	*$ 4,519,000*	*$ 195,000*	*$ 2,193,000*	*$ 2,131,000*	*$ -*
		Total Capital Costs with Displaced Threshold Option	**$20,029,000**	**$1,040,950**	**$9,329,850**	**$6,963,000**	**$2,695,200**
		Total Capital Costs with Runway Extension Option	**$24,507,000**	**$1,264,850**	**$13,583,950**	**$6,963,000**	**$2,695,200**

[1] *Other Funding is Connect Oregon III Grant*
[2] *ODA share for PMP is 75% of total cost*
[3] *Items 13-18 or Items 19-22 to be implemented, pending FAA determination*
[4] *If no displaced threshold project; construct R17 run-up at same time as fuel tank relocation project.*

FINANCIAL PLAN

This section presents the financial implementation analysis for Aurora State Airport and will examine various facets of the financial operating condition of the Airport. In addition, this chapter examines the Airport's historic operating revenues and expenses, and provides projections for future financial results. The projections of Airport revenues and expenses focus on incremental periods similar to the planning periods of this Master Plan's CIP: Phase I (Short Term, 2012-2016), Phase II (Intermediate Term, 2017-2021), and Phase III (Long Term, 2022-2031). These planning periods are used to identify the ability of the Airport to contribute to the local share of anticipated project costs, as required. It should be noted that Aurora State's Master Plan CIP is used as a guideline, and that capital projects should be undertaken when demand warrants and funding becomes available.

Financial Implementation Analysis Approach

The overall approach for the development of the financial implementation analysis included the following elements:

- Gathered and reviewed key airport documents related to historical financial results, capital improvement plans, operating budgets, regulatory requirements, and airport policies
- Evaluated Airport rates/charges and compared them with other airports
- Analyzed the existing operating and financial environment, as well as the overall financial management philosophy

- Reviewed the Master Plan CIP, cost estimates, and development schedule anticipated for the planning period in order to project the overall financial requirements for the program
- Determined and analyzed the sources and timing of capital funding available to meet the financial requirements for funding the CIP
- Analyzed historical operating revenues, developed operating revenue assumptions, and projected future operating revenues for the planning period
- Analyzed historical operating expenses, developed operations and maintenance expense assumptions, and projected future operating costs for the planning period
- Completed results of the analysis and evaluation in a Financial Plan Summary that provides conclusions regarding the financial practicality of the CIP

Airport Rates Comparison

Airport revenues are typically generated through user fees charged for the facilities and services that are provided. These fees are normally based on market conditions in the area and vary airport-to-airport. The airports pricing strategy should be to charge "market" rents for land and improvements (as is mandated by the FAA). Although limited data on existing rates for Aurora and other Oregon airports was provided for this study, a discussion on a broad range of typical airport rates and charges is provided below. Some of the typical rates highlighted within this section were produced by the *AAAE Rates and Charges Survey* conducted by the American Association of Airport Executives. These rates were determined from a small representative sample of airports throughout country and should be considered for comparison purposes only. Rates set by the ODA at Aurora State Airport should be determined through close coordination with airport and ODA management and based on the unique condition, amenities, location and demand for facilities.

Ground (Land) Lease

Nationally, most airport tenants lease land from an airport on which they have constructed hangars and other aviation-related facilities. Generally, the lease rate should be adjusted every three years to keep pace with changes in the general price levels as reflected in the U.S. Department of Labor's Bureau of Labor Statistics Consumer Price Index (CPI).

Table 7B contains the results of a 2008 ODA ground lease rate survey which compares the lease rates of Aurora State Airport to several other general aviation airports throughout Oregon. Land lease rates range from $0.08 to $0.25 per square foot annually. Due to its location and demand, ground lease rates at Aurora are higher than all other airports surveyed throughout the state. The average ground lease rate of those surveyed is $0.105 per square foot.

Table 7B. Oregon Airport Ground Lease Rates

Airport	Annual Rate (sq. ft.)	Airport	Annual Rate (sq. ft.)
Alkali Lake	$ 0.08	Nehalem Bay	$ 0.08
Aurora	$ 0.25	Oakridge	$ 0.08
Bandon	$ 0.18	Owyhee Reservoir	$ 0.08
Cape Blanco	$ 0.10	Pacific City	$ 0.08
Cascade Locks	$ 0.08	Pinehurst	$ 0.08
Chiloquin	$ 0.09	Prospect	$ 0.08
Condon	$ 0.08	Rome	$ 0.08
Cottage Grove	$ 0.15	Siletz Bay	$ 0.13
Independence	$ 0.18	Toketee	$ 0.08
Joseph	$ 0.11	Toledo	$ 0.08
Lebanon	$ 0.16	Wakonda	$ 0.08
McDermitt	$ 0.08	Wasco	$ 0.08
McKenzie Bridge	$ 0.08		

Source: Ground lease surveys commissioned by ODA, January 2008

Based on a national survey of 38 similar airports, the average airport receives $0.24 per square foot for unimproved ground leases. Based on this and the high degree of rate fluctuation between airports, the ground lease rate at Aurora State Airport appears to be consistent with its attributes and industry standards. For ground leases with improved features including smooth/flat grading, utilities nearby, and convenient/established access, on average, airports collect $0.33 or more per square foot each year.

Landing Fees

Less than 30 percent of airports throughout the country collect landing fees. Of those, less than half are collected by the Fixed Base Operator (FBO) on the airport and the fees are generally waived if fuel is purchased. The methodology used for determining landing fees varies widely and is as different as each airport. The following is a brief list of some of the landing fee methodologies applied at various airports;

- Only Aircraft over 50,000 lbs.
- $0.60 per 1,000 lbs. of max. gross take-off weight
- $0.08 per 1,000 lbs. for each aircraft
- $1.00 per 1,000 lbs. of max. landing weight over 12,500 lbs.
- $0.35 per 1,000 lbs. max. gross landing weight
- $1.50 per 1,000 lbs. max. gross take-off weight over 12,500 lbs.
- $1.00 per 1,000 lbs. max. gross landing weight for non-based aircraft with empty weights over 30,000 lbs.
- $0.07 per 1,000 lbs. for aircraft over 35,000 lbs.

These rates are provided for informational purposes. To remain competitive, it is not suggested that Aurora State Airport introduce/adjust a landing fee.

Tie Down Fees

A majority of airports charge a monthly tie-down fee for single engine aircraft. Based on a national survey, the average tie down fee is about $45.00 per month, although this varies greatly between

airports based on location and demand. Some airports collect a separate fee for multi-engine aircraft since they are larger and take up more room. These aircraft, however, typically use hangar storage due to their higher value. The average monthly tie down fee for multi-engine aircraft is $52.00. Many airports charge a daily tie-down fee. Though, like landing fees, many FBOs may waive this fee with the purchase of fuel.

T-Hangar/Conventional Hangar Rates

T-hangars provide individual hangars within a larger contiguous building. T-hangars are the most basic and affordable form of aircraft hangar infrastructure available to aircraft owners. Generally, they are built to hangar a single engine to a small multi-engine aircraft. Aircraft larger than these will require conventional hangar space. T-Hangar facilities provide an area of approximately 1,300 square feet per individual storage unit.

The AAAE Rates and Charges Survey determined monthly hangar fees at an average of $306.00 per month. However, the survey did not differentiate if the hangars were large or small. There are numerous factors that influence the price airports set for hangar fees, some of these being airport location, hangar amenities, demand, etc. At those airports which responded to the survey, fees ranged greatly from $78.00 to $1,200 per hangar per month.

Many airports throughout the country are choosing to lease land to an FBO or developer to construct T-hangars or conventional hangars and lease the individual units to aircraft owners. This trend is growing in popularity because it frees the airport from the burden of leasing and maintaining the space as well as collecting rent from multiple tenants.

Community Hangar Rates

Normally, community hangars are not owned or operated by the airport and are designed to accommodate numerous aircraft ranging in size from single engine aircraft up to large jets. This allows the aircraft owner the ability to have a larger space than a T-hangar while lowering costs by sharing space with other tenants. The average fee per month for community hangar space to accommodate a small multi-engine aircraft was $345.00. As with many of the other rates and charges discussed in this section, the rates in community hangars vary greatly based upon location, amenities, demand, etc.

Fuel Flowage Fee

In addition to charging FBOs land and/or facilities rent, some airports charge a fuel flowage fee to allow the service provider the right to sell fuel at the airport. In a national survey of 88 airports, 29 airports charged a fuel flowage fee to anyone selling fuel. The fee averaged $0.07 per gallon which is typically passed along to the customer purchasing fuel. Fuel flowage fees had a broad range, with the lowest being $0.03 and the highest being $0.20 per gallon. ODA charges fuel flowage fees at the Aurora State Airport.

There are many other rates and charges common to airports throughout the country. Those described above are some of the most common.

Capital Funding Sources

The development of the Aurora State Airport's Master Plan CIP is anticipated to be funded from several sources. These sources include federal grants, state grants, net operating revenues/cash reserves, and other unidentified funding sources, including private funding. Each of these sources of funds is described in the following sections.

Federal Aviation Administration (FAA) Funding

To promote the development of airports to meet the nation's needs, the Federal Government embarked on a Grants-In-Aid Program to units of state and local government after the end of World War II. Following multiple earlier versions of federal funding programs, the Airport Improvement Program (AIP) was established through the Airport and Airway Improvement Act of 1982. The initial AIP provided funding legislation through fiscal year 1992, but since then, it has been authorized and appropriated on a yearly or even quarterly basis. Funding for the AIP is generated through taxes on airline tickets, freight way bills, international departure fees, general aviation fuel, and jet fuel.

AIP grants include entitlement grants, which are allocated among airports by a formula that is driven by passenger enplanements, and by discretionary grants that are awarded in accordance with specific guidelines. Generally, primary airports receive entitlements based on the number of enplaning passengers and landed cargo weights, while non-primary airports, which include general aviation airports, likewise receive some entitlements and may also be eligible for federal state apportionment funding. The total amount of state apportionment funding is based on an area/population formula for the state, while the amount of non-primary entitlements is computed from the needs list for the particular airport in the published National Plan of Integrated Airport Systems (NPIAS). Federal Airport Improvement Funds must be spent on FAA-eligible projects as defined in FAA Order 5100.38C "*Airport Improvement Program (AIP) Handbook*." The handbook and the latest authorization state that:

- An airport must be included in the current version of the NPIAS;
- Non-primary entitlement funds of $150,000 per year can be accumulated for up to four years;
- The federal portion of AIP grants increases to 95% for all general aviation airports; and
- If an airport has no airside improvement needs, entitlement funds can be used for certain landside projects.

General aviation and commercial service airports also compete for federal discretionary funds. These funds are awarded based on priority ratings given to each potential project by the FAA. The prioritization process makes certain that the most important and beneficial projects (as viewed by the FAA) are the first to be completed, given the availability of adequate discretionary funds. Federal funding is limited to development that is justified to meet aviation demand according to FAA guidelines. Each NPIAS airport development project is subject to eligibility and justification requirements as part of the normal AIP funding process.

As of the writing of this document, the AIP program is due for reauthorization and will likely see changes. The future of the AIP program may include changes to federal share amounts, non-primary entitlements, set-asides, and/or passenger facility charges (PFCs).

However, under the current reauthorization legislation and based on its inclusion in the NPIAS, the Aurora State Airport is currently eligible to receive entitlements of $150,000 per year from 2010 through 2030. Additional funding could be realized through state apportionment funding and AIP discretionary funding, based on the aforementioned project eligibility ranking methodology. For the Aurora State Airport CIP, this financial plan assumes total AIP grant awards (entitlement/discretionary) funding of $370,000 for the Phase I period, $11.4 million during Phase II, and $3.1 million for Phase III.

Oregon Department of Aviation (ODA)

Airports that are owned by local municipalities or governments are typically responsible for capital improvement project costs remaining from funding not eligible through FAA grants mentioned above. As a state owned airport, the CIP for Aurora State Airport is managed by ODA. Improvements at Aurora State, along with the needs of over 30 state airports, are balanced as funds are available. Demand for funding far exceeds the annual funding; the result is that many projects are deferred over extended periods until funding can be obtained. The state also looks to local communities to support the funding of capital improvement projects.

ODA administers several programs for funding airport planning, construction and maintenance projects. As mentioned before, Aurora State Airport must compete with other airports in the state through these funding programs. The following is a description of each funding program:

Pavement Maintenance Program (PMP).

The pavement maintenance program provides a resource for airfield pavement maintenance projects. The program funds pavement maintenance and associated improvements (crack filling, repair, sealcoats, etc.), which have not traditionally been eligible for FAA funding. The PMP may also be expanded to include pavement overlays, which could potentially be used for Runway 17/35, where FAA funding is not available.

Funding for the PMP is generated through collection of aviation fuel taxes. ODA manages the PMP through an annual consultant services contract and work is programmed on a 3-year regional rotation. The program includes a regular schedule of inspection and subsequent field work. Benefits from the PMP include:

- Economy of scale in bidding contracts
- Federal/State/Local partnerships that maximize airport improvement funds
- PMP is not a grant program and local match is on a sliding scale (50% - 5% required)

The PMP includes the following features:

- Review prior year's Pavement Condition Index (PCI) reports
- Only consider PCIs above 70
- Apply budget
- Limit work to patching, crack sealing, fog sealing, slurry sealing
- Add allowance for striping
- Program to include approximately 20 airports per year, depending on funding levels

Financial Assistance to Municipalities (FAM) Grant Program

ODA also provides limited funding assistance through the FAM Grant Program to foster a statewide system of airports by providing the discretionary award of financial assistance for airport planning, development and capital improvement projects. Program funding depends upon the dedicated FAM Grant Program amount in the ODA's biennial budget, as approved by the Oregon Legislature; and ODA policies and priorities.

The FAM details include the following:

- Maximum possible annual grant amount per airport is $25,000
- The local match requirement parallels the PMP that links the match amount to the airport category as designated in the Oregon Aviation Plan
- The match structure progresses from 5% to 50% based on airport category
- Eligible airport capital improvement projects and planning projects are to be selected on a priority basis
- FAM Grants may also be used as sponsor match for Federal Aviation Administration AIP grants

For the Aurora State Airport CIP, this financial plan assumes state apportionment of $720,000 in Phase I, $620,000 in Phase II, and $270,000 in Phase III.

Other Capital Funding

The traditional funding sources described in previous paragraphs are often insufficient to finance the full range of projects programmed for development during a CIP. Due to the lack of traditional funding, other non-traditional funding sources will be needed to implement non-eligible AIP projects. Alternative sources of funds will require about $6.8 million in Phase I, $1.2 million in Phase II, and $1.2 million in Phase III. The sources of these other funding needs have been identified in broad terms and will likely be needed to supplement the total capital shortfall of almost $10 million through the 20-year planning period. If these funding sources cannot be ultimately obtained in the time frames needed, the associated projects will have to be delayed until such time as appropriate funding can be identified.

Note that non-traditional funding sources for airport development may include the following sources:

- *Connect*Oregon III
- General Fund Revenues
- Bond Issues
- Private Funding

Of these, general fund revenues and general obligation bonds are by far the most common funding sources. Revenue bonds supported by airport generated revenues are seldom used at general aviation airports because most general aviation airports do not generate enough money to pay operating expenses and the debt service of capital funding requirements.

*Connect*Oregon III

The 2009 Oregon Legislature approved $95 million in lottery-backed bonds for the *Connect*Oregon III program and $5 million for rural airports as part of HB 2001, the Jobs and Transportation Act. Building

on the success of the first two authorizations in 2005 and 2007, ConnectOregon III will continue to improve the connections between the various modes of transportation throughout the state.

General Fund Revenues

Capital development expenditures from general fund revenues have been somewhat difficult to obtain in recent years. One reason for this difficulty is the shortfall in local general fund revenues. Budgetary problems have created an environment where local funding is uncertain. The amount of general fund support for airport improvement projects varies by airport and is generally based upon the local tax base, priority of the development project, historical funding trends, and local attitudes concerning the importance of aviation.

Bond Funds

Airport authorities can issue bonds without approval from the city or county. However, they must use their own revenue to repay the bonds. Airport revenue is typically used to repay these bonds. For an airport operated by a state, like Aurora, bond issues funding the state share of airport development projects would likely compete with bond issues for other types of state improvements. As with the general fund apportionment, bond issues supporting airport development depend greatly on the priority assigned to such projects by the state and local community.

Private Funds

Items such as storage and maintenance hangars, fuel systems, and pay parking lots are not typically eligible for federal or other grant funding assistance at public airports because they generate income for the airport. Airport operators sometimes work with FBOs or other local businesses to fund these types of improvements.

With respect to Aurora State Airport, each of these options would need to be weighed independently to determine the appropriateness of their potential application for eligible projects.

Financial Analysis and Implementation Plan

This section evaluates the financial reasonableness of implementing the Master Plan CIP during the planning period (2012 through 2031).

Estimated Project Costs and Development Schedule

A listing of capital improvement projects has been assembled based on the preferred development alternative for the Aurora State Airport established in earlier sections of this Master Plan. This project list has been coordinated with the Airport Layout Plan (ALP) drawing set and the CIP, both of which should be continuously updated by airport management, as required. Generally, the CIP itself has three primary purposes:

1. Identify improvement projects that will be required at an airport over a specific period of time;
2. Estimate the order of implementation of the projects included in the plan; and
3. Estimate the total costs and funding sources of the projects.

It is important to note that as the CIP progresses from project planning in the current year to projects planned in future years, the plan becomes less detailed and more flexible. Additionally, the CIP is typically modified on an annual basis as new projects are identified, projects change, and financial environments evolve.

For Aurora State Airport, each proposed capital improvement project over the 20-year planning horizon has been assigned to one of three specific planning periods: Phase I, short term (2012-2016); Phase II, intermediate term (2017-2021); and Phase III, long term (2022-2031) as shown in the above Table 7A. This table also includes estimates of the funding source eligibility for each project. Note that the estimates contained in this table were derived from analyzing similar projects, but should be re-evaluated at the time of initiation.

Phase I contains approximately $7.9 million in capital projects including air traffic control tower construction, service road construction, apron repair, hangar and associated taxilane construction, helipad development and an environmental assessment for runway enhancements to take place later in the planning period. It is estimated that the sponsor (ODA) share of Phase I capital costs will be approximately $582,600 and the federal share will be about $2,511,200 with the balance (approximately $4.8 million) coming from other sources.

Phase II contains approximately $12.0 million in total capital projects. Most projects in this phase are related to Runway 17/35 improvements and include runway paving, possible road relocation as well as property acquisitions for runway protection zones (RPZ), avigation easements and runway improvements. Other projects in this phase are for hangar and associated taxilane construction and airfield support systems. The ODA share of the proposed development plan in Phase II is approximately $500,000 while most of the funding is coming from the FAA. The emergency response facility, hangar and taxilane development is funded from private sources.

It is important to note, either project items 13-18 or items 19-22 may be implemented, depending on FAA determination. This being the case, total project costs associated with this phase are listed by the most costly alternative (runway extension) to plan conservatively in the financial analysis.

Phase III contains $4.5 million in total capital projects, including apron development as well as fuel tank relocation and Runway 17 run-up area development. As with all other phases, this phase also includes hangar and associated taxilane development to keep pace with expected demand. In addition, like all other phases, this phase includes on-going PMP projects to maintain the Airport's runway and taxiway system. About $200,000 are expected to be funded by ODA in this phase. The FAA share is approximately $2.1 million, with the remainder coming from private sources.

Airport Revenues and Expenses

For Aurora State Airport, operating revenues are realized from the following primary sources:

- Licenses and Fees
- Rents and Royalties
- Miscellaneous Revenues

Landside facility development and levels of aviation activity are typically the primary factors affecting airport operating revenues. Note that as additional airport development occurs, the number of based aircraft and aircraft operations will normally increase and new/updated leases will be enacted, typically resulting in airport operating revenues increasing in a corresponding fashion.

Airport operating revenues are offset by airport operating expenses, typically referred to as Operation and Maintenance (O&M) costs. Airport operating expenses are comprised of the day-to-day costs incurred by operating the airport. Primary components of O&M costs at Aurora State Airport include Salaries and Wages as well as Services and Supplies and are made up of the following:

- Personnel Services – Includes full-time salaries, overtime pay, accrued personal leave, payroll taxes, health insurance, pension and retirement benefits, unemployment insurance and workers' compensation expense.
- Fixed Costs – Includes building rentals, insurance (building, vehicle, liability, etc.), phones (cell/land), utilities (power, natural gas, trash, etc.), irrigation assessments, etc.
- Administrative Costs – Includes office supplies, postage, printing, computer software, personnel equipment, operations supplies, advertising, marketing, training, dues, small equipment, etc.
- Operations Expenses – Includes repair/maintenance of buildings (hangars, terminal), ground maintenance (asphalt, pests, snow, weeds, lawns), vehicles (repair, maintenance, fuel), repair/maintenance of equipment (fuel island, beacon, windsock, NAVAIDS, taxiway/runway lights), security (fences, gates, cameras), etc.
- Contractual Services – Includes large maintenance projects, background checks, lot surveys, consultant services, merchant fees, etc.

The ODA oversees two funds as a part of the operation at Aurora State Airport: the Public Transportation Fund and Capital Projects Fund.

Public Transportation Fund

Revenues of this fund are generated through the collection of Airport fees, licenses, rents, royalties and other sources. The Public Transportation Fund expenses are used to maintain the day-to-day operations of the Airport as well as to pay for some professional services required by the Airport. A large share of revenue in the Fund is from federal sources, other grants and fund transfers. Similarly, a substantial expense to this fund is through professional service expenses incurred by the Airport for projects. These items are not considered part of the Airport's daily operating budget and will not be included in the analysis of operating income.

Capital Projects Fund

Typically, capital costs associated with infrastructure development comes the Capital Projects Fund budget. The primary source of revenue for the Capital Projects Fund is from the FAA through AIP eligible project grants. Additional funds may come from other sources as well.

The historic revenues and expenses for these two funds, as they are related to Aurora State Airport, over fiscal years 2007 to 2010 are presented in **Table 7C**.

Table 7C. Aurora State Airport Funds

	FY2007	FY2008	FY2009	FY2010
Public Transportation Fund				
Licenses and Fees	$ 869.94	$ 116,748.35	$ 122,970.60	$ 128,357.96
Rents and Royalties	149,205.80	55,342.11	44,461.20	63,428.09
Other Misc. Revenues	11,833.85	1,807.35	11,649.62	12,309.91
Revenues	*$ 161,909.59*	*$ 173,897.81*	*$ 179,081.42*	*$ 204,095.96*
Salaries and Wages	19,288.20	19,234.37	19,263.29	14,426.09
Services, Supplies, Other	65,793.70	56,666.85	38,435.26	81,609.40
Expenses	*$ 85,081.90*	*$ 75,901.22*	*$ 57,698.55*	*$ 96,035.49*
Operating Income	$ 76,827.69	$ 97,996.59	$ 121,382.87	$ 108,060.47
Capital Projects Fund				
Revenues	$ 207,856.00	$ 2,905,882.60	$ 1,857,084.51	$ 13,198.01
Expenses	155,561.62	3,524,431.15	1,005,192.61	0.01
Capital Projects Fund Total	$ 52,294.38	$ (618,548.55)	$ 851,891.90	$ 13,198.00

** Public Transportation Fund balances above do not reflect federal or other grant contributions as well as professional service fee expenses (which may be eligible for grant reimbursement)*

Projected Airport Operating Revenues and Expenses

The continued growth of Aurora State Airport, in terms of activity, tenants, new leases and facility development, will impact the Airport's operating revenues and expenses over the planning period. Actual future financial outcomes will be determined by a variety of factors, many of which are impossible to identify at the current time. However, the projections for airport operating revenues and expenses are based on recent financial results, year-to-date revenues and expenses for 2011, and activity and tenant growth trends identified in Chapter Three.

Projections of future airport operating revenues and expenses at Aurora State Airport for the periods 2015 through 2030 are presented in **Table 7D**. The following information for operating revenues was established through close consideration of historical trends, as well as proposed airport development initiatives and how they might impact those future revenues. In most cases, revenue projections resulted from normal growth factors refined to more closely reflect the circumstances of Aurora State Airport. The table below projects the Public Transportation Fund only, since Capital Project funds are determined almost solely on project eligibility and grant availability which fluctuates greatly from year-to-year. Further, it is important to note that federal revenue and contributions from other funds as well as professional service expenses to the Public Transportation Fund are not included in this projection as they have varied significantly from year-to-year and do not reflect true operating income.

Table 7D. Projected Aurora State Airport Operating Revenues and Expenses

	Current FY2011	FY2015	FY2020	FY2025	FY2030
Public Transportation Fund					
Licenses and Fees	$ 128,357.96	$ 145,000	$ 176,000	$ 224,000	$ 300,000
Rents and Royalties	63,428.09	71,000	87,000	111,000	148,000
Other Misc. Revenues	12,309.91	14,000	17,000	22,000	29,000
Revenues	*$ 204,095.96*	*$ 230,000*	*$ 280,000*	*$ 357,000*	*$ 477,000*
Salaries and Wages	14,336.84	16,000	19,000	24,000	33,000
Services, Supplies, Other	96,035.49	108,000	128,000	164,000	219,000
Expenses	*$ 110,372.33*	*$ 124,000*	*$ 147,000*	*$ 188,000*	*$ 252,000*
Operating Income	$ 93,723.63	$ 106,000	$ 133,000	$ 169,000	$ 225,000

**Does not include federal or other grant revenues or professional service expenses*

Revenues were projected to increase at standard rates (starting at 3% annually) that will increase beyond FY2015 to account for increased tenants and the resulting volume of activity. In operating expenses, increases in salaries, as well as overall operational activities are based on accepted inflationary growth rates (primarily a 3% annual growth), with slightly higher growth factors for fuel costs in order to account for some volatility in the supply market, as well as for the overall personnel costs.

Based on anticipated CIP project costs and the projected operating income shown above, annual income from the Airport's operation will be sufficient to cover the ODA share of CIP project related costs in Phase I. The ODA share of CIP Phase I costs amounts to $582,600. When projected income is interpolated from the table above for each year FY2011 through FY2016, it is estimated that the Airport could expect about $610,000 in operating income over the 6-year period to go toward CIP projects. Additionally, ODA's projected income during CIP Phases II and III is expected to cover the agency's project share.

Financial Plan Summary

The primary goal is for the Airport to evolve into a facility that will best serve the air transportation needs of the region while simultaneously developing into a self-sustaining economic generator. This Master Plan Update can best be described as being the road map to helping the Airport achieve these goals. But it should be recognized that planning is a continuous process that does not end with the completion of the Master Plan in that the fundamental basic issues that have driven this Master Plan will remain valid for many years. Therefore, the ability to continuously monitor the existing and forecast status of airport activity will be a key ingredient in maintaining the applicability and relevance of this study.

In order to realize those goals through the successful implementation of airport development projects, sound and measured decisions by the ODA must be made. Two of the most important factors in influencing the decision to move forward with a specific improvement are airport activity and funding timing. Both factors must be considered in the implementation of this Master Plan in that while airport

activity levels provide the "what" and the "why" in the establishment of airport improvements, the timing of funding provides the "how." Through the course of this Master Plan effort, the "what" and the "why" have been discussed in detail in previous sections. This chapter has addressed the "how" by providing an overview of the sources of potential funding and the practical financial realities required to implement this overall airport development program. However, although every effort has been made in this chapter to conservatively estimate when facility development may be required, aviation demand and the availability of financial resources for capital projects will ultimately dictate when facility improvements need to be implemented, accelerated or delayed.

Previous sections of this analysis provided a practical approach for scheduling capital expenditures to match the availability of capital financing. It is important to note, however, that ODA does not allocate any indirect revenues or expenses to any of their 28 airports. All the expenses and revenues on the statements provided are those that are specific to Aurora State Airport. As such, any additional ODA revenues would not be allocated to Aurora State Airport until the project costs are incurred and revenues are transferred. Based on ODA acceptance of CIP projects and the understanding that funding for the state's obligation will be met at the time of project implementation, the Master Plan CIP is financially possible.

Key assumptions supporting the financial plan relate to the availability and timeliness of the funding sources that have been indicated. Continuation of the AIP entitlement program at authorized funding levels is essential. Receiving state apportionment and AIP grants of approximately $1.1 million during Phase I, almost $12 million during Phase II, and $3.4 million during Phase III as indicated are critical to the financial feasibility of implementing these projects.

Appendix A:
GLOSSARY OF TERMS AND ACRONYMS

Airport Master Plan Update

Aurora State Airport

Appendix A
GLOSSARY OF TERMS

DEFINITIONS

ACCELERATE – STOP DISTANCE AVAILABLE (ASDA). See declared distances.

AIR CARRIER. An operator, which: (1) performs at least five round trips per week between two or more points and publishes flight schedules which specifies the times, days of the week, and places between which such flights are performed; or (2) transport mail by air pursuant to a current contract with the U.S. Postal Service. Certified in accordance with Federal Aviation Regulation (FAR) Parts 121 and 127.

AIR ROUTE TRAFFIC CONTROL CENTER (ARTCC). A facility established to provide air traffic control service to an aircraft operating on an IFR flight plan within controlled airspace and principally during the enroute phase of flight.

AIR TAXI. An air carrier certificated in accordance with FAR Part 135 and authorized to provide, on demand, public transportation of persons and property by aircraft. Generally operates small aircraft for hire for specific trips.

AIRCRAFT. An aircraft is a device that is used or intended to be used for flight in the air.

AIRCRAFT APPROACH CATEGORY. A grouping of aircraft based on 1.3 times the stall speed in their maximum certificated landing weight. The categories are as follows:

- Category A: Speed less than 91 knots.
- Category B: Speed 91 knots or more, but less than 121 knots.
- Category C: Speed 121 knots or more, but less than 141 knots.
- Category D: Speed 141 knots or more, but less that 166 knots.
- Category E: Speed greater than 166 knots.

AIRPLANE. Means an engine-driven fixed-wing aircraft heavier than air that is supported in flight by the dynamic reaction of the air against its wings.

AIRPLANE DESIGN GROUP (ADG). A grouping of aircraft based upon relative wingspan or tail height (whichever is most demanding). The groups are as follows:

Group	Tail Height (ft)	Wingspan (ft)
1	<20	<49
II	20 - <30	49 - <79
III	30 - <45	79 - <118
IV	45 - <60	118 - <171
V	60 - <66	171 - <214
VI	66 - <80	214 - <262

AIRPORT. An airport is an area of land or water that is used or intended to be used for the landing and takeoff of aircraft, and includes its buildings and facilities, if any.

AIRPORT ELEVATION. The highest point on an airport's usable runway expressed in feet above mean sea level (MSL).

AIRPORT LAYOUT DRAWING (ALD). The drawing of the airport showing the layout of existing and proposed airport facilities.

AIRPORT REFERENCE CODE (ARC). A coding system used to relate airport design criteria to the operational (Aircraft Approach Category) to the physical characteristics (Airplane Design Group) of the airplanes intended to operate at the airport.

AIRPORT REFERENCE POINT (ARP). The latitude and longitude of the approximate center of the airport.

AIRPORT TRAFFIC CONTROL TOWER (ATCT). A central operations facility in the terminal air traffic control system, consisting of a tower, including an associated instrument flight rule (IFR) room if radar equipped, using air/ground communications and/or radar, visual signaling, and other devices to provide safe and expeditious movement of terminal air traffic.

ALERT AREA. See special-use airspace.

ANNUAL INSTRUMENT APPROACH (AIA). An approach to an airport with the intent to land by an aircraft in accordance with an IFR flight plan when visibility is less than three miles and/or when the ceiling is at or below the minimum initial approach altitude.

APPROACH LIGHTING SYSTEM (ALS). An airport lighting facility, which provides visual guidance to landing aircraft by radiating light beams by which the pilot aligns the aircraft with the extended centerline of the runway on his/her final approach and landing.

APPROACH MINIMUMS. The altitude below which an aircraft may not descend while on an IFR approach unless the pilot has the runway in sight.

AUTOMATIC DIRECTION FINDER (ADF). An aircraft radio navigation system, which senses and indicates the direction to a non-directional radio beacon (NDB) ground transmitter.

AUTOMATED WEATHER OBSERVATION STATION (AWOS). Equipment used to automatically record weather conditions (i.e. cloud height, visibility, wind speed and direction, temperature, dew-point, etc.).

AUTOMATED TERMINAL INFORMATION SERVICE (ATIS). The continuous broadcast of recorded non-control information at towered airports. Information typically includes wind speed, direction and active runway.

AZIMUTH. Horizontal direction expressed as the angular distance between true north and the direction of a fixed point (as the observer's heading).

BASE LEG. A flight path at right angles to the landing runway off its approach end. The base leg normally extends from the downwind leg to the intersection of the extended runway centerline. See Traffic Pattern.

BEARING. The horizontal direction to or from any point, usually measured clockwise from true north or magnetic north.

BLAST FENCE. A barrier used to divert or dissipate jet blast or propeller wash.

BUILDING RESTRICTION LINE (BRL). A line that identifies suitable building area locations on the airport.

CIRCLING APPROACH. A maneuver initiated by the pilot to align the aircraft with the runway for landing when flying a predetermined circling instrument approach under IFR.

CLASS A AIRSPACE. See Controlled Airspace.

CLASS B AIRSPACE. See Controlled Airspace.

CLASS C AIRSPACE. See Controlled Airspace.

CLASS D AIRSPACE. See Controlled Airspace.

CLASS E AIRSPACE. See Controlled Airspace.

CLASS G AIRSPACE. See Controlled Airspace.

COMPASS LOCATOR (LOM). A low power, low/medium frequency radio-beacon installed in conjunction with the instrument landing system at one or two or the marker sites.

CONTROLLED AIRSPACE. Airspace of defined dimensions within which air traffic control services are provided to instrument flight rules (IFR) and visual flight rules (VFR) flights in accordance with the airspace classification. Controlled airspace in the United States is designated as follows.

CLASS A. The airspace from 18,000 feet mean sea level (MSL) up to but not including 60,000 MSL (flight level FL600).

CLASS B. Generally, the airspace from the surface to 10,000 feet MSL surrounding the nation's busiest airports. The configuration of Class B airspace is unique to each airport, but typically consists of two or more layers of airspace and is designed to contain all published instrument approach procedures to the

airport. An air traffic control clearance is required for all aircraft to operate in the area.

CLASS C. Generally, the airspace from the surface to 4,000 feet above the airport elevation (charted as MSL) surrounding those airports that have an operational control tower and radar approach and are served by a qualifying number of IFR operations or passenger enplanements. Although individually tailored for each airport, Class C airspace typically consists of a surface area with a five nautical miles (nm) radius and an outer area with a 10 nm radius that extends from 1,200 feet to 4,000 feet above the airport elevation. Two-way radio communication is required for all aircraft.

CLASS D. Generally, that airspace from the surface to 2,500 feet above the airport elevation (charted as MSL) surrounding those airports that have an operational control tower. Class D airspace is individually tailored and configured to encompass published instrument approach procedures. Unless otherwise authorized, all persons must establish two-way radio communications.

CLASS E. Generally, controlled airspace not classified as Class A, B, C or D. Class E airspace extends upward from either the surface or a designated altitude to the overlying or adjacent controlled airspace. When designated as a surface area, the airspace will be configured to contain all instrument procedures. Class E airspace encompasses all Victor Airways. Only aircraft following instrument flight rules are required to establish two-way radio communications with air traffic control.

CLASS G. Generally, that airspace not classified as Class A, B, C, D or E. Class G airspace extends from the surface to the overlying Class E airspace

CONTROLLED FIRING AREA. See special-use airspace.

CROSSWIND. Wind flow that is not parallel to the runway of the flight of an aircraft.

CROSSWIND LEG. A flight path at right angles to the landing runway off its upwind end. See Traffic Pattern.

DECLARED DISTANCES. The distances declared available for the airplane's takeoff run, takeoff distance, accelerate-stop distance and landing distance requirements. The distances are:

TAKEOFF RUN AVAILABLE (TORA). The runway length declared available and suitable for the ground run of an airplane taking off.

TAKEOFF DISTANCE AVAILABLE (TODA). The TORA plus the length of any remaining runway and/or clearway beyond the far end of the TORA.

ACCELERATE – STOP DISTANCE AVAILABLE (ASDA). The runway plus stopway length declared available for the acceleration and deceleration of an aircraft aborting a takeoff.

LANDING DISTANCE AVAILABLE (LDA). The runway length declared available and suitable for landing.

DISPLACED THRESHOLD. A threshold that is located at a point on the runway other than the designated beginning of the runway.

DISTANCE MEASURING EQUIPMENT (DME). Equipment (airborne and ground) used to measure, in nautical miles, the slant range distance of an aircraft from the DME navigational aid.

DNL. The 24-hour average sound level, in A-weighed decibels, obtained after the addition of ten decibels to sound levels for the periods between 10 pm and 7 am as averaged over a span of one year. It is the FAA standard metric for determining the cumulative exposure of individuals to noise.

DOWNWIND LEG. A flight path parallel to the landing runway in the direction opposite to landing. The downwind leg normally extends between the crosswind leg and the base leg. Also see Traffic Pattern.

EASEMENT. The legal right of one party to use a portion of the total rights in real estate owned by another party. This may include the right of passage over, on or below property; certain air rights above property, including view rights; and the rights to any specified form of development or activity, as well as any other legal rights in the property that may be specified in the easement document.

ENPLANED PASSENGERS. The total number of revenue passengers boarding aircraft, including originating, stop-over, and transfer passengers, in scheduled and non-scheduled services.

FINAL APPROACH. A flight path in the direction of landing along the extended runway centerline. The final approach normally extends from the base leg to the runway. See Traffic Pattern

FIXED BASE OPERATOR (FBO). An FBO typically offers the following services (or a combination thereof): aircraft charter operation, aircraft rental, aircraft storage, flight training, aircraft sales/leasing, aircraft component maintenance, aircraft parts sales, and aircraft maintenance.

FRANGIBLE NAVAID. A navigational aid which retains its structural integrity and stiffness up to a designated maximum load, but on impact from a greater load, breaks, distorts, or yields in such a manner as to present the minimum hazard to aircraft.

GENERAL AVIATION. That portion of civil aviation that encompasses all facets of aviation except air carriers holding a certificate of convenience and necessity, and large aircraft commercial operators.

GLIDE SLOPE (GS). Provides vertical guidance for aircraft during approach and landing. The glide slope consists of 1) electronic components emitting signals which provide vertical guidance by reference to airborne instruments during instrument approaches such as ILS; or 2) visual ground aids, such as VASI, which provide vertical guidance for VFR approach or for the visual portion of an instrument approach and landing.

GLOBAL POSITIONING SYSTEM (GPS). A system of 24 satellites used as reference points to enable navigators equipped with GPS receivers to determine their latitude, longitude and altitude.

HELIPAD. A designated area for the takeoff, landing and parking of helicopters.

HIGH-SPEED EXIT TAXIWAY. A long radius taxiway designed to expedite aircraft turning off the runway after land (at speeds up to 60 knots), thus reducing runway occupancy time.

INSTRUMENT APPROACH. A series of predetermined maneuvers for the orderly transfer of an aircraft under instrument flight conditions from the beginning of the initial approach to a landing or to a point from which a landing may be made visually.

INSTRUMENT FLIGHT RULES (IFR). Rules governing the procedures for conducting instrument flight. Also a term used by pilots and controllers to indicate type of flight plan.

INSTRUMENT LANDING SYSTEM (ILS). A precision instrument approach system, which normally consists of the following electronic components and visual aids: 1) localizer, 2) glide slope, 3) outer marker, 4) middle marker and 5) approach lights.

LANDING DISTANCE AVAILABLE (LDA). See declared distances.

LOCAL TRAFFIC. Aircraft operating in the traffic pattern or within site of the tower, or aircraft known to be departing or arriving from the local practice areas, or aircraft executing practice instrument approach procedures. Typically, this includes touch-and-go training operations.

LOCALIZER. The component of an ILS, which provides course guidance to the runway.

LOCALIZER TYPE DIRECTIONAL AID (LDA). A facility of comparable utility and accuracy to a localizer, but is not part of a complete ILS and is not aligned with the runway.

LORAN. Long range navigation, an electronic navigational aid which determines aircraft position and speed by measuring the difference in the time of reception of synchronized pulse signals from two fixed transmitters. Loran is used for enroute navigation.

MICROWAVE LANDING SYSTEM (MLS). An instrument approach and landing system that provides precision guidance in azimuth, elevation, and distance measurement.

MILITARY OPERATIONS AREA (MOA). See special-use airspace.

MISSED APPROACH COURSE (MAC). The flight route to be followed if, after an instrument approach, a landing is not effected, and occurring normally when the aircraft has descended to the decision height and has not established visual contact or when directed by air traffic control to pull up or to go around again.

MOVEMENT AREA. The runways, taxiways, and other areas of an airport which are utilized for taxiing/hover taxiing, air taxiing, takeoff, and landing of aircraft, exclusive of loading ramps and parking areas. At those airports with a tower, air traffic control clearance is required for entry onto the movement area.

NAVAID. A term used to describe any electrical or visual air navigational aid, light, sign, and associated supporting equipment.

NOISE CONTOUR. A continuous line on a map of the airport vicinity connecting all points of the same noise exposure level.

NONDIRECTIONAL BEACON (NDB). A beacon transmitting nondirectional signals whereby the pilot of an aircraft equipped with direction finding equipment can determine his/her bearing to and from the radio beacon and home on, or track to, the station. When the radio beacon is installed in conjunction with the Instrument Landing System marker, it is normally called a compass locator.

NONPRECISION APPROACH PROCEDURE. A standard instrument approach procedure in which no electronic glide slope is provided, such as VOR, TACAN, NDB or LOC.

OBJECT FREE AREA (OFA). An area on the ground centered on a runway, taxiway or taxilane centerline provided to enhance the safety of aircraft operations by having the area free of objects, except for objects that need to be located in the OFA for air navigation or aircraft ground maneuvering purposes.

OBSTACLE FREE ZONE (OFZ). The airspace below 150 feet above the established airport elevation and along the runway and extended runway centerline that is required to be kept clear of all objects, except for frangible visual NAVAIDs that need to be located in the OFZ because of their function, in order to provide clearance for aircraft landing or taking off from the runway, and for missed approaches.

OPERATION. A takeoff or landing.

OUTER MARKER (OM). An ILS navigation facility in the terminal area navigation system located four to seven miles from the runway edge on the extended centerline indicating to the pilot that he/she is passing over the facility and can begin final approach.

PRECISION APPROACH. A standard instrument approach procedure, which provides runway alignment and glide slope (descent) information. It is categorized as follows:

CATEGORY I. A precision approach which provides for approaches with a decision height of not less than 200 feet and visibility not less than ½ mile or Runway Visual Range (RVR) 2400 with operative touchdown zone and runway centerline lights.

CATEGORY II. A precision approach, which provides for approaches with a decision height of not less than 100 feet and visibility not less that 1200 feet RVR.

CATEGORY III. A precision approach, which provides for approaches with minima less than Category II.

PRECISION APPROACH PATH INDICATOR (PAPI). A lighting system providing visual approach slope guidance to aircraft during a landing approach. It is similar to a Visual Approach Slope Indicator (VASI) but provides a sharper transition between the colored indicator lights.

PRECISION OBJECT FREE ZONE (POFZ). An area centered on the extended runway centerline, beginning at the runway threshold and extending behind the runway threshold that is 200 feet long by 800 feet wide. The POFZ is a clearing standard, which requires the POFZ to be kept clear of above ground objects protruding above the runway safety area edge elevation (except for NAVAIDs). The POFZ applies to all new authorized instrument approach procedures with less than ¾ mile visibility.

PROHIBITED AREA. See special-use airspace.

REMOTE TRANSMITTER / RECEIVER (RTR). See remote communications outlet. RTRs serve ARTCCs.

RELIEVER AIRPORT. An airport to serve general aviation aircraft, which might otherwise use a congested air-carrier served airport.

RESTRICTED AREA. See special-use airspace.

RNAV. Area Navigation – airborne equipment, which permits flights over determined tracks within prescribed accuracy tolerances without the need to overfly ground-based navigation facilities. Used enroute and for approaches to an airport.

RUNWAY. A defined rectangular area on an airport prepared for an aircraft landing and taking off. Runways are normally numbered in relation to their magnetic direction, rounded off to the nearest 10 degrees. The runway heading on the opposite end of the runway is 180 degrees from that runway end. Aircraft can takeoff or land from either end of a runway, depending upon wind direction.

RUNWAY BLAST PAD. A surface adjacent to the ends of runways provided to reduce the erosive effect of jet blast and propeller wash.

RUNWAY END IDENTIFIER LIGHTS (REIL). Two synchronized flashing lights, one on each side of the runway threshold, which provide rapid and positive identification of the approach end of a particular runway.

RUNWAY GRADIENT. The average slope, measured in percent, between the two ends of a runway.

RUNWAY PROTECTION ZONE (RPZ). An area off the runway end to enhance the protection of people and property on the ground. The RPZ is trapezoidal in shape. Its dimensions are determined by the aircraft approach speed and runway approach type/minima.

RUNWAY SAFETY AREA (RSA). A defined surface surrounding the runway prepared or suitable for reducing the risk of damage to airplanes in the event of an undershoot, overshoot or excursion from the runway.

RUNWAY VISUAL RANGE (RVR). An instrumentally derived value, in feet, representing the horizontal distance a pilot can see down the runway from the runway end.

RUNWAY VISIBILITY ZONE (RVZ). An area on the airport to be kept clear of permanent objects so that there is an unobstructed line-of-site from any point five feet above the runway centerline to any point five feet above an intersecting runway centerline.

SEGMENTED CIRCLE. A system of visual indicators designed to provide traffic pattern information at airports without operating control towers.

SHOULDER. An area adjacent to the edge of paved runways, taxiways or aprons providing a transition between the pavement and the adjacent surface; support for aircraft running off the pavement; enhanced drainage; and blast protection. The shoulder does not necessarily need to be paved.

SLANT-RANGE DISTANCE. The straight line distance between an aircraft and a point on the ground.

SPECIAL USE AIRSPACE. Airspace of defined dimensions identified by a surface area wherein activities must be confined because of their nature and/or wherein limitations may be imposed upon aircraft operations that are not a part of those activities. Special-use airspace classifications include:

ALERT AREA. Airspace that may contain a high volume of pilot training activities or an unusual type of aerial activity, neither of which is hazardous to aircraft.

CONTROLLED FIRING AREA. Airspace wherein activities are conducted under conditions so controlled as to eliminate hazards to nonparticipating aircraft and to ensure the safety of persons or property on the ground.

MILITARY OPERATIONS AREA (MOA). Designated airspace with defined vertical and lateral dimensions established outside Class A airspace to separate/segregate certain military activities from instrument flight rule (IFR) traffic and to identify for visual flight rule (VFR) traffic where these activities are conducted.

PROHIBITED AREA. Designated airspace within which the flight of aircraft is prohibited.

RESTRICTED AREA. Airspace designated under FAR 73, within which the flight of aircraft, while not wholly prohibited, is subject to restriction. Most restricted areas are designated joint use. When not in use by the using agency, IFR/VFR operations can be authorized by the controlling air traffic control facility.

WARNING AREA. Airspace, which may contain hazards to nonparticipating aircraft.

STANDARD INSTRUMENT DEPARTURE (SID). A preplanned coded air traffic control IFR departure routing, preprinted for pilot use in graphic and textual form only.

STANDARD TERMINAL ARRIVAL (STAR). A preplanned coded air traffic control IFR arrival routing, preprinted for pilot use in graphic and textual or textual form only.

STOP-AND-GO. A procedure wherein an aircraft will land, make a complete stop of the runway, and then commence a takeoff from that point. A stop-and-go is recorded as two operations: one operations for the landing and one operations for the takeoff.

STOPWAY. An area beyond the takeoff runway, no less wide than the runway and centered on the extended centerline of the runway, able to support an airplane during an aborted takeoff, without causing structural damage to the airplane, and designated for use in decelerating the airplane during an aborted takeoff.

STRAIGHT-IN LANDING / APPROACH. A landing made on a runway aligned within 30 degrees of the final approach course following completion of an instrument approach.

TACTICAL AIR NAVIGATION (TACAN). An ultra-high frequency electronic air navigation system, which provides suitably-equipped aircraft a continuous indication of bearing and distance to the TACAN station.

TAKEOFF DISTANCE AVAILABLE (TODA). See declared distances.

TAKEOFF RUN AVAILABLE (TORA). See declared distances.

TAXILANE. The portion of the aircraft parking area used for access between taxiways and aircraft parking positions.

TAXIWAY. A defined path established for the taxiing of aircraft from one part of an airport to another.

TAXIWAY SAFETY AREA (TSA). A defined surface alongside the taxiway prepared or suitable for reducing the risk of damage to an airplane unintentionally departing the taxiway.

TETRAHEDRON. A device used as a landing indicator. The small end of the tetrahedron points in the direction of landing.

THRESHOLD. The beginning of that portion of the runway available for landing. In some instances the landing threshold may be displaced.

TOUCH-AND-GO. An operation by an aircraft that lands and departs on a runway without stopping or exiting the runway. A touch-and-go is recorded as two operations: one operation for the landing and one operation for the takeoff.

TOUCHDOWN ZONE (TDZ). The first 3,000 feet of the runway beginning at the threshold.

TOUCHDOWN ZONE ELEVATION (TDZE). The highest elevation in the touchdown zone.

TOUCHDOWN ZONE (TDZ) LIGHTING. Two rows of transverse light bars located symmetrically about the runway centerline normally at 100-foot intervals. The basic system extends 3,000 feet along the runway.

TRAFFIC PATTERN. The traffic flow that is prescribed for an aircraft landing or taking off from an airport. The components of a typical traffic pattern are the upwind leg, crosswind leg, downwind leg, and final approach.

UNICOM. A nongovernmental communication facility, which may provide airport information at certain airports. Locations and frequencies of UNICOMs are shown on aeronautical charts and publications.

UPWIND LEG. A flight path parallel to the landing runway in the direction of landing. See traffic pattern.

VECTOR. A heading issued to an aircraft to provide navigational guidance by radar.

VERY HIGH FREQUENCY / OMNIDIRECTIONAL RANGE STATION (VOR). A ground-based electronic navigation aid transmitting very high frequency navigation signals, 360 degrees in azimuth, oriented from magnetic north. Used as the basis for navigation in the national airspace system. The VOR periodically identifies itself by Morse code and may have an additional voice identification feature.

VERY HIGH FREQUENCY OMNIDIRECTIONAL RANGE STATION / TACTICAL AIR NAVIGATION (VORTAC). A navigation aid providing VOR azimuth, TACAN azimuth and TACAN distance-measuring equipment (DME) at one site.

VICTOR AIRWAY. A control area or portion thereof established in the form of a corridor, the centerline of which is defined by radio navigational aids.

VISUAL APPROACH. An approach wherein an aircraft on an IFR flight plan, operating in VFR conditions under the control on an air traffic control facility and having an air traffic control authorization, may proceed to the airport of destination in VFR conditions.

VISUAL APPROACH SLOPE INDICATOR (VASI). An airport lighting facility providing vertical visual approach slope guidance to aircraft during approach to landing by radiating a directional pattern of high-intensity red and white focused light beams, which indicate to the pilot whether or he or she is on path. Some airports serving large aircraft have three-bar VASIs that provide two visual guide paths to the same runway.

VISUAL FLIGHT RULES (VFR). Rules that govern the procedures for conducting flight under visual conditions. The term VFR is also used in the United States to indicate weather conditions that are equal to or greater than minimum VFR requirement. In addition, it is used by pilots and controllers to indicate type of flight plan.

WIDE AREA AUGMENTATION SYSTEM (WAAS). The Wide Area Augmentation System (WAAS) uses a system of ground stations to provide necessary augmentations to the GPS Standard Positioning Service (SPS) navigation signal. A network of precisely surveyed ground reference stations is strategically positioned across the country to collect GPS satellite data. Using this information, a message is developed to correct any signal errors.

WARNING AREA. See special-use airspace.

ACRONYMS / ABBREVIATIONS

AC. Advisory circular

ADF. Automatic direction finder

ADG. Airplane design group

AFSS. Automated flight service station

AGL. Above ground level

AIA. Annual instrument approach

AIP. Airport improvement program

ALS. Approach lighting system

ALSF-1. Standard 2,400-foot high-intensity approach lighting system with sequenced flashers (Cat I configuration)

ALSF-2. Standard 2,400-foot high-intensity approach lighting system with sequenced flashers (Cat II configuration)

APV. Instrument approach procedure with vertical guidance

ARC. Airport reference code

ARFF. Aircraft rescue and firefighting

ARP. Airport reference point

ARTCC. Air route traffic control center

ASDA. Accelerate-stop distance available

ASR. Airport surveillance radar

ASOS. Automated surface observation station

ATCT. Air traffic control tower

ATIS. Automated terminal information service

AVGAS. Aviation gasoline (typically 100 low lead (LL))

AWOS. Automated weather observation station

BRL. Building restriction line

CFR. Code of Federal Regulations

CIP. Capital improvement program

CPO. Community Planning Organization

DME. Distance measuring equipment

DNL. Day-night noise level

DWL. Runway weight bearing capacity for aircraft with dual wheels per strut

DTWL. Runway weight bearing capacity for aircraft with dual-tandem type landing gear

EAA. Experimental Aircraft Association

FAA. Federal Aviation Administration

FAM. Financial Aid to Municipalities

FAR. Federal Aviation Regulation

FBO. Fixed base operator

FY. Fiscal year

GA. General Aviation

GPS. Global positioning system

GS. Glide slope

HIRL. High-intensity runway edge lighting

IFR. Instrument flight rules

ILS. Instrument landing system

IM. Inner marker

LDA. Landing distance available

LIRL. Low-intensity runway edge lighting

LMM. Compass locator at middle marker

LOC. ILS localizer

LOM. Compass locator at ILS outer marker

LORAN. Long range navigation

MALS. Medium-intensity approach lighting system

MALSR. Medium-intensity approach lighting system with runway alignment indicator lights

MIRL. Medium-intensity runway edge lighting

MITL. Medium-intensity taxiway edge lighting

MLS. Microwave landing system

MM. Middle marker

MOA. Military operations area

MSL. Mean sea level

NAVAID. Navigational aid

NDB. Nondirectional radio beacon

NM. Nautical mile (6,076.1 feet)

NOTAM. Notice to airmen

NPIAS. National plan of integrated airport systems

NPRM. Notice of proposed rulemaking

ODA. Oregon Department of Aviation

ODALS. Omnidirectional approach lighting system

OFA. Object free area

OFZ. Object free zone

OM. Outer marker

OPA. Oregon Pilots Association

PAC. Project Advisory Committee

PAPI. Precision approach path indicator

PFC. Passenger facility charge

PCL. Pilot-controlled lighting

PLASI. Pulsating visual approach slope indicator

PMP. Pavement Maintenance Program

POFA. Precision object free area

PVASI. Pulsating/steady visual approach slope indicator

RCO. Remote communications outlet

REIL. Runway end identifier lights

RNAV. Area navigation

RPZ. Runway protection zone

RTR. Remote transmitter/receiver

RVR. Runway visibility range

RVZ. Runway visibility zone

SALS. Short approach lighting system

SASP. State Aviation System Plan

SEL. Sound exposure level

SID. Standard instrument departure

SM. Statute mile (5,280 feet)

SRE. Snow removal equipment

SSALF. Simplified short approach lighting system with sequenced flashers

SSALR. Simplified short approach lighting system with runway alignment indicator lights

STAR. Standard terminal arrival route

SWL. Runway weight bearing capacity for aircraft with single-wheel type landing gear

STWL. Runway weight bearing capacity for aircraft with single-wheel tandem type landing gear

TACAN. Tactical air navigation

TDZ. Touchdown zone

TDZE. Touchdown zone elevation

TAF. Terminal Area Forecast

TODA. Takeoff distance available

TORA. Takeoff run available

TRACON. Terminal radar approach control

VASI. Visual approach slope indicator

VFR. Visual flight rules

VHF. Very high frequency

VOR. Very high frequency omnidirectional range

VORTAC. VOR and TACAN collocated

WAAS. Wide Area Augmentation System

Appendix B:
FAA CORRESPONDENCE

Airport Master Plan Update

Aurora State Airport

U.S. Department
of Transportation
**Federal Aviation
Administration**

Northwest Mountain Region
Seattle Airports District Office
1601 Lind Avenue S.W., Suite 250
Renton, Washington 98057-3356

October 19, 2012

Mr. Mitch Swecker, Director
Oregon Dept. of Aviation
3040 25th Street, SE
Salem, OR 97302

Dear Mr. Swecker,

The Aurora State Airport Layout Plan (ALP) dated March, 2012 and submitted by WH Pacific, Inc., is hereby approved. A signed copy of the ALP is enclosed.

This approval considers only the safety, utility, and efficiency of the Aurora State Airport, and is conditioned on acknowledgment that any development on airport property requiring federal environmental approval must receive such written approval from the Federal Aviation Administration (FAA) prior to commencement of the subject development. This ALP approval is also conditioned on acceptance of the plan under local land use laws. We encourage appropriate agencies to adopt land use and height restrictive zoning based on the plan since action toward this end is a prerequisite of the Airport Improvement Program (AIP). Grant Assurance 21, Compatible Land Use, requires airport sponsors to take appropriate action, including the adoption of zoning laws to restrict the use of land adjacent to, or in the immediate vicinity of the airport, to activities and purposes compatible with normal airport operations including the arrival and departure of aircraft. The FAA recognizes residential development adjacent to the airport property as an incompatible land use.

Approval of the plan does not indicate that the United States will participate in the cost of any development proposed. When airport construction, alteration, or deactivation is undertaken, such action requires notification and review in accordance with the provisions of Part 77 and Part 157 of the Federal Aviation Regulations.

Please attach this letter to the approved Airport Layout Plan and retain it in the airport files for future use under the Airport Improvement Program.

Sincerely,

Carol A. Suomi
Manager, Seattle Airports District Office

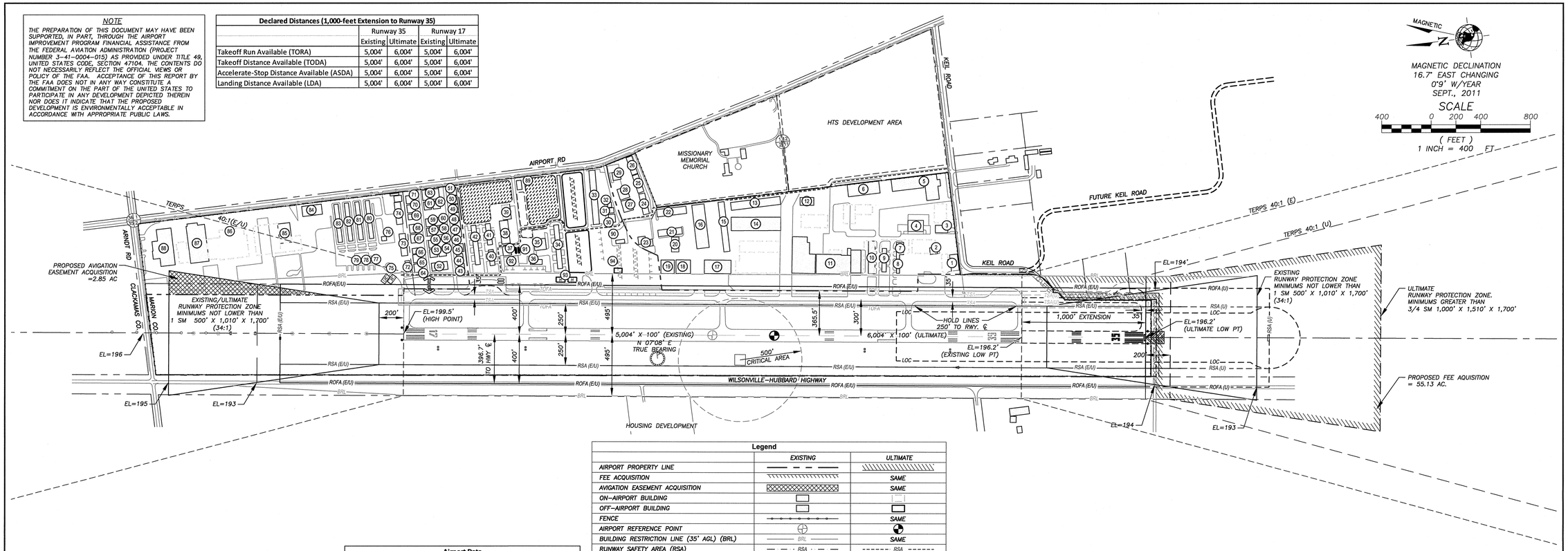
Encl: Aurora ALP dtd Mar 2012

cc:
Ms. Heather Peck, ODA
Mr. Rainse Anderson, WHP

NOTE

THE PREPARATION OF THIS DOCUMENT MAY HAVE BEEN SUPPORTED, IN PART, THROUGH THE AIRPORT IMPROVEMENT PROGRAM FINANCIAL ASSISTANCE FROM THE FEDERAL AVIATION ADMINISTRATION (PROJECT NUMBER 3-41-0004-015) AS PROVIDED UNDER TITLE 49, UNITED STATES CODE, SECTION 47104. THE CONTENTS DO NOT NECESSARILY REFLECT THE OFFICIAL VIEWS OR POLICY OF THE FAA. ACCEPTANCE OF THIS REPORT BY THE FAA DOES NOT IN ANY WAY CONSTITUTE A COMMITMENT ON THE PART OF THE UNITED STATES TO PARTICIPATE IN ANY DEVELOPMENT DEPICTED THEREIN NOR DOES IT INDICATE THAT THE PROPOSED DEVELOPMENT IS ENVIRONMENTALLY ACCEPTABLE IN ACCORDANCE WITH APPROPRIATE PUBLIC LAWS.

Declared Distances (1,000-feet Extension to Runway 35)				
	Runway 35		Runway 17	
	Existing	Ultimate	Existing	Ultimate
Takeoff Run Available (TORA)	5,004'	6,004'	5,004'	6,004'
Takeoff Distance Available (TODA)	5,004'	6,004'	5,004'	6,004'
Accelerate-Stop Distance Available (ASDA)	5,004'	6,004'	5,004'	6,004'
Landing Distance Available (LDA)	5,004'	6,004'	5,004'	6,004'



Legend		
	EXISTING	ULTIMATE
AIRPORT PROPERTY LINE		
FEE ACQUISITION		SAME
AVIGATION EASEMENT ACQUISITION		SAME
ON-AIRPORT BUILDING		
OFF-AIRPORT BUILDING		
FENCE		SAME
AIRPORT REFERENCE POINT		
BUILDING RESTRICTION LINE (35' AGL) (BRL)	BRL	SAME
RUNWAY SAFETY AREA (RSA)	RSA	RSA
RUNWAY OBJECT FREE AREA (ROFA)	ROFA	ROFA
RUNWAY PROTECTION ZONE (RPZ)		
EXTENDED RUNWAY CENTERLINE		SAME
DISPLACED THRESHOLD	N/A	
RUNWAY HOLDLINE		SAME
TAXIWAY SAFETY AREA (TSA)	TSA	TSA
TAXIWAY OBJECT FREE AREA (TOFA)	TOFA	TOFA
SERVICE ROAD	N/A	
HANGAR DEVELOPMENT AREA		SAME
APRON / TIEDOWN AREA		
WINDCONE & SEGMENTED CIRCLE		SAME
VASI		SAME
PAPI	N/A	
REIL		SAME
ODAL		
LOCALIZER		
LOCALIZER CRITICAL AREA	LOC	SAME
CARGO APRON	N/A	
PAVEMENT		
PAVEMENT REMOVAL		SAME
FUEL TANKS		
HELICOPTER PARKING	H	H
RESIDENTIAL THROUGH THE FENCE ACCESS (RTTF)		SAME

Airport Data		
	Existing	Ultimate
Airport Elevation (MSL)	199.5'	Same
Airport Reference Point (ARP)		
Latitude	45°14'54.085"N	45°14'44.758"N
Longitude	122°46'11.405"W	122°46'13.040"W
Mean Maximum Temperature	84°	Same
Airport Reference Code (ARC)	C-II	C-II
Airport Service Level	General Aviation	Same
Design Aircraft	IAI Astra 1125	Cessna Citation X

Runway 17/35 Data		
	Existing	Ultimate
Percent Effective Gradient	0.06%	Same
Percent Wind Coverage (10.5 kts)	98.93%	Same
Maximum Elevation Above MSL	199.5'	Same
Runway Length	5,004'	6,004'
Runway Width	100'	Same
Runway Surface Type	Asphalt	Same
Runway Strength (Dual Wheel Gear)	45,000 lbs	60,000 lbs
FAR Part 77 Approach Category		
Runway 17	C (NP)	Same
Runway 35	C (NP)	D (NP)
Approach Type	Nonprecision	Same
Runway 17	Not lower than 1 sm	Same
Runway 35	Not lower than 1 sm	Not lower than 3/4 sm
Approach Slope (Required / Clear)	34:1 / 34:1	Same
Runway Lighting	MIRL	Same
Runway Marking	Precision	Same
Taxiway Lighting	MITL / Reflectors	Same
Taxiway Marking	Standard	Same
Navigation Aids	LOC/DME, NDB	Same
Visual Aids	ODALS, VASI, REIL	ODALS, PAPI, REIL
Runway Safety Area Dimension	500' x 1,000' beyond rwy end	Same
Runway Object Free Area Dimension	800' x 1,000' beyond rwy end	Same
Runway Obstacle Free Zone (OFZ)	No OFZ Penetrations	Same
Runway End Coordinates		
Runway 17 Latitude	45°15'14.166"N	Same
Longitude	122°46'07.828"W	Same
Runway 35 Latitude	45°14'25.148"N	45°14'15.350"N
Longitude	122°46'16.515"W	122°46'18.251"W

Notes
Horizontal datum is NAD 1983, vertical datum is NAVD88.
The Airport is flat. Elevations / ground contours vary by less than 5 feet and are not shown. Drainage features are typically 2-3 feet lower than adjacent land.
Building restriction line is based on a 35-foot building located 495 feet from the runway centerline not penetrating FAR Part 77 surfaces for the Airport.
A Residential Through The Fence (RTTF) access exists at hangar #64 at the Wylee Condominium Association. The tenant is the resident caretaker for the airport.

Modifications to Standards		
	Standard Being Modified	Proposed Action
1	Advisory Circular (AC) 150/5300-13, para 307 (Runway Object Free Area)	The standard runway object free area (OFA) for Airport Reference Code C-II airports is 800 feet. Highway 551 runs north/south parallel to Runway 17/35; the approximate distance from the Runway 17/35 centerline to the Highway 551 centerline is 400 feet. As the airport geometry is not changing from the current condition, the Oregon Department of Aviation (ODA) requests a modification of the OFA design standard to allow the runway and highway to remain in their current positions.
2	AC 150/5300-13, Appendix 14 (Declared Distances)	The ODA requests the existing threshold for Runway 17 be referenced in determining FAR Part 77 surfaces and design standard surfaces referenced in AC 150/5300-13 (*i.e.*, RSA, RPZ, OFA, OFZ).

Airport Facilities and Buildings Legend				
Building No. Existing	Ultimate	Name / Owner	Use	Estimated Top Elevation (AGL)
1		Leased by Aurora Jet Center	Maintenance, Aircraft Storage	27'
2		Aurora Jet Center	Fixed Base Operator	22'
3		Private Southend Hangar	Aircraft Storage	19'
4		BPS Associates	Aircraft Storage	23'
5		Van's Aircraft	Business	30'
6		Artex	Business	26'
7, 8		Foxtrot Hangars / Southend Airpark	Aircraft Storage	21'
9		Hangar Row G / Southend Airpark	Aircraft Storage	13'
10		Hangar Row H / Southend Airpark	Business, Aircraft Storage	21'
11		Hangar India, Juliet & Kilo / Southend Airpark	Business, Aircraft Storage	38'
12		Winco	Business	29'
13		Hangar November / Southend Airpark	Business, Aircraft Storage	29'
14		Hangar Mike / Southend Airpark	Business, Aircraft Storage	31'
15 – 17		Airport Aviation Condo Association	Aircraft Storage	32'
18		Airport Aviation Condo Association	Aircraft Storage	32'
19		Aurora Aviation	Maintenance	26'
20 – 22		Airport Aviation Condo Association	Aircraft Storage	25'
23		Columbia Aviation Association	Clubhouse	21'

Airport Facilities and Buildings Legend				
Building No. Existing	Ultimate	Name / Owner	Use	Estimated Top Elevation (AGL)
24 – 26		Meridian Condos	Business	23'
27 – 29		Pacific Coast Aviation	Business	26'
30 – 33		Oregon Dept. of Aviation	Aircraft Storage	25'
34		Columbia Helicopters	Aircraft Storage	22'
35		Columbia Helicopters	Maintenance	28'
36		Aurora Aviation	Fixed Base Operator	16'
37		Pitts Hangar	Aircraft Storage	26'
38 – 42		Aurora Business Park	Aircraft Storage	25'
43 – 71		Wylee Condo Association	Aircraft Storage	27'
72		Civil Air Patrol Building	Aircraft Storage	26'
73		Sunset Helicopters	Business	26'
74		Aerometal	Business	27'
75		Willamette Aviation	Aircraft Fueling	7'
76		Willamette Aviation	Fixed Base Operator	12'
77 – 83		Willamette Aviation	Aircraft Storage	16'
84		Marlow Treit	Aircraft Storage	22'
85 – 88		Columbia Helicopters	Business	30'
89		Fire Suppression Tanks	Fire Suppression	12'
	90	Aurora Rural Fire Protection District	Emergency Response	TBD
	91	Aurora Aviation	Aircraft Fueling	16'
	92	Oregon Dept. of Aviation	Cargo Apron	N/A
	93	Oregon Dept. of Aviation	Helicopter Parking	N/A
	94	Oregon Dept. of Aviation	Air Traffic Control Tower	90'

WHPacific
9755 SW Barnes Rd, Suite 300
Portland, OR 97225
503-626-0455 Fax 503-526-0775
www.whpacific.com

OREGON DEPARTMENT OF AVIATION

APPROVAL BLOCK

OREGON DEPARTMENT OF AVIATION

SIGNATURE: [signature] TITLE: DIRECTOR DATE: 10/17/2012

FEDERAL AVIATION ADMINISTRATION

SIGNATURE: [signature] TITLE: Manager, Seattle ADO DATE: 10/18/12

APPROVAL LETTER DATED: See Letter dated 10/19/12

SHEET INFO	
DESIGNED	SML
DRAWN	RAI
CHECKED	REA
APPROVED	---
LAST EDIT	10/17/2012
PLOT DATE	6/28/2012
SUBMITTAL	

REVISIONS			
NO.	BY	DATE	REMARKS

AIRPORT LAYOUT PLAN DRAWING

OREGON DEPARTMENT OF AVIATION
AURORA STATE AIRPORT ~ MASTER PLAN UPDATE

PROJECT NUMBER	DRAWING FILE NAME	SCALE
034317	034317-XREF-MSTR-ALP	1"=400'

SHEET NUMBER 1

[DATE: 10/17/2012 9:23 AM] [AUTHOR: riwasaki] [PLOTTER: CutePDF Writer.pc3] [STYLE: WHP-Standard.ctb] [LAYOUT: Layout1]
[PATH: P:\Oregon Department of Aviation\034317\Design\Drawings\XRefs\034317-XREF-MSTR-ALP.dwg]

U.S. Department
of Transportation

**Federal Aviation
Administration**

Seattle Airports District Office
1601 Lind Avenue, S. W., Ste 250
Renton, Washington 98057-4056

June 7, 2011

Mr. Rainse Anderson
Director of Aviation
WH Pacific, Inc.
9755 SW Barnes Road, Suite 300
Portland, OR 97225

Dear Mr. Anderson:

This letter is in response to your e-mail of May 15, 2011, in which you requested clarification of the application of declared distances at the Aurora State Airport in Oregon. It is our understanding that although the current Master Plan study indicates that there are constrained operations that justify a runway extension, it recommends using declared distances as a way to gain limited operational use of new pavement because pursuing an extension would not be feasible due to the negative environmental and/or business related impacts.

The purpose of declared distances is described in Federal Aviation Administration Advisory Circular 150/5300-15 (Airport Design) Appendix 14, which states:
"The purpose of declared distances in airport design is to provide an equivalent runway safety area (RSA), runway object free area (ROFA), or runway protection zone (RPZ) in accordance with the design standards in Chapters 2 and 3 at existing constrained airports where it is otherwise impracticable to meet standards by other means. Declared distances are also employed when there are obstructions in the runway approaches and/or departure surface that are beyond the ability of the airport owner to remove and result in a displaced runway threshold or change in the departure end of the runway."

The Master Plan's Chapter 5 (Scenarios 1 & 2), proposes an alternative that adds pavement before newly displaced thresholds (thereby necessitating the application of declared distances) to meet the constrained operations of aircraft; however, it does not consider this additional pavement as a runway extension. Upon careful review of these proposals, our determination is that these pavement extensions are in fact limited use runway extensions despite the application of declared distances. A rule of thumb is that; ***anything that increases the takeoff run available from the existing total runway length is a runway extension***.

In summary, we would not participate in funding proposals that would provide only partial and/or limited use of a runway extension.

If you have any other questions, please contact Bruce Fisher at 425.227.2649 or me at: 425.227.2657.

Sincerely,

Carolyn T. Read
Acting Manager, Seattle Airport District Office

Cc: Mr. Mitch Swecker, Oregon Dept of Aviation

Lucas, Sarah

Subject: Aurora State Airport-Master Plan
Attachments: Aurora Scenario #1.pdf; Aurora Scenario #2.pdf

From: Anderson, Rainse
Sent: Friday, May 13, 2011 1:33 PM
To: Bruce.Fisher@faa.gov; Stan.Allison@faa.gov
Cc: Mark Gardiner; SWECKER Mitch T * ODA; chris.corich@portofportland.com; LARSEN Sandra * ODA; Lucas, Sarah; Anderson, Rainse; WILSON John P * ODA
Subject: Aurora State Airport-Master Plan

Bruce/Stan,

The Aurora State Airport Preferred Alternative public comments were gathered until April 21, and were then discussed by the Oregon Aviation Board on April 28. As you will recall, a runway extension was shown to be justified in prior chapters of the Master Plan Update. However, a runway extension was not included in the proposed Preferred Alternative for several reasons. As a result of the comments given (available here), we have developed two additional scenarios that utilize displaced thresholds to gain takeoff length available in an attempt to "meet in the middle" of the airport user safety needs and community concerns. The scenarios are as such (drawings attached):

Scenario #1
Add 600-feet displaced threshold to Runway 35 and 200-feet displaced threshold to Runway 17 to acquire the following declared distances.

Scenario #1 Declared Distances		
	R35	R17
Takeoff Run Available (TORA)	5,604'	5,204'
Takeoff Distance Available (TODA)	5,604'	5,204'
Accelerate-Stop Distance Available (ASDA)	5,804'	5,804'
Landing Distance Available (LDA)	5,004'	5,004'

Scenario #2
Add 800-feet displaced threshold to Runway 17 to achieve the following declared distances.

Scenario #2 Declared Distances		
	R35	R17
Takeoff Run Available (TORA)	5,004'	5,804'
Takeoff Distance Available (TODA)	5,004'	5,804'
Accelerate-Stop Distance Available (ASDA)	5,804'	5,804'
Landing Distance Available (LDA)	5,004'	5,004'

As we have discussed the scenarios internally, and with ODA, we recognize there are (at least) two separate issues from FAA's perspective. The first issue relates to the technical application of the declared distances and the second is in regards to funding such projects. At this time we are concerned with the technical issues and wish to defer the funding issue to a later time, if needed.

Specifically, the technical concerns we have relate to the TERPS and Part 77 surfaces and how they would be applied at the Airport. Per our understanding of the RSA, OFA, and RPZ we believe these surfaces will be located in relation to the threshold (not end of pavement).

As for the departure/TERPS surface, AC 150/5300-13 Appendix 2, Figure A2-3, states "Surface (TERPS) starts at end of clear way if one is in place." Would the pavement behind the threshold be considered a “clearway” at Aurora? If we do not have to designate the pavement as a clearway to leave the departure surface in its current location this would be desirable. Moving the surface would create impacts to Columbia Helicopters’ future expansion plans.

As for Part 77 surfaces, we read AC 150/5300-13 Appendix 14, Para 1.b, that states "Where declared distances differ, the primary surface extends 200 feet beyond each end of the runway or the far end of each TODA, whichever is further, to protect departures to the extent of the 14 CFR Part 77 approach surface for that runway end.” So it is our interpretation that the primary surface would be relative to the paved surface, rather than the threshold, even if that portion of the pavement were only available for takeoff and not landing (*i.e.*, approach surface). Correct?

Additionally, while running the AFTIL simulation labs last week, a 1,000’ extension to the south was modeled – as you know. This was done to preserve the ability to extend the runway in the future. While an extension of pavement to the north was not modeled, given the topography and building layout at the Airport, it is not anticipated there would be any issues with tower cab visibility.

The use of declared distances at Aurora, while perhaps unconventional, is an attempt on our behalf to provide a viable airport that meets user needs and still be neighborly. Controversy over any true runway extension would likely thwart the environmental process, and we have good reason to believe it would be challenged on a legal basis for violation of Oregon’s Statewide Planning Goals (farmland protection). From responses given by operators, it is clear a longer runway is justified at Aurora. While the declared distances would not fully utilize the runway in all directions, it is a compromise that adds substantial operational value and safety for the constrained business jets while not impacting the existing businesses development plans by changing approach and departure surfaces. The Oregon Aviation Board views this option favorably as an agreeable solution to the challenges presented.

In closing, we look forward to FAA’s official position on the application of declared distances at the Aurora State Airport and clarification of the technical issues associated with them. Mitch Swecker, ODA, will be at your office on May 18-19. It is my hope that you will be able to discuss this letter with your colleagues prior to that date and to arrange an in-person meeting May 18.

Please contact me if you have any questions.

Regards,
Rainse

Rainse Anderson
Director of Aviation

WHPacific
9755 SW Barnes Rd, Ste 300 | Portland, OR 97225
D 503.372.3521 | M 971.235.3818 | F 503.526.0775
Enhancing communities through creative, exceptional service

U.S. Department
of Transportation

**Federal Aviation
Administration**

Seattle Airports District Office
1601 Lind Avenue, S. W., Ste 250
Renton, Washington 98055-4056

29 September, 2010

RECEIVED
OCT 04 2010
WHPACIFIC

Mr. Doug Hedlund
Director, Oregon Department of Aviation
3040 25th Street, SE
Salem, OR 97302

Dear Mr. Hedlund:

Airport Improvement Program (AIP) Project Number 3-41-0004-015
Approval of Activity Forecasts – Aurora State Airport Master Plan Update

I have reviewed Chapter 3 of the Airport Master Plan Update submitted by Mr. Rainse Anderson of WH Pacific, Inc.

I find adequate justification exists for the figures cited in the Forecasts of Aviation Activity and hereby approve the Forecast Summary. This chapter appears to be well-done and I believe that you and your Consultant(s) are off to a good start.

If you have any questions, please feel free to contact me at: 425.227.2649 or by e-mail at: bruce.fisher@faa.gov.

Sincerely,

Bruce C. Fisher
Airport Planner, Oregon / Idaho

cc: Mr. Rainse Anderson

Appendix C: AIRPORT USER SURVEY

Airport Master Plan Update

Aurora State Airport

WHPacific
OREGON DEPARTMENT OF AVIATION

Aurora State Airport User Survey
Survey Summary
July 2010

Background

In the fall of 2009, The Oregon Department of Aviation began the process of updating the 2000 Aurora State Airport Master Plan. The Airport Master Plan is ten years old and needs to be updated to reflect new facilities, current projections of airport activity, new environmental and other regulatory constraints, and to plan for future use of the airport.

To support this process, the Oregon Department of Aviation conducted a survey as part of the project kick-off in October 2009. The survey asked airport users and interested parties about their aircraft and airport use and suggestions for improvements. The following is a summary of their responses. An appendix of all responses is also available.

In total, 61 people responded to the survey. 31 of these respondents completed the survey online and 30 mailed or faxed in hard copies to the project team.

Aircraft Use and Landings

Aircraft Use
The survey asked respondents to indicate whether they own or fly an aircraft. 49 respondents indicated that they do own or fly an aircraft and 12 respondents indicated that they do not.
(All participants answered this question)

The responses below are classified by Aircraft Reference Code (ARC). The ARC is commonly used to group similar aircraft, and is represented by a letter designation and Roman numeral. The letter designation (A, B, C, etc.) is the aircraft approach category, which is representative of the aircraft's approach speed. The Roman numeral (I, II, III, etc.) represents the airplane design group and is determined by physical characteristics of the airplane (either wingspan or tail height, whichever is most demanding). Below is a table showing the number of responses by ARC, along with aircraft representative of each ARC.

ARC	Approach Speed (Aircraft Approach Category)	Airplane Design Group (Wingspan / Tail Height)	Representative Aircraft	Number of Responses
A-I	< 91 knots	< 49' / < 20'	Cessna 172	54
A-II	< 91 knots	49'-79' / 20'-30'	Pilatus PC-12	3
B-I	91-121 knots	< 49' / < 20'	Lear Jet 45	3
B-II	91-121 knots	49-79' / 20'-30'	Beechcraft King Air 200	10
-	-	-	Helicopter	10
-	-	-	Aircraft with Unknown ARCs	6
			Total	86

The appendix has a full listing of aircraft types reported by respondents.

Annual Landings
Respondents estimated their annual number of landings, including touch and go landings.
(51 participants answered this question.)

The table below summarizes their responses:

Range of estimated annual landings	Number of responses
None	4 responses
17-50	7 responses
55-80	9 responses
100-190	9 responses
200-300	14 responses
350-450	3 responses
500-600	2 responses
2000	2 responses

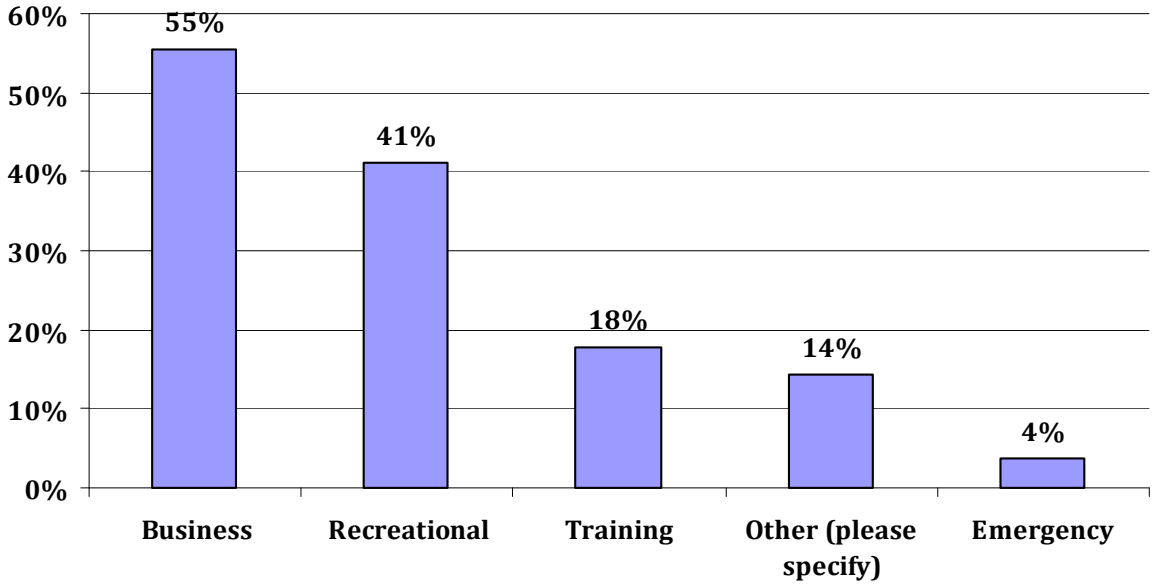
Respondents estimated the percentage of annual landings made at Aurora State Airport. *(53 participants answered this question.)*

Estimated percentage of annual landings at Aurora State Airport	Number of responses *(total)*	Number of responses *(for participants who answered that their aircraft is based at Aurora State Airport)*	Number of responses *(for participants who answered that their aircraft is NOT based at Aurora State Airport or do not own an aircraft)*
0%	4	0	4
2-5%	5	0	5
10%	1	1	0
20-29%	4	0	4
30-45%	10	9	1
50%	10	7	2
60-75%	10	8	3
80-90%	4	4	0
100%	2	1	1

Primary use of Aurora State Airport

Respondents indicated how they primarily use the airport. Over 55% of participants use the airport for business purposes. *56 participants responded to this question.*

How do you primarily use the Aurora State Airport?



Eight respondents indicated that they have an "other" primary use for the airport. The following other uses were listed:

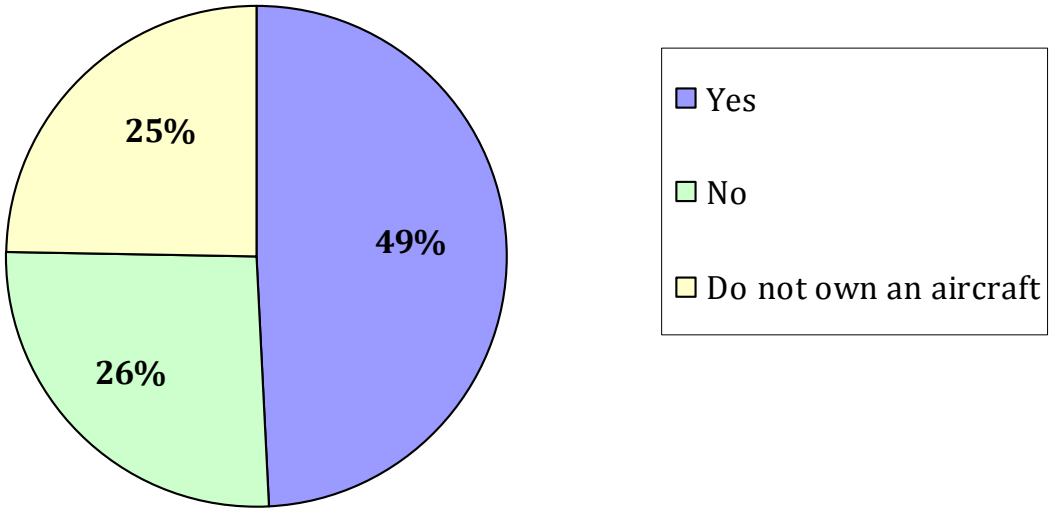
- Personal transportation/personal travel *(4 responses)*
- I live by the airport but I do not fly *(2 responses)*
- Telephone/ Broadband utility company *(1 response)*
- Volunteer *(1 response)*

Aircraft Base and Leasing

Aircraft Base

Respondents indicated whether their aircraft is based at Aurora State Airport. 49% indicated that their aircraft is based at Aurora State Airport, 26% said no, and 25% indicated that they do not own an aircraft.
(All participants responded to this question.)

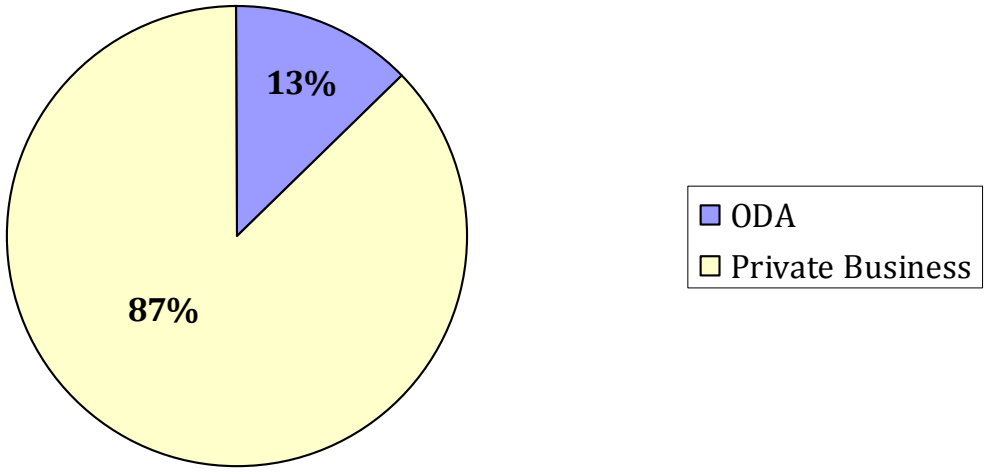
Is your aircraft based at Aurora State Airport?



Aircraft Storage and Tie-down

Those participants that do keep an aircraft at the Aurora State Airport indicated whether they lease or rent aircraft storage or tie-down from the Oregon Department of Aviation or from a private business. 87% indicated that they lease or rent from a private business. *(31 participants answered this question.)*

Do you lease or rent aircraft storage or tiedown from the Oregon Department of Aviation or from a private business?

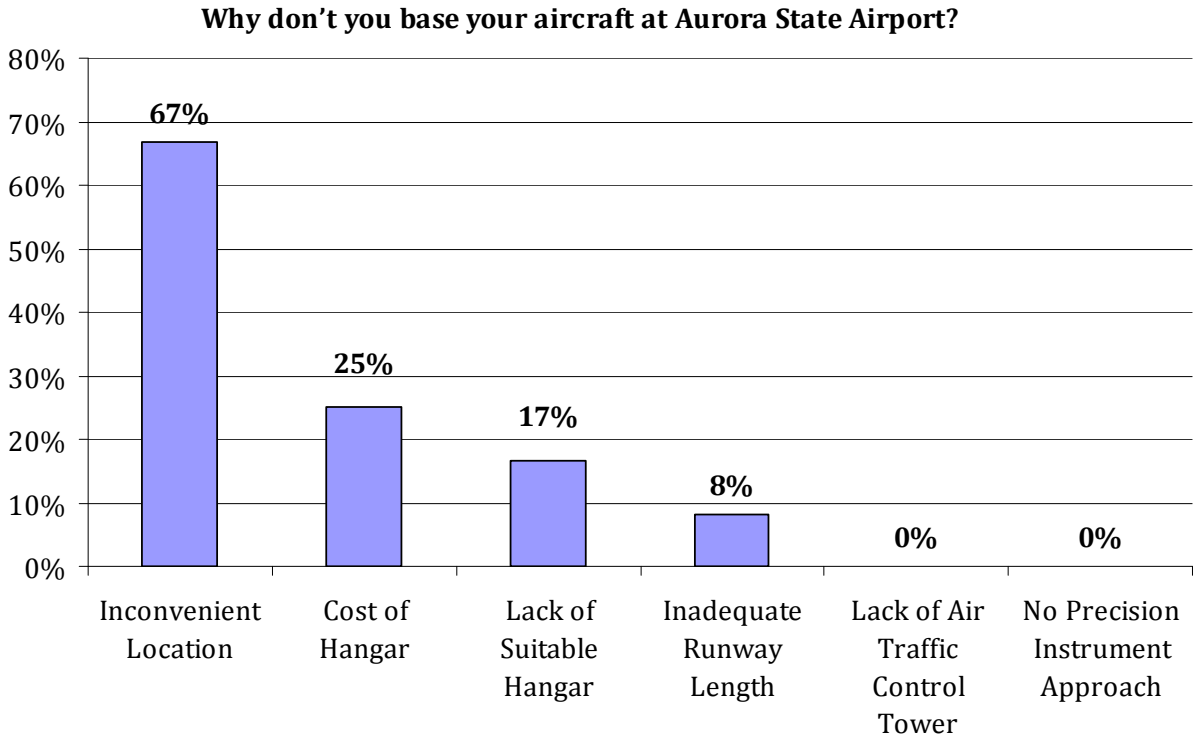


Aircraft based at other Airports
Those participants who do not keep an aircraft at the Aurora State Airport indicated where they base their aircraft.
(14 participants answered this question.)

The following airport codes were listed:

- Corvallis, OR (CVO) (2 respondents)
- Hubbard, OR (Lenhardt Airpark) (7S9) (2 respondents)
- Troutdale, OR (TTD) (2 respondents)
- Medford, OR (MFR)
- La Grande, OR (LGD)
- Newburg, OR (Sportsman Airpark) (2S6)
- Sunset Airpark
- Hillsboro, OR (Stark's Twin Oak) (7S3)
- Scappoose, OR (SPB)
- San Jose, CA (SJC)
- Eugene, OR (EUG)
- Salem, OR (SLE)

Those participants who do not keep an aircraft at the Aurora State Airport indicated why they do not base their aircraft there. Most cited inconvenient location.
(12 participants answered this question.)



Four participants left other responses:

- In the process of building a 135,000 square foot hangar in property adjacent to airport
- Aircraft are conveniently based at my home airport (2 responses)
- Based in Eugene (BIZ)

Airport Improvements

Respondents were asked to provide suggestions for improving Aurora State Airport. *(50 participants responded to this question.)*

The most commonly suggested improvements were the following:

- Build a control tower. (25 comments)
  - 25 respondents commented that a control tower is the most needed improvement. Six of these noted that a control tower is needed for safety and three thought that it would help with noise abatement. One person added that a control tower could reduce conflicts in IFR/VFR traffic.
- Lengthen runway. (14 comments)
  - 14 respondents suggested lengthening the runway. Two suggested adding 1,000 ft to the existing length, and two suggested a 6,000-foot length.
- Add precision instrument ILS approach. (10 comments)

  - Ten participants suggested a precision instrument ILS approach. One noted that this would help with the problem of fog, and another added that an ILS approach could reduce the chance of accidents.
- Change calm wind runway back to R17. (9 comments)
  - Nine participants suggested changing the calm wind runway back to R17. Two noted that the current calm wind designation of R35 creates a safety conflict.
- Improve airport roads and address traffic issues. (8 comments)
  - Eight respondents suggested various improvements to the airport internal roads and traffic issues. Three suggested general airport road improvements for safety. One said that traffic issues on Airport Road are a concern. One said there is too much hangar construction at Southend airpark. One suggested relocating Keil, as it is a dangerous road. One suggested changing Ehlen Road and Highway 515.
- Provide public sewer and water facilities. (6 comments)
  - Six participants suggested connecting the airport to City of Aurora sewer and water facilities.
- Add a restaurant or café. (4 comments)
  - Four respondents suggested adding a restaurant or café. One suggested using Nampa, ID or Caldwell, ID as an example.
- Lower approach minimums. (3 comments)
  - Three participants suggested lowering minimums. One suggested clearing obstacles to meet TERPS requirement for lower RNAV (GPS) approach minimums.
- Do not build a control tower. (3 comments)
  - Three people commented that a control tower should not be built. One noted that a control tower would not be cost effective.
- Consider the neighborhood in planning. (3 comments)
  - One person who lives near the Aurora State Airport commented that large jet planes make too much noise, and would like to see only smaller aircraft at the airport. One asked that local neighbors be informed of this process and results. A third suggested using design and building standards in the planning process that enhance the neighborhood.
- Get radar coverage/radar approach in the area. (2 comments)
- Improve lighting and install approach path lighting on Runway 35. (2 comments)

The following lists some other suggestions made by respondents. A full list of comments can be found in the appendix.

- Add run-up areas for safety.
- Add commercial service.
- Begin the master planning project by developing a vision statement.
- Allow for more developable land inside of Keil Road, Airport Way, Hwy 515, and Arndt Road.

- Get controlled airspace.
- Support ancillary airport and flight business.
- Provide better non-aircraft access.
- Increase hangar lease locations for new construction.
- Have an area for grass landings.
- Glideslope.
- Add mufflers and reduce noise.
- Provide lower cost hangars.
- The bigger taxiways were a great addition.
- Acquire land surrounding airport for future growth.
- The single runway is close to the maximum traffic possible. Lengthening a single runway or adding a tower will not solve this problem.
- Change nothing at all; the airport has all I need.
- May acquire large aircraft, would like to see increased weight restriction on runway (65,000 lb) to match taxiway.
- Need jet maintenance.
- Provide better control of entry of helicopter traffic.

Aurora State Airport User Survey
Appendix of All Responses
July 2010

This appendix includes all questions asked on the Aurora State Airport User Survey and all responses received.

Question# 1: What zip code do you live in?

61 total responses:

- 97225
- 97008
- 97002
- 97002
- 97035
- 97013
- 97002
- 97002
- 97202
- 97045
- 97140
- 97002
- 97062
- 97002
- 97333
- 97013
- 97055
- 97035
- 97223
- 970710
- 97068
- 97032
- 97219
- 97070
- 97034
- 97002
- 97002
- 97002
- 97224
- 97002
- 97124
- 97080
- 97035
- 97007
- 97070
- 97229
- 97013
- 95110
- 97002
- 97212
- 97002
- 97002
- 97013
- 98662
- 97402
- 97013
- 97070
- 97032
- 97013
- 97392
- 98607
- 97013
- 97224
- 97002
- 97002
- 97062
- 97002
- 97034
- 97140
- 97002
- 98664

Question# 2: Do you own or fly an aircraft? If so, list model/type of aircraft.

61 total responses:

- No 12 responses
- Yes 49 responses

The 49 respondents that answered "yes" provided the following model/type of aircraft:

- Beechcraft King Air (BE-200)
- Cessna P210 Centurion
- Piper J3, Cessna 180, Cessna T210, Cessna 310, Aero Commander 680V
- Cessna 172
- Beechcraft Bonanza F33A
- Single engine
- Beechcraft P-35 Bonanza
- Large Sikorsky and Bell Type I Helicopters
- Piper Arrow
- PA-30 Piper Twin Comanche
- Cessna 172
- Aviat Husky
- Piper Aztec
- Piper PA-32-300
- Globe Swift
- Cessna 182RG
- Cessna 205, J-4a Cub, 415d Ercoupe, N3N-3 navy
- Cessna TR182
- Piper Comanche
- Van's RV-4, Van's RV-10, Van's RV-12
- Van's Aircraft RV-6, 7, 7A, 8, 8A, 9A, 10, 12; Own RV-7A
- Van's RV-6
- RV-9A
- V35-B Bonanza
- PA45 Piper Malibu and XLZ Liberty
- Cessna 172 SP
- Astra 1125/G100
- Cessna 205, J-4a CUB, N3N-3 Navy, Cessna 414
- Mooney M20F
- EC-135 Helicopter, AS350 B3 Helicopter
- Cessna 140 and Cessna 182
- Cessna Citation 560XL
- Single engine and multi-land
- IA 1125 Astra, SR-22 Cirrus
- Cessna Citation XL
- Pilatus PC-12/47E
- Cessna 18L
- Cessna 400TT
- Cessna 550, PAY2, Beechcraft King Air (BE-200)
- Lear Jet 45
- 6X Helo MD500E, King Air C90GTi, King Air B350
- Pilatus PC-12
- DeHavilland Beaver N56TM, DeHavilland Tiger Moth N82TM, Cessna 185 N84TM, J3-Cub N3TM
- Cessna Citation
- RV-8
- Beechcraft King Air (BE-200)
- Beech Debonair
- Beechcraft King Air (BE-200), Cessna 172, Cessna 152
- Falcon F-900
- Pilatus PC-12

Question# 3: Estimate your number of annual landings. (Include Touch & Go)

51 total responses:

- 500
- 0
- 0
- 0
- 17
- None
- 300
- 120
- 200
- 100
- 30
- 25 to 30 local landings
- 100
- 200

- 30
- 75
- 20
- 150
- 75
- 100
- 120
- 75
- 450
- 200-250
- 300
- 50
- 200
- 300
- 30-35
- 190
- 80
- 2000
- 60
- 250
- hundreds
- 500-600
- 200
- 200
- 75
- 250
- 350
- 250
- 5000
- 175
- 250
- 150
- 80
- 60
- 350
- 300
- 55

Question# 4: What percent of your annual landings are at Aurora State Airport?

53 total responses:

- 2
- 0
- 0
- 0
- 02/03/2010
- None
- 80
- 90
- 70%
- 60
- OR
- 100% of the local landings
- 50
- 40%
- 65
- 50
- 50
- 40%
- 50%
- 75
- 50
- 60
- 25
- 150
- 35-40
- 5
- 25
- 50
- 5
- 40
- 26
- 50
- 2
- 30
- 70
- 45
- 100
- 25
- 30
- 50
- 80
- 75
- 5
- 30
- 10
- 35
- 75
- 50
- 60
- 50
- 60
- 30
- 80

Question# 5: How do you primarily use the Aurora State Airport?

56 total responses:

- Business 31 responses
- Recreational 23 responses
- Training 10 responses
- Other (please specify) 8 responses
- Emergency 2 responses

Those that responded "Other" specified the following:

- I live by the airport I do not fly
- Telephone/ Broadband utility company
- Volunteer
- Personal transportation
- transportation
- don't I live in the neighborhood
- Personal transportation
- Personal travel

Question# 6: Is your aircraft based at Aurora State Airport?

61 total responses

- Yes 30 responses
- No 16 responses
- Do not own an aircraft 15 responses

Question# 7: Do you lease or rent aircraft storage or tiedown from the Oregon Department of Aviation or from a private business?

31 total responses:

- ODA 4 responses
- Private Businesses 27 responses

Question# 8: Where is your aircraft based? (List Airport ID)

14 total responses:

- Corvallis, OR (CVO) (2 respondents)
- Hubbard, OR (Lenhardt Airpark) (7S9) (2 respondents)
- Troutdale, OR (TTD) (2 respondents)
- Medford, OR (MFR)
- La Grande, OR (LGD)
- Newburg, OR (Sportsman Airpark) (2S6)
- Sunset Airpark
- Hillsboro, OR (Stark's Twin Oak) (7S3)
- Scappoose, OR (SPB)
- San Jose, CA (SJC)
- Eugene, OR (EUG)
- Salem, OR (SLE)

Question# 9: Why don't you base your aircraft at Aurora State Airport? (Select all that apply.)

12 total responses:

- Inconvenient Location 8 responses
- Cost of Hangar 3 responses
- Lack of Suitable Hangar 2 responses
- Inadequate Runway Length 1 responses
- Lack of Air Traffic Control Tower 0 responses
- No Precision Instrument Approach 0 responses
- Other (please specify) 4 responses

Those that answered "other" specified the following:

- In the process of building a 135,000 square foot hangar in property adjacent to airport
- Aircraft are conveniently based at my airport home
- TTD is closer to home
- Based in Eugene (BIZ)

Question# 10: What suggestions do you have for improving Aurora State Airport?

50 total responses:

- Add commercial service

- I have lived here since 1976. I am NOT for any growth in the Aurora airport. The larger jet planes make too much noise on take off and landing as they pass over my home. I would like to see the larger jets minimized. The smaller aircraft are not an issue with me. Only the noisy larger jets.
- Traffic issues on Airport Road are a concern.
- Begin the master planning project by developing a vision statement. Connect to City of Aurora utilities. Get a restaurant. Allow for more developable land inside of Keil road, airport way, HWY 51, and Arndt Rd. Get controlled Airspace, get radar coverage in the area. Give John Wilson a raise.
- Support ancillary airport and flight business
- Control Tower for safety and noise abatement, better non-aircraft access
- tower and run-up areas for safety
- We need a restaurant at the airport and the associated infrastructure (sewer, etc) to support it.
- Increase hangar lease locations for new construction.
- 1. Install a new aircraft central tower to control landing. 2. Provide city water and sewer facilities
- First on my list is the need for a control tower.
- Run-up area runway 17. Clear obstacles to meet TERPS requirement for lower RNAV (GPS) approach minimums. Install approach path lighting on runway 35.
- Control tower as soon as you can get it.
- Needs Control tower
- Have a area for grass landings
- Glideslope and control tower
- Mufflers, noise reduction. Also, please inform the local neighbors or let them know what is going on.
- Go back to calm runway 17. the current 35 creates a safety conflict with actual IFR breakouts into VFR and ditto for training IFR in VFR conditions
- Open a tower.
- Utilize better planning methods for building and site development. Have design and building standards that enhance the neighborhood.
- Cafe/restaurant on field. Lower cost hangars.
- Do NOT add a control tower. The bigger taxiways were a great addition. At this time acquire land surrounding airport for future growth. Add a cafe (many people work here). Use Nampa, ID or Caldwell, ID as example.
- Nothing at all, has all I need.
- Do not put in tower - not cost effective. Calm wind runway should be 17. Run up area at 17 (should not have been put at 35).
- Precision instrument approach because of all the fog.
- Look forward to the new tower.
- Should increase runway length.
- For safety - change calm wind runway back to 17 (immediately). Provide for a proper 17 run-up area. Take into future planning consideration the fact that we have only a single runway which under normal economic conditions is close to the

maximum traffic possible now. A tower will not improve this restriction on growth, nor will the lengthening of the single runway solve the problem.

- Precision approach
- Add control tower to deconflict IFR/UFR traffic or eliminate/change instrument approaches to 17.
- Do not put a tower here. Change calm wind runway back to one seven.
- Put run-up area at one seven.
- Control tower. Lengthen runway, add 1000 feet. Precision ILS approach.
- Lengthen runway by 1,000 ft for one longer size. Private jets, Gulfstream, for training and business which would increase weight capacity. The need for a tower for safety.
- Increased runway length, ILS approach. We are limited by runway length at full fuel (24, 650 ft). May acquire large a/c, would like to see increased weight restriction on runway (65,000 ft) to match taxiway.
- A longer runway would be nice.
- There is too much hangar construction at Southend airpark with too limited taxi space.
- precision app, tower
- Tower, tower, tower. ILS
- Runway length increase, ILS
- Need longer runway and tower. Need jet maintenance.
- Get the tower built and operating ASAP
- Lengthen runway. Control tower.
- Need a control tower for safety and noise abatement. 6,000 foot runway. Lower minimums. Airport road improvements for safety. Public sewer and water.
- Control tower for safety and noise abatement. 6,000 foot runway. Lower minimums. Airport road improvements for safety. Public Sewer and water.
- Install tower
- Control Tower/radar approach. Relocate dangerous road on south end (Keil). Better control of entry of helicopter traffic. New ground transportation access. Changing Ehlen Rd and 515.
- With the increasing mix of GA and Jet aircraft, the probability of a mishap or accident is increasing accordingly. A tower and ILS approach could help.
- Lengthen and strengthen runway. Improve lighting, ILS, tower, interior road, public water and sewer systems
- Runway should be longer, tower, ILS system
- Control tower NEEDED. Longer runway (for safety).

Aurora State Airport User Survey

Aircraft and Airport Use Information

1. What zip code do you live in?

2. Do you own or fly an aircraft?

- ◯ No
- ◯ Yes (if so, list model/type of aircraft)

3. Estimate your number of annual landings. (Include Touch & Go)

4. What percent of your annual landings are at Aurora State Airport?

5. How do you primarily use the Aurora State Airport?

- ☐ Business
- ☐ Training
- ☐ Recreational
- ☐ Emergency
- ☐ Other (please specify)

*** 6. Is your aircraft based at Aurora State Airport?**

- ◯ Yes
- ◯ No
- ◯ Do not own an aircraft

Aircraft and Airport Use Information

*** 7. Do you lease or rent aircraft storage or tiedown from the Oregon Department of Aviation or from a private business?**

- ◯ ODA
- ◯ Private Business

Aircraft and Airport Use Information

Aurora State Airport User Survey

8. Where is your aircraft based? (List Airport ID)

9. Why don't you base your aircraft at Aurora State Airport? (Select all that apply.)

- [ ] Inadequate Runway Length
- [ ] Lack of Suitable Hangar
- [ ] Cost of Hangar
- [ ] Lack of Air Traffic Control Tower
- [ ] No Precision Instrument Approach
- [ ] Inconvenient Location

Other (please specify)

Improvements to Aurora State Airport

10. What suggestions do you have for improving Aurora State Airport?

Contact Informatioin

Providing contact information is optional.

If you provide your name, address, phone number, and email address, we will notify you of public meetings about the master plan and may contact you for more information related to the master plan update.

11. Contact Information

Name:
Mailing Address:
City:
State:
ZIP/Postal Code:
Email Address:
Phone Number:

Appendix D: INSTRUMENT APPROACH PROCEDURES

Airport Master Plan Update

Aurora State Airport

WHPacific
OREGON DEPARTMENT OF AVIATION

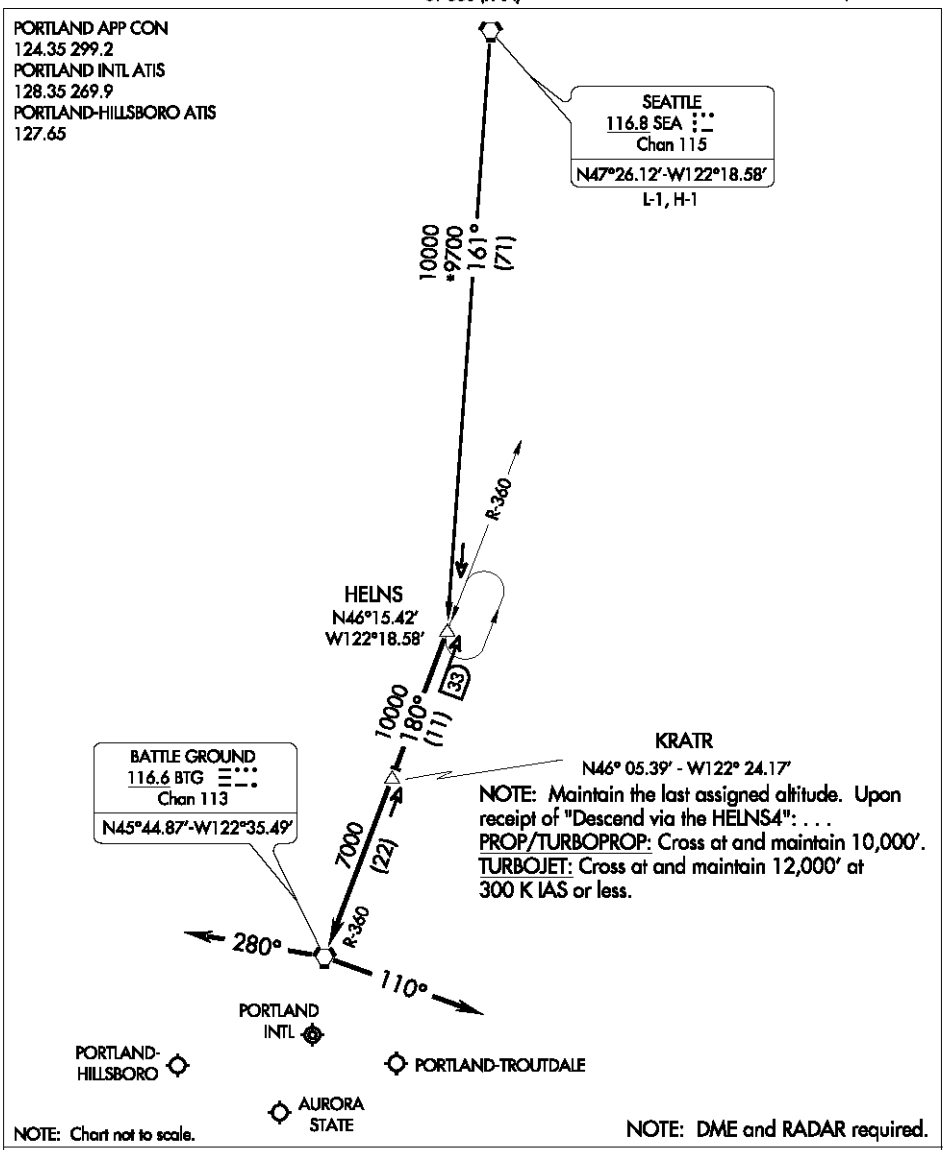
(HELNS.HELNS4) 03135

HELNS FOUR ARRIVAL

ST-330 (FAA)

PORTLAND, OREGON

NW-1, 29 JUL 2010 to 26 AUG 2010



SEATTLE TRANSITION (SEA.HELNS4): From over SEA VORTAC via SEA R-161 to HELNS DME FIX. Thence....
.... From over HELNS DME FIX via BTG R-360 to BTG VORTAC. Thence....
LANDING EAST: Depart BTG VORTAC heading 280° for vectors to final approach course.
LANDING WEST: Depart BTG VORTAC heading 110° for vectors to final approach course.

HELNS FOUR ARRIVAL
PORTLAND, OREGON
(HELNS.HELNS4) 03135

INSTRUMENT APPROACH PROCEDURE CHARTS

A IFR ALTERNATE AIRPORT MINIMUMS

Standard alternate minimums for non precision approaches are 800-2 (NDB, VOR, LOC, TACAN, LDA, VORTAC, VOR/DME, ASR or WAAS LNAV); for precision approaches 600-2 (ILS or PAR). Airports within this geographical area that require alternate minimums other than standard or alternate minimums with restrictions are listed below. NA - means alternate minimums are not authorized due to unmonitored facility or absence of weather reporting service. Civil pilots see FAR 91. IFR Alternate Airport Minimums: Ceiling and Visibility Minimums not applicable to USA/USN/USAF. Pilots must review the IFR Alternate Airport Minimums Notes for alternate airfield suitability.

NAME	ALTERNATE MINIMUMS

ALBANY, OR

ALBANY MUNI ..... **VOR/DME or GPS-A**
NA except for operators with approved weather reporting service.

ARLINGTON, WA

ARLINGTON MUNI ..... **NDB or GPS Rwy 34**
Category D, 800-2½.
NA when Paine Field control tower closed.

ASTORIA, OR

ASTORIA RGNL ..... **RNAV (GPS) Rwy 26[12]**
VOR Rwy 8[3]
[1]NA when local weather not available.
[2]Categories A, B, 900-2; Category C, 900-2¾; Category D, 900-3.
[3]Category C, 800-2¼; Category D, 900-3.

AURORA, OR

AURORA STATE ..... **LOC Rwy 17[1]**
RNAV (GPS) Rwy 17[23]
RNAV (GPS) Rwy 35[2]
[1]Category D, 800-2¼.
[2]NA when local weather not available.
[3]Categories A, B, 900-2; Category C, 900-2½; Category D, 900-2¾.

BAKER, MT

BAKER MUNI ..... **NDB Rwy 13[1]**
NDB Rwy 31[2]
[1]Categories A,B, 1100-2; Categories C,D, 1100-3.
[2]Categories A,B, 1000-2; Category C, 1000-2¾; Category D, 1000-3.

BAKER CITY, OR

BAKER CITY MUNI ..... **RNAV (GPS) Rwy 13[12]**
VOR-A[13]
VOR/DME Rwy 13[24]
[1]NA when local weather not available.
[2]Category D, 900-2¾.
[3]Categories A,B, 1900-2; Categories C,D, 1900-3.
[4]NA when control zone not in effect.

NAME	ALTERNATE MINIMUMS

BELLINGHAM, WA

BELLINGHAM INTL ..... **ILS or LOC Rwy 16**
RNAV (GPS) Rwy 16
NA when local weather not available.

BIG PINEY, WY

MILEY MEMORIAL FIELD ..... **VOR Rwy 31**
Category D, 800-2¼.

BILLINGS, MT

BILLINGS LOGAN INTL ..... **NDB Rwy 10L[1]**
RNAV (GPS) Rwy 10L[2]
RNAV (GPS) Rwy 28R[3]
[1]Category D, 800-2¼.
[2]Categories A,B,C,D, 800-2¼.
[3]Categories A,B, 900-2; Categories C,D, 900-3.

BOISE, ID

BOISE AIR TERMINAL(GOWEN FIELD) ..... **LOC BC Rwy 28L**
RNAV (GPS) Y Rwy 10R
RNAV (GPS) Y Rwy 28L
VOR/DME or TACAN Rwy 10L
VOR/DME or TACAN Rwy 28L
Category E, 1000-3.

BOZEMAN, MT

GALLATIN FIELD ..... **RNAV (GPS)-A[1]**
VOR Rwy 12[2]
[1]Categories A, B, 1900-2; Categories C, D, 1900-3.
[2]Categories A, B, 900-2; Category C, 900-2¾; Category D, 900-3.

BREMERTON, WA

BREMERTON NATIONAL .. **RNAV (GPS) Rwy 1**
RNAV (GPS) Rwy 19[1]
NA when local weather not available.
[1]Categories A,B, 1200-2; Categories C,D, 1200-3.

29 JUL 2010 to 26 AUG 2010

ARLINGTON, WA

ARLINGTON MUNI

TAKE-OFF MINIMUMS: **Rwy 11,** 600-2 or std. with a min. climb of 350' per NM to 700. **Rwy 34,** 500-2 or std. with a min. climb of 260' per NM to 700.

DEPARTURE PROCEDURE: **Rwy 11,** turn right. **Rwy 16**, climb direct to WATON LOM. **Rwys 29,34**, turn left. **All aircraft** climb direct to WATON LOM. Aircraft departing WATON LOM on bearings 150° CW 200° and bearings 260° CW 340° from WATON LOM continue climb on course. Aircraft departing WATON LOM on bearings 340° CW 150° from WATON LOM climb in holding pattern (S, left turns, 339° inbound) to 4500 then continue climb on course. Aircraft departing WATON LOM on bearings 200° CW 260° from WATON LOM climb in holding pattern (S, left turns, 339° inbound) to 1500 then continue climb on course.

ASTORIA, OR

ASTORIA RGNL

TAKE-OFF MINIMUMS: **Rwy 8**, 800-3 or std. with a min. climb of 320' per NM to 900. **Rwy 13**, 700-2 or std. with a min. climb of 350' per NM to 800.

DEPARTURE PROCEDURE: **Rwys 8,31,** turn left. **Rwy 13**, climb runway heading to 800 then climbing right turn. **Rwy 26**, turn right. Aircraft departing northwestbound climb via AST R-290 on course. **All other aircraft** climb to 1500 or above via AST R-290 then left turn to AST VOR/DME and continue climbing on course.

AUBURN, WA

AUBURN MUNI

DEPARTURE PROCEDURE: Use AUBURN DEPARTURE.

AURORA, OR

AURORA STATE

DEPARTURE PROCEDURE: **Rwy 17**, turn right, thence... **Rwy 35**, turn left, thence... ...Aircraft proceeding via V23 climb on course; All others climb in UBG VOR/DME holding pattern (hold south, left turn, 003° inbound) to cross UBG VOR/DME at or above MEA/MCA for direction of flight.

NOTE: **Rwy 17,** multiple trees 31' from departure end of runway, 273' right of centerline, up to 90' AGL/270' MSL. Multiple trees beginning 979' from departure end of runway, 247' right of centerline up to 113' AGL/316' MSL. Road 254' from departure end of runway, 350' left of centerline, 16' AGL/209' MSL. **Rwy 35,** multiple trees and road beginning 31' from departure end of runway, 163' left of centerline, up to 138' AGL/329' MSL. Multiple trees beginning 973' from departure end of runway, 281' right of centerline, up to 58' AGL/253' MSL.

BAKER, MT

BAKER MUNI

NOTE: **Rwy 13,** 51' derrick 2200' from departure end of runway on centerline. 100' trees south of airport, near runway, various locations. **Rwy 31,** 146' antenna on tower 4000' from departure end of runway, 1800' left of centerline. 114' rod on OL antenna 3800' from departure end of runway on centerline.

BAKER CITY, OR

BAKER CITY MUNI

TAKE-OFF MINIMUMS: **Rwy 8**, 900-2 or std. with a min. climb of 315' per NM to 6000, (788' per min. at 150K, 1050' per min. at 200K, 1313' per min. at 250K). **Rwy 13**, 1400-2 or std. with a min. climb of 310' per NM to 6000 (775' per min. at 150K, 1033' per min. at 200K, 1292' per min. at 250K). **Rwy 17**, NA. **Rwy 31**, 1300-2 or std. with a min. climb of 240' per NM to 6000 (600' per min. at 150K, 800' per min. at 200K, 1000' per min. at 250K). **Rwy 35**, CAT C,D 1000-2; or std. with a min. climb of 240' per NM to 6000 (600' per min. at 150K, 800' per min. at 200K, 1000' per min. at 250K).

DEPARTURE PROCEDURE: **Rwys 8,13**, turn left. **Rwys 26,31,35,** turn right. **All aircraft** climb direct BKE VOR/DME. Continue climb in BKE holding pattern (SE, right turns, 298° inbound) to cross BKE VOR/DME at or above MCA or MEA for route of flight.

BELLINGHAM, WA

BELLINGHAM INTL

DEPARTURE PROCEDURE: **Rwy 16,** climb heading 160° to 600, then climbing right turn direct HUH VORTAC. Do not exceed 210 KIAS until established northbound. **Rwy 34,** climb heading 340° to 600, then climbing left turn to intercept HUH R-145 to HUH VORTAC, continue climb in holding pattern (northwest, right turn, 149° inbound) to MEA as appropriate for direction of flight.

NOTE: **Rwy 16,** lighted windsock 9' from departure end of runway, 259' right of centerline, 16' AGL/181' MSL. Multiple trees beginning 747' from departure end of runway, 405' right of centerline, up to 68' AGL/213' MSL. Multiple trees beginning 1128' from departure end of runway, 57' left of centerline, up to 104' AGL/249' MSL. **Rwy 34,** lighted windsock 93' from departure end of runway, 516' right of centerline, 27' AGL/169' MSL. multiple trees beginning 1372' from departure end of runway, 619' right of centerline, up to 134' AGL/246' MSL.

BEND, OR

BEND MUNI (BDN)

AMDT 4 09183 (FAA)

DEPARTURE PROCEDURE: Use BEND DEPARTURE.

BIG PINEY, WY

MILEY MEMORIAL FIELD

TAKE-OFF MINIMUMS: **Rwys 8,26,** NA.

DEPARTURE PROCEDURE: **Rwy 13,** climb to 8400 via BPI R-124. **Rwy 31,** climb to 10800 via BPI R-320 thence all aircraft climb on course.

AURORA, OREGON

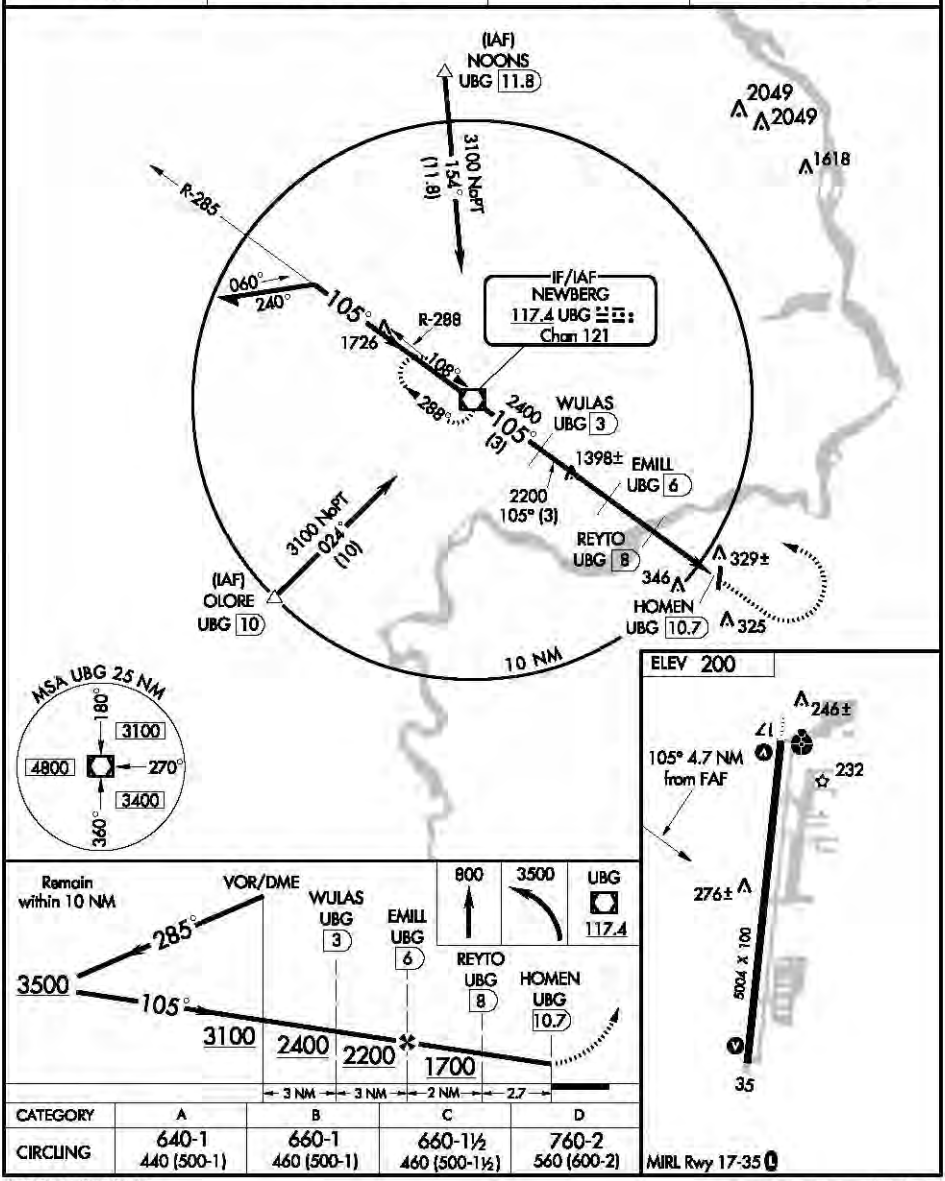
AL-5722 (FAA)

VOR/DME-A
AURORA STATE (UAO)

VOR/DME UBG	APP CRS	Rwy Idg	N/A
117.4	105°	TDZE	N/A
Chan 121		Apt Elev	200

MISSED APPROACH: Climb to 800 then climbing left turn to 3500 direct UBG VOR/DME and hold.

ASOS	PORTLAND APP CON	CLNC DEL	UNICOM
118.525	126.0 284.6	119.95	122.7 (CTAF)



CATEGORY	A	B	C	D
CIRCLING	640-1 440 (500-1)	660-1 460 (500-1)	660-1½ 460 (500-1½)	760-2 560 (600-2)

NW-1, 29 JUL 2010 to 26 AUG 2010
NW-1, 29 JUL 2010 to 26 AUG 2010

AURORA, OREGON

AL-5722 (FAA)

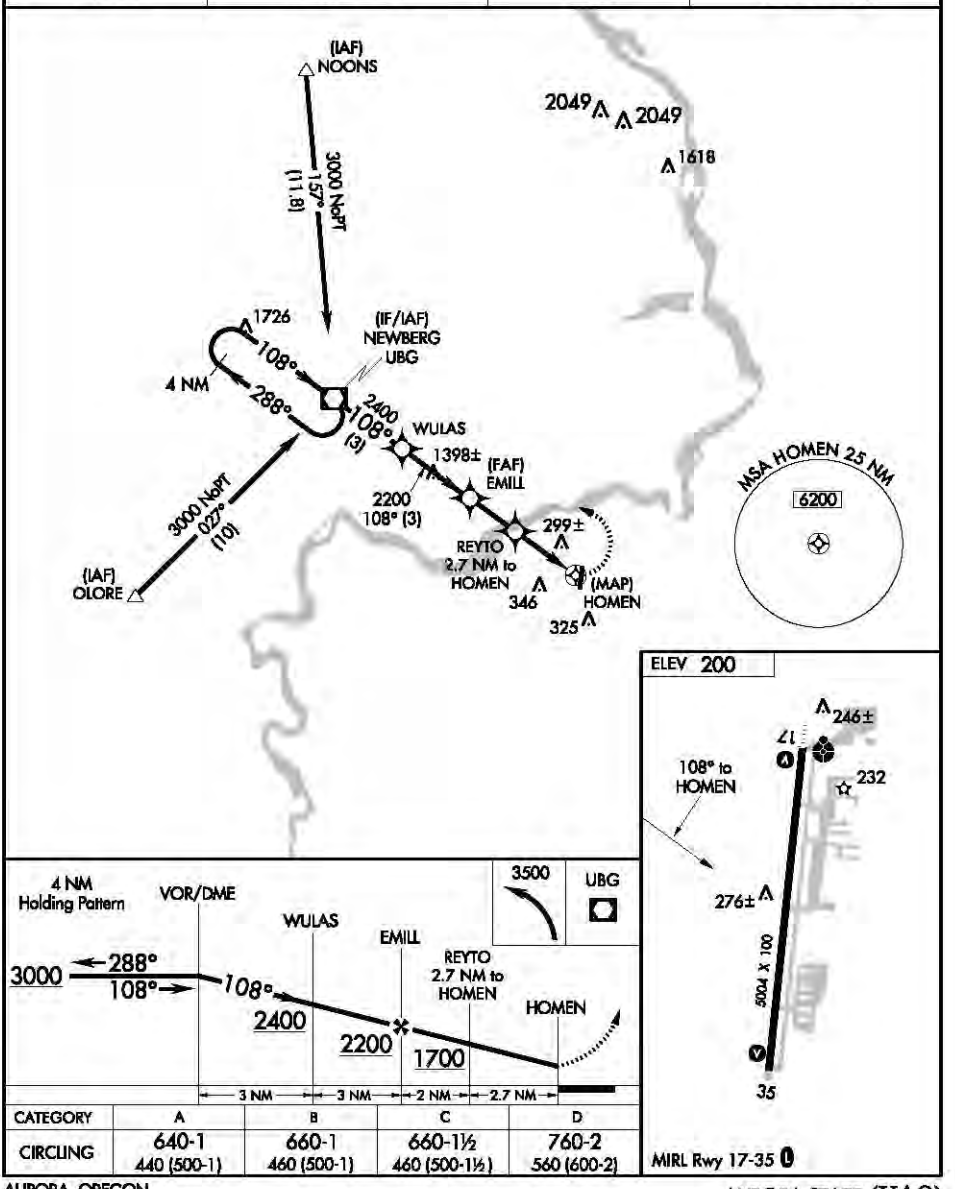
RNAV (GPS)-B
AURORA STATE (UAO)

APP CRS	Rwy ldg	N/A
108°	TDZE	N/A
	Apt Elev	200

DME/DME RNP- 0.3 NA.

MISSED APPROACH: Climbing left turn to 3500 direct UBG VOR/DME and hold.

ASOS	PORTLAND APP CON	CLNC DEL	UNICOM
118.525	126.0 284.6	119.95	122.7 (CTAF)



CATEGORY	A	B	C	D
CIRCLING	640-1 440 (500-1)	660-1 460 (500-1)	660-1½ 460 (500-1½)	760-2 560 (600-2)

AURORA, OREGON
Orig 09211

45°15'N-122°46'W

AURORA STATE (UAO)
RNAV (GPS)-B

NW-1, 29 JUL 2010 to 26 AUG 2010

NW-1, 29 JUL 2010 to 26 AUG 2010

AURORA, OREGON

AL-5722 (FAA)

RNAV (GPS) RWY 35

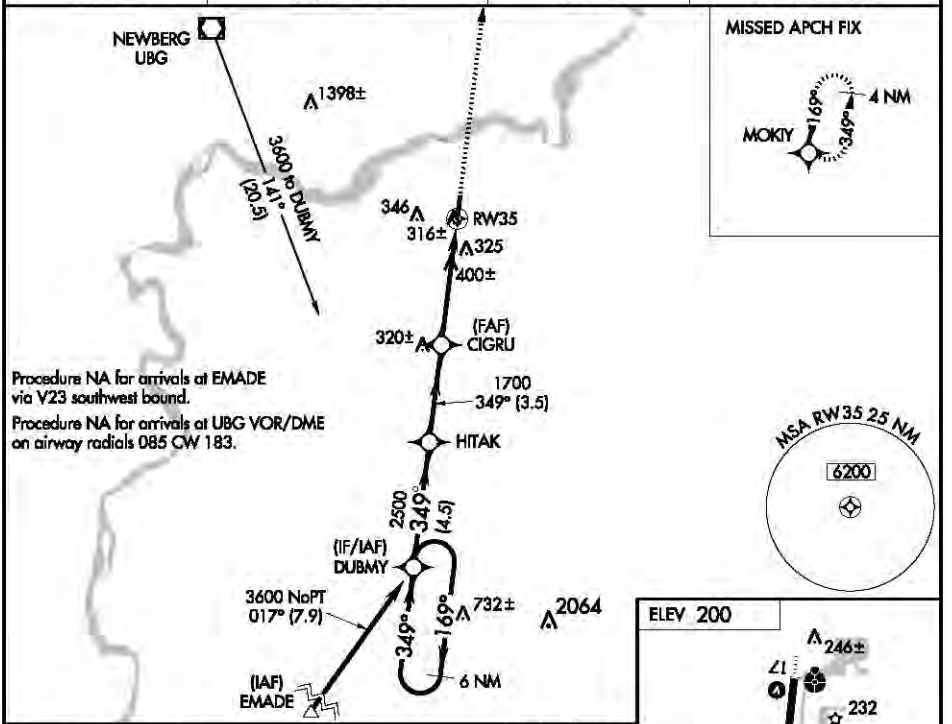
AURORA STATE (UAO)

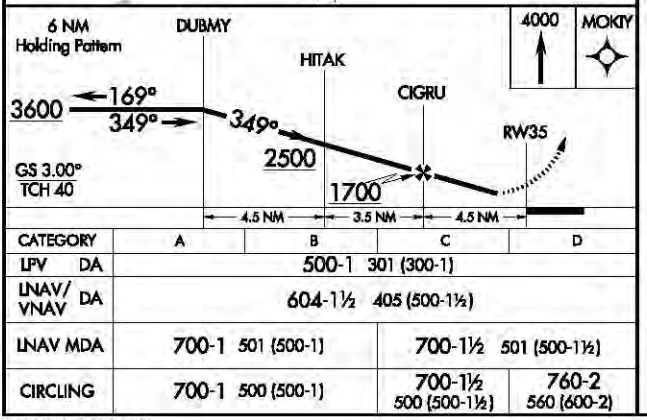
WAAS CH 77508 W35A	APP CRS 349°	Rwy Idg 5004 TDZE 199 Apt Elev 200

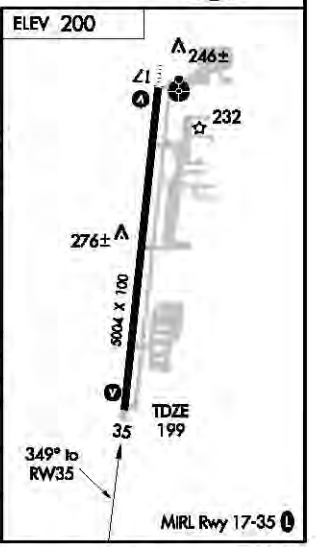
DME/DME RNP-0.3 NA. For uncompensated Baro-VNAV systems, LNAV/VNAV NA below -15°C (5°F) or above 48°C (118°F). When local altimeter setting not received, use Mc Minnville Muni altimeter setting and increase all DA 42 feet and MDA 60 feet; increase LPV, LNAV/VNAV visibilities ¼ mile all Cats, increase LNAV Cat D visibility to 1½. Visibility reduction by helicopters NA. Baro-VNAV NA when using Mc Minnville Muni altimeter setting.

MISSED APPROACH: Climb to 4000 direct MOKIY and hold, continue climb-in-hold to 4000.

ASOS 118.525	PORTLAND APP CON 126.0 284.6	CLNC DEL 119.95	UNICOM 122.7 (CTAF)







CATEGORY	A	B	C	D
LPV DA	500-1 301 (300-1)			
LNAV/VNAV DA	604-1½ 405 (500-1½)			
LNAV MDA	700-1 501 (500-1)		700-1½ 501 (500-1½)	
CIRCLING	700-1 500 (500-1)		700-1½ 500 (500-1½)	760-2 560 (600-2)

AURORA, OREGON
Orig-C 09239

45°15'N-122°46'W

AURORA STATE (UAO)

RNAV (GPS) RWY 35

NW-1, 29 JUL 2010 to 26 AUG 2010

NW-1, 29 JUL 2010 to 26 AUG 2010

AURORA, OREGON

AL-5722 (FAA)

RNAV (GPS) RWY 17

AURORA STATE (UAO)

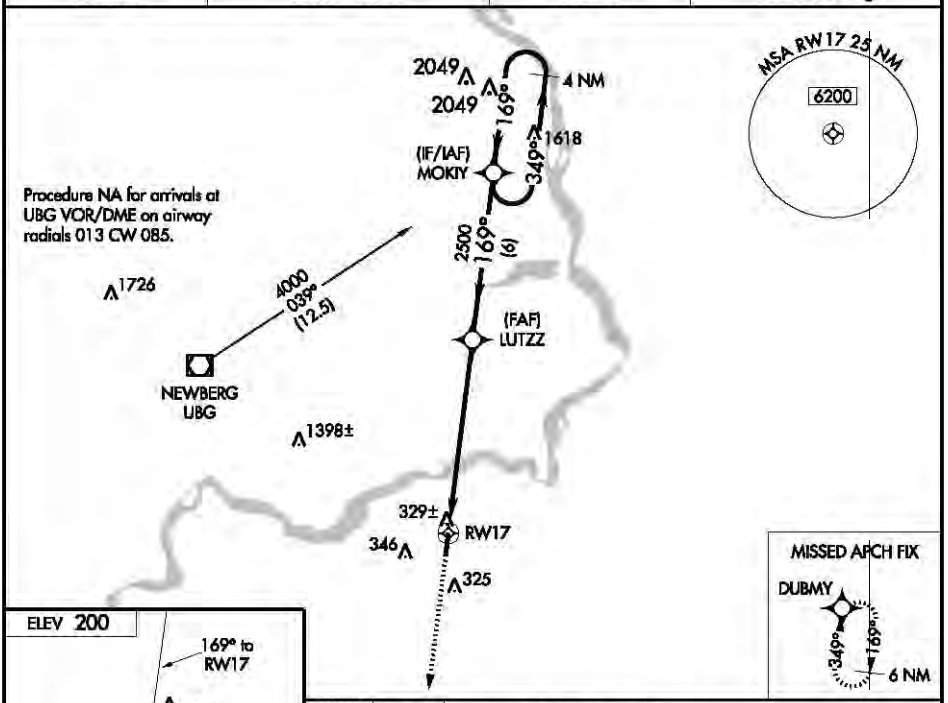
WAAS CH 70308 W17A	APP CRS 169°	Rwy Idg 5004 TDZE 200 Apt Elev 200

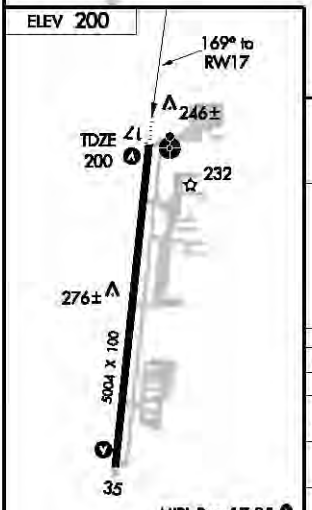
DME/DME RNP-0.3 NA. When local altimeter setting not received, use Mc Minnville Muni altimeter setting and increase all DA 42 feet and all MDA 60 feet; increase LPV, LNAV/VNAV visibilities all Cats. ¼ mile, increase LNAV visibility Cats. A/C/D ¼ mile, increase Circling visibilities Cats. A/C/D ¼ mile. For uncompensated Baro-VNAV systems, LNAV/VNAV NA below -15°C (5°F) or above 49°C (120°F). Inoperative table does not apply. Visibility reduction by helicopters NA.

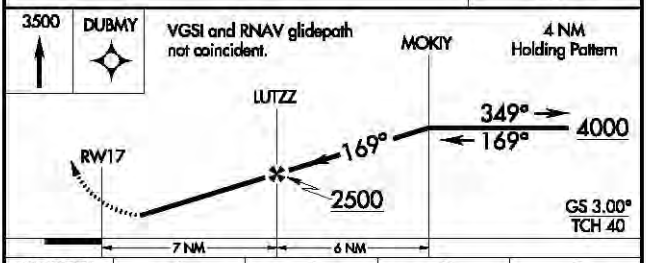
ODALS

MISSED APPROACH: Climb to 3500 direct DUBMY and hold, continue climb-in-hold to 3500.

ASOS	PORTLAND APP CON	CLNC DEL	UNICOM
118.525	126.0 284.6	119.95	122.7 (CTAF)







CATEGORY	A	B	C	D
LPV DA	550-1¼ 350 (400-1¼)			
LNAV/VNAV DA	580-1¼ 380 (400-1¼)			
LNAV MDA	1060-1 860 (900-1)	1060-1¼ 860 (900-1¼)	1060-2½ 860 (900-2½)	1060-2¾ 860 (900-2¾)
CIRCLING	1060-1 860 (900-1)	1060-1¼ 860 (900-1¼)	1060-2½ 860 (900-2½)	1060-2¾ 860 (900-2¾)

NW-1, 29 JUL 2010 to 26 AUG 2010

NW-1, 29 JUL 2010 to 26 AUG 2010

AURORA, OREGON

AL-5722 (FAA)

LOC RWY 17
AURORA STATE (UAO)

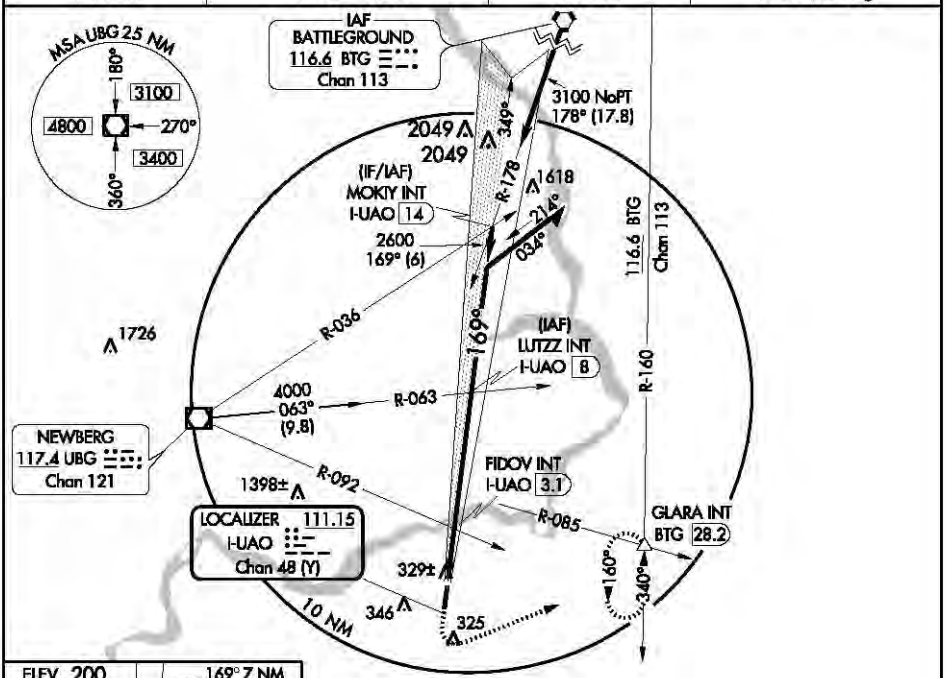
LOC/DME I-UAO	APP CRS	Rwy Idg	5004
111.15	169°	TDZE	200
Chan 48 (Y)		Apt Elev	200

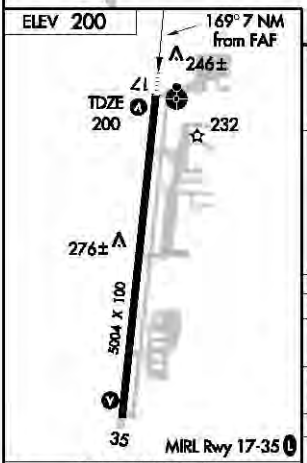
Inoperative table does not apply.

ODALS

MISSED APPROACH: Climb to 900 then climbing left turn to 4000 via heading 050° and BTG R-160 to GLARA Int/ BTG 28.2 DME and hold. Continue climb-in-hold to 4000.

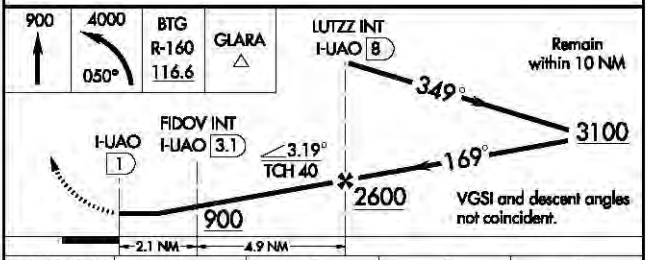
ASOS	PORTLAND APP CON	CLNC DEL	UNICOM
118.525	126.0 284.6	119.95	122.7 (CTAF)





FAF to MAP 7 NM

Knots	60	90	120	150	180
Min:Sec	6:59	4:40	3:29	2:47	2:19



CATEGORY	A	B	C	D
S-17	900-1 700 (700-1)		900-2 700 (700-2)	900-2¼ 700 (700-2¼)
CIRCLING	900-1 700 (700-1)		900-2 700 (700-2)	900-2¼ 700 (700-2¼)
FIDOV FIX MINIMUMS				
S-17	580-1 380 (400-1)			580-1¼ 380 (400-1¼)
CIRCLING	640-1 440 (500-1)	660-1 460 (500-1)	660-1½ 460 (500-1½)	760-2 560 (600-2)

AURORA, OREGON
Amdt 1 09183

45°15'N-122°46'W

AURORA STATE (UAO)
LOC RWY 17

NW-1, 29 JUL 2010 to 26 AUG 2010
NW-1, 29 JUL 2010 to 26 AUG 2010

Appendix E:
PAC MEETING SUMMARIES

Airport Master Plan Update

Aurora State Airport

Aurora State Airport Master Plan & Airport Layout Plan Update

Kick-Off Meeting Summary

November 3, 2009
Maplewood Grange Hall
6:00 – 7:30 p.m.

Attendees:

Oregon Department of Aviation: Gregg Dal Ponte, Interim Director; Mark Gardiner, State Aviation Board Chair; Christopher Cummings, Planning & Projects Manager; Mitch Swecker, State Airports Manager; and John Wilson, Airport Operations Specialist

WHPacific, Inc: Rainse Anderson, Project Manager; Sara Funk, Senior Aviation Planner; and Sarah Lucas, Aviation Planner

Members of the Public: 65 people signed in. Refer to attached sign-in sheets

Welcome and Introductions	Gregg Dal Ponte opened the meeting at 6:10 pm by welcoming everyone and thanking them for their attendance. Mr. Dal Ponte then introduced the ODA staff attending the meeting, prior to introducing the consultant team's Project Manager, Rainse Anderson. Mr. Anderson introduced his project team: Sara Funk and Sarah Lucas. Personally, Mr. Anderson has completed numerous planning, environmental and engineering projects at the Aurora State Airport for the past 32 years. Ms. Funk and Ms. Lucas have completed numerous airport master plans and other planning studies. The following information was presented in a PowerPoint format, which has been placed on the project website.
Purpose of the Master Plan Update	Mr. Anderson reviewed the purpose of updating the master plan, which is a document that guides the development of the Airport over a 20-year planning period. The last master plan was completed in 2000. Typically, general aviation airports, like Aurora State, have the master plan updated every seven to ten years. The focus of the Master Plan is to update the inventory, demand forecasts, Airport Layout Plan (ALP) and capital improvement plan (CIP). Additionally, to be eligible for federal or state funding, a project must be shown on the approved ALP.
Project Components	Ms. Funk and Ms. Lucas reviewed the individual components of a master plan, which are:

- *Chapter 1 – Airport Issues and Goals*
- *Chapter 2 – Airport Inventory*
- *Chapter 3 – Aeronautical Activity Forecast*
- *Chapter 4 – Facility Requirements*
- *Chapter 5 – Airport Alternatives*
- *Chapter 6 – Airport Layout Plan and Associated Drawings*
- *Chapter 7 – Capital Improvement Plan*

Federal Aviation Administration (FAA) Advisory Circular (AC) 150/5070-6B, *Airport Master Plans*, and other relevant ACs, Federal Orders and Aviation Regulations will be used for project guidance.

Details of each chapter are:

- Chapter 1 – Airport Issues and Goals
  - Dissemination of surveys to better understand Airport use:
    - User Survey (available at tonight's meeting, FBOs and project website: www.aurorastateairport.org)
    - Runway Usage Survey (to be mailed to businesses, responses will be reported in chapter)
  - Interview FBOs at nearby airports
  - Strategic Role
- Chapter 2 – Airport Inventory
  - On-site inspection of airport facilities (Airfield, Landside and Airport Support Facilities)
  - Airspace
  - Land Use Planning and Zoning
  - Environmental Inventory
  - Aviation Activity Data
  - Airport Financial Data
- Chapter 3 – Aeronautical Activity Forecast
  - Critical Aircraft
  - Based Aircraft
  - Operations Forecast
  - *To be approved by the FAA*
- Chapter 4 – Facility Requirements
  - Identify the ability of the airport facilities to meet forecasted demand and other needs
- Chapter 5 – Airport Alternatives
  - Three build alternatives, in addition to the no build alternative, will be

developed to address the needs identified in Chapter 4.

- Chapter 6 – Airport Layout Plan and Associated Drawings
  - Airport Layout Plan (ALP)
  - Airport Airspace Drawing
  - Inner Portion of the Approach Surface Drawing
  - Terminal Area Drawing
  - Land Use and Noise Contour Drawing
  - Runway Departure Surfaces Drawing
  - Airport Property Map (Exhibit A)
  - *To be approved by the FAA*
- Chapter 7 – Capital Improvement Plan
  - Will identify the cost associated with the ALP improvements and potential funding sources for the projects.

Project Schedule

Mr. Anderson relayed the project is on an 18-month schedule, which allocates review period for ODA, FAA and PAC prior to each public meeting. There will be a total of seven meetings that include a public kick-off meeting, six PAC work sessions and five open houses.

The meeting schedule is subject to change; however, tentative dates for upcoming meetings are:

- Public Kick-Off Meeting – November 3, 2009
- PAC Meeting #1 – January 2010
- PAC Meeting #2 * – April 2010
- PAC Meeting #3 * –June 2010
- PAC Meeting #4 * – September 2010
- PAC Meeting #5 * – December 2010
- PAC Meeting #6 * – January 2011

** Immediately following these PAC meetings, there will be public open houses to cover the same topics of the PAC meeting (the first open house will cover the topics of both meeting #2 and meeting #1).*

The project website www.aurorastateairport.org will have specific dates posted, as soon as they are determined.

Planning Advisory Committee (PAC) Formation; Roles and Responsibilities

Mitch Swecker discussed the Planning Advisory Committee (PAC), which is still being developed. The PAC will represent members who have varying interests in the Airport. Current members of the PAC represent Marion County, Clackamas County, City of Aurora, City of Wilsonville, Aurora Fire District, Airport Fixed Base Operators (3), Oregon Department of Aviation, Charbonneau, and Deer Creek. Four at-large representatives will be selected for the following groups: Community Representative, Airport Business, On-

Airport Tenant, and Off-Airport Tenant.

A review panel, consisting of four ODA employees, will conduct a blind review to select the at-large PAC representatives based on application responses. If interested in serving as an at-large representative, please complete the application posted at www.aurorastateairport.org. Applications for the at-large positions are due by November 17, 2009.

Mr. Anderson reminded attendees the PAC is an advisory committee to ODA and ODA has final authority over the Master Plan. If serving on the PAC, members are asked to provide input to help produce a plan that balances a wide range of airport stakeholder needs and concerns; bring forward comments and concerns of those they represent; and help disseminate accurate information about the plan.

Discussion of Goals and Issues for Plan

Once the presentation was completed, attendees were able to comment and ask ODA and WHPacific specific questions about the master plan update. Below is a summary of the questions/comments and responses (*in italics*).

- There is a survey of airport users – what consideration will there be for non-airport users? *The PAC meetings and public open houses provide representation for airport neighbors.*
- Please elaborate the four at-large PAC positions. *The at-large PAC positions will be for people representing one of the following: community resident, airport business, on-airport tenant, and off-airport tenant.*
- Is there a formal tie between the Plan and agencies? *Yes, the Plan, once approved by ODA, FAA, and the State Aviation Board, will be taken to Marion County for formal adoption into the County's Comprehensive Plan.*
- The website should have a place for comments. *Yes, the website has a comment form.*
- The alternatives will have varying impacts on the surrounding community. What analysis will be done to address this? *Each alternative will have noise contours drawn, as well as an environmental review that includes factors such as social impacts, socioeconomic impacts, etc.*
- Are there records of airport operations for the last ten years? *Operations data for airports without air traffic control towers is difficult to acquire and we rely on any historical data that is available, which includes the ODA RENS acoustical counter information. The last count was completed in the 2002-2003 cycle, which reported 62,926 operations. The RENS program is no longer operational.*
- If it takes 18 months to do a count and the project timeline is 18 months, why not do a count now to ensure an accurate baseline? *Even if the RENS program were operational, the forecasts are done during the beginning stages of a master plan update so it would*

actually add 12-18 months to the project schedule.

- Isn't federal funding and prioritization based on aircraft operations? *No, federal funding is not contingent upon aircraft operations. Instead, funding for a general aviation airport like Aurora State is based on the airport's need and the demand for the project. Having a project on an approved ALP (making it eligible for federal funding) does not necessarily justify the funding. Additional justification may be required, depending on the project.*
- What was the impetus for updating the 2000 Master Plan? *To reflect current conditions and changes at an airport, most general aviation airports will have the master plan updated every seven to ten years.*
- How does the air traffic control tower fit into the plan? *The FAA will be completing an independent tower survey in March 2010. A benefit cost analysis was completed and showed a tower is justified at Aurora State. Funding for the project has not been secured at this time.*
- The last master plan did not discuss an air traffic control tower, but it was shown in the ALP. How can that happen? *Showing a project on the ALP does not justify funding, so it is possible one was shown without much discussion within the master plan. The 1976 Master Plan did show a tower.*
- Having an air traffic control tower means more large aircraft operating at the Airport. *Having an air traffic control tower at the Airport does not necessarily mean increased traffic, louder traffic, or larger aircraft. Traffic may actually lessen because smaller aircraft may displace to un-controlled airports. Additionally, new technology has created many jet engines that are quieter than propeller driven aircraft. The air traffic control tower is for safety.*
- What type of fire protection does the Airport have? *The Aurora Fire District protects the Airport. The District has a crash truck that will be used at the Airport and they are currently training volunteers (fire trucks are only required at commercial service airports). Through funding from private business partnership, a fire suppression system was recently installed at the Airport, with a mainline and fire hydrants running the full length of the Airport. The City of Aurora doesn't even have a fire suppression system.*
- The Airport does not have a vision statement. Will one be included in the Plan? *The strategic analysis and review of issues/goals will create an opportunity to develop the Airport's vision.*
- Will there be a study on adjacent property evaluation? *No, a property valuation will not be completed.*
- Is sewer and water an issue at the Airport? *Yes, currently all septic needs are met with individual septic systems and drain fields. The land could be better utilized if not needed for the drain fields. Water is currently supplied by individual well.*

- The Airport has many benefits such as emergency and disaster relief, tax income, job creation and tourism. Is this addressed in the Plan? *Yes, the strategic role analysis will identify these advantages. Additionally, Aurora State is outside of the 100-year floodplain unlike other I-5 airports (i.e., Chehalis).*
- Are Marion and Clackamas County represented on the PAC? *Yes.*
- The 2000 Master Plan is straightforward and doesn't incorporate some of the considerations other modes of transportation include. Will the goals of SB 680 be included? *The FAA provides guidance for an airport master plan and this master plan is primarily funded by the FAA. The airport master plan scope was developed to fit the FAA's criteria, while also tailoring the project to Aurora State Airport.*
- What agency or external involvement will there be during the planning process? *Many local and state agencies will be notified about upcoming public meetings, some of which are on the PAC, and the final Plan will be taken to Marion County for adoption within the Comprehensive Plan.*

Future Meeting Dates and Times

The next meeting will be a PAC meeting open to the public to discuss draft Chapters 1 and 2 (issues/goals and inventory) and it is tentatively scheduled for January 2010. Location is yet to be determined.

The meeting adjourned at 7:30 pm.

Aurora State Airport Master Plan & Airport Layout Plan Update – Kick-Off Meeting

November 3, 2009
Maplewood Grange Hall
6:00 – 7:30 p.m.

SIGN IN SHEET

NAME	REPRESENTING	MAILING ADDRESS	PHONE#	E-MAIL
LARRY AGNEW - DEER CREEK		21995 LAUREL AVENUE, AURORA	503-678-2937	DEERFLIES@GMAIL.COM
Ginny Agnew -	" "	"	"	
DAN RICHES – COLUMBIA HELICOPTERS		14452 ARNDT RD NE AURORA	503-678-1222	danrich@colheli.com
Richard F. Jenks (Self)	Prop. Owner	PO Box 67 Aurora OR 97002	503-678-1843	NA
DAVE VOLZ	Aviation Engineering Mgr.	22930 SW ERIC Place	503 682 0512	
Steve Nash		21811 Beans Ferry Rd NE Aurora	503 678-3331	
Steve Hurst / Wilsonville		8585 SW Cascade Loop	503-869-5896	hurstclan@verizon.net
Jim McIrow	City of Aurora	P.O. Box 352 Aurora OR	503-969-8179	Jimmcirow@yahoo.com
Patti Milne	Marion County BOC	POBox 14500 Salem OR 97309	503 589 3268	pmilne@co.marion.or.us
Emily Hepper	Clackamas Co	2051 Kaen Rd OC 97045	971 742 5933	EmilyHe@co.clackamas.or.us
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Aurora State Airport Master Plan & Airport Layout Plan Update – Kick-Off Meeting

November 3, 2009
Maplewood Grange Hall
6:00 – 7:30 p.m.

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Aurora State Airport Master Plan & Airport Layout Plan Update – Kick-Off Meeting

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Aurora State Airport Master Plan

Planning Advisory Committee (PAC) Meeting #1

July 22, 2010
Charbonneau Country Club

MEETING SUMMARY

Welcome and Introductions

At 6:10 the meeting commenced. Chris Cummings, Oregon Department of Aviation (ODA) Planning and Projects Manager, welcomed everyone and thanked them for attending. Mr. Cummings gave an overview of what ODA does as an agency, which includes owning and managing 28 airports in Oregon. The Aurora State Airport (Airport) is the largest and busiest Airport that ODA owns. Other ODA employees attending the meeting were introduced: Doug Hedlund, Interim Director; John Wilson, Airport Operations Specialist; Mitch Swecker, State Airports Manager; and Sandi Larsen, Planning Analyst. The Consultant, WHPacific, who is preparing the Master Plan (Plan) was then introduced. WHPacific team members were Rainse Anderson, Project Manager; Sara Funk, Senior Aviation Planner; and Sarah Lucas, Aviation Planner. Other sub-consultants on the project are (not in attendance): Bergman Photographic Services, aerial photography; Corvid Consulting, environmental services; and Jeanne Lawson and Associates, public outreach.

The Planning Advisory Committee (PAC) then introduced themselves. Below is a list of the PAC members (all were present at the meeting), along with their affiliations.

- Bruce Bennett – Aurora Aviation
- Jim Bernard – Clackamas County Board of Commissioners
- Jim Hansen – On-Airport / Tenant
- Tony Helbling – Off-Airport / Tenant & Business (Wilson Construction Co)
- John Henri – City of Canby
- Tony Holt – Charbonneau Country Club
- Steve Hurst – City of Wilsonville
- Nick Kaiser – Community
- Roger Kaye – Friends of Marion County
- Rick Kosta – Deer Creek Estates
- James Meirow – City of Aurora
- Ted Millar – Aurora State Airport Business – Southend Airpark
- Patty Milne – Marion County Board of Commissioners
- Fred Netter – Aurora Fire District

- Dan Riches – Columbia Helicopters
- Scott Starr – Wilsonville Chamber of Commerce
- Mitch Swecker – Oregon Department of Aviation
- David Waggoner – Willamette Aviation
- Craig Wilmes – Aurora Jet Center

The PAC was formed by ODA to represent varying interests at the Airport that includes on and off-airport businesses, local government agencies, surrounding communities and four at-large positions. The at-large positions were announced as available at the November 2009 kick-off meeting and applications were submitted to ODA. ODA performed a double-blind review of the applications to select the at-large representatives.

Review of Process and Revised Schedule

The WHPacific Consulting Team then described the Master Plan's purpose, process, the PAC's involvement and the project schedule. Below is an overview of the information discussed.

Purpose of the Master Plan – A Master Plan is a document that guides the development of the Airport over a 20-year planning period. The focus of the Master Plan is to update the inventory, demand forecasts, Airport Layout Plan (ALP) and capital improvement plan (CIP). To be eligible for federal or some state funding, a project must be shown on the approved ALP.

The Master Plan Process – The Master Plan will consist of seven chapters: 1) Airport Issues and Goals, 2) Airport Inventory, 3) Aeronautical Activity Forecast, 4) Facility Requirements, 5) Airport Alternatives, 6) Airport Layout Plan and Associated Drawings, and 7) Capital Improvement Plan. The Forecast and Airport Layout Plan will require Federal Aviation Administration (FAA) approval. Once a final draft is complete, ODA will present the Plan to the State Aviation Board for approval and submittal to the FAA. ODA will request the Plan be adopted into the Marion County Comprehensive Plan.

Parameters of the Plan – An overview of what the Plan will not do was then given. The Plan will not:

- Analyze the Airport's economic impact; this information is included in the 2007 Oregon Aviation Plan
- Prepare a surface transportation plan for off-airport area; the Plan will consider local transportation system plans.
- Change land use designations; existing land use designations for the Airport and surrounding area will be identified and any deficiencies will be noted
- Develop a vision statement for the Airport; rather, it will focus on the Airport's strategic role and issues/goals.
- Commit FAA or ODA to fund improvements in the Plan; development will only be funded if justified

Several PAC members had questions about the Plan's parameters. These questions and answers were:

Q – Why will there not be a vision statement for the Airport in the Plan? How can you develop a plan without a vision?
A – We are gathering the goals and issues from all parties now, without them you can't develop a vision. As the Plan progresses, a vision of the airport may develop, but it won't be in the form of a one sentence vision statement.

Q – Who signed off on no impact to Clackamas County?
A – No one signed off on anything to that effect. The Plan will consider Clackamas County, as well as all surrounding areas. However, the Airport is located in Marion County and they will be the ones adopting the Plan into the Comprehensive Plan. The Intergovernmental Agreement (IGA) that shows an impact area is completely separate from the Plan and is not considered.

Q – Is ODA coming to the table with an agenda?
A – No. Financial self-sufficiency, however, is desired for all state-owned airports.

Q – Can a plan be set firm without surface transportation planning?
A – The plan will consider local surface transportation planning, but it is not a surface transportation plan.

Q – Is the IGA tied to the air traffic control tower?
A – No, the IGA is not tied to the tower except that Marion County will be the county that approves permit applications for construction.

At this point, WHPacific clarified the Airport's "fence." There is a difference between the state's property and the fence around the Airport environs. Accessing the Airport from private property to the state's airport property is called going "through-the-fence." The perimeter fence, which includes state and private property, is for safety and security purposes.

PAC Roles and Responsibilities – The PAC is an advisory committee to ODA; ODA has final authority over the Master Plan. Members are asked to provide input to help produce a plan that balances a wide range of airport stakeholder needs and concerns; bring forward comments and concerns of those they represent; and help disseminate accurate information about the plan.

Project Schedule – There are approximately 12 months remaining in the project. The schedule allocates review periods of all documents prior to each PAC meeting for ODA, FAA and PAC members. In total, the project includes a kick-off meeting (held November 2009), six PAC work sessions and five open houses.

The remaining meeting schedule is as follows. (Note, meeting dates and times are subject to change.)

*PAC Meeting #2 * – September 30, 2010*
- Discuss draft chapters of the issues and goals, inventory, and draft forecast (Chapters 1,2 and 3)

*PAC Meeting #3 * – December 2, 2010*
- Discuss the draft facility requirements chapter (Chapter 4) and identify possible development alternatives

*PAC Meeting #4 * – February 1, 2011*

- Evaluate the draft airport alternatives (Chapter 5)

*PAC Meeting #5 * – June 9, 2011*

- Discuss the draft ALP and CIP (Chapters 6 and 7)

*PAC Meeting #6 * – July 14, 2011*

- Present the Final Report

** All meetings will occur on Thursday nights. Immediately following these PAC meetings, there will be public open houses to cover the same topics of the PAC meeting (the first open house will cover the topics of both meeting #2 and meeting #1).*

Introduction to Master Plan Goals and Issues

The Master Plan goals will be used in the Plan as a means to create and evaluate development alternatives. They also set the tone of the report. WHPacific gave examples of what the goals may be, such as safety, operational efficiency, public acceptance and protection from incompatible land uses. Issues are identified to help direct the effort to the things that are most important to resolve in the Plan. Regarding issues, WHPacific reported on the issues heard at the kick-off meeting and what was submitted on the airport user surveys. Issues from the kick-off meeting related to runway length, calm wind runway designation, air traffic control tower, precision approach, noise, public outreach, surface transportation planning and land use planning. The major issues identified in the user survey are the following: build an air traffic control tower (25 for, 3 against), lengthen runway, add precision instrument approach, change calm wind runway back to 17, improve airport roads and address traffic issues, and provide public sewer and water facilities.

PAC Discussion of Goals and Issues

Goals for the Plan, as stated by PAC members:

- Jim Hansen – Would like to see by the end of the process (directly or parallel) a clear vision statement defining what the Airport will be like in the foreseeable future (30-50 years) that is embraced by stakeholders in terms of safety, noise, development scale and flavor. The Plan's preparers need to get really high quality, great information about actual operations at the Airport and relationship of the Airport and economic growth. Is there a way to make sure the plan is really implemented?

- Steve Hurst – Consider all areas of impact: service area definition. Goals should be established, not foregone. Proceed in good faith. Measure supply and demand equally. Just because there is demand for something, we are not required to supply it.

- Nick Kaiser – Consider livability for airport neighbors. Traffic issues and noise must be considered.

- Tony Holt – All communities need to be listened to and their points of view taken into account.
- Jim Meirow – Property between airport and Aurora should be considered. The airport will grow and we need to know where it is going. Consider the impacts of an air traffic control tower.
- Jim Bernard – Look at what impacts the airport would have versus the cost of addressing those impacts and include Oregon Department of Transportation (ODOT) costs for roadway improvements.
- Fred Netter – Consider the additional load put on the fire district (FD) that may occur as a result of expansion. FD has very little control over what happens at the airport, but is responsible for it. Why pay (community) to subsidize what's happening at the airport? FD must have ability to cover the airport. These costs should be included in the Plan. We have heard safety is #1, as it is for the FD. However, expansion has an impact associated with it on our equipment.
- David Waggoner – Inside the fence: safety and safety only. Outside the fence: give a careful look at how the investment will play out (benefits vs. costs).
- Bruce Bennett – The Plan doesn't direct or drive the economy. Safety is first, which includes runway length. The plan needs to determine what the actual need at the Airport is for runway length. The Plan should include integration with other systems, *i.e.*, fire suppression system.
- Patty Milne – Keep issues separate and don't mix issues. Stay focused on the Plan and its process. Twenty years is a long way out, and while there are issues today, we must consider the future.
- Dan Riches – Safety first. The airport has to be responsive to the needs of airport business users.
- Mitch Swecker – Safety. Everybody should come to the table with an open mind.
- John Henri – Safety at the Airport and look at the safety of city/county streets and roads. Must look at all of the transportation infrastructure needs. Does airport expand to whatever it wants to be or should there be constraints to its growth?
- Roger Kaye – Agricultural lands are very important to the community. Worried how the increase of airport traffic will impact the farmers and farming operations. Should not forget the Salem airport needs protection, too.
- Ted Millar – As we go forward, remember the Airport is important in the National Plan of Integrated Airport Systems (NPIAS). The Airport's location on I-5 is ideal and the Airport needs to service the communities. An airport grows to provide services. The Airport is a reliever to PDX (*note, it is not an FAA designated reliever at this time*). Corporate aviation is very important for large companies. Provide future growth potential for efficient business operations.

- Jim Bernard – The Airport has impacts to air transportation, not just road traffic.

Issues at the Airport were then discussed:

- Scott Starr – First there are questions about air traffic volume, will status quo be maintained? What is the capacity of the planes? Are there going to be any airspace changes?
- Bruce Bennett – Runway length and strength limits some operations. Zoning is necessary to protect the Airport. Agriculture is a good neighbor for the Airport.
- Tony Holt – In the last Plan noise was taken out and done separately. We need to discuss noise in this Plan. Forecasting: there is absolutely no way to track operations. Starting a forecast without historic data is difficult. How will it be accomplished?
- Rick Kosta – Deer Creek was established circa 1972. At that time Aurora was a smaller airport. Noise is a concern.
- Jim Bernard – Operations volume, frequency, and traffic direction is of concern. Will growth limitations be considered, as with the IGA between ODA and other entities? Clackamas County is impacted and that isn't being addressed. There are also through-the-fence concerns.
- Steve Hurst – Reaffirming that hopefully we'll be able to collect good information to make a true plan. Measure demand accurately.
- Fred Netter – As for collecting data, we need to come up with is what has happened safety wise in the past. What has/hasn't worked at other airports and Aurora?
- Rick Kosta – Reference to the IGA. To ODA: why would ODA sign an IGA at a time when we are trying to expand participation?
- John Henri – These processes do work.
- Craig Wilmes – An air traffic control tower is for safety and involvement with all stakeholders is key for the process and economic development.

Summary and Next Steps

WHPacific will prepare drafts of the Issues and Goals (Chapter 1), Inventory (Chapter 2), and Forecasts (Chapter 3) and submit to ODA, PAC and FAA. ODA must receive FAA approval of the Forecast Chapter. The next PAC meeting will cover the first three chapters, tentatively set for September 30. The PAC meeting will be from 5:30 – 7:00 pm and the open house from 7:00 – 8:00 pm.

The Positive Aurora Airport Management (PAAM) groups meet on Thursday mornings, and it was requested the meetings be moved to another night of the week. However, for County Commissioners and City Councilors Thursday nights work best. All future meetings will be held on Thursdays.

Public Comments

The following public comments were given:

- Will the Plan consider the balloonist a safety issue?
  - No, balloonists have a right to the airspace in accordance with FAA regulations.

- Has ODOT and the Counties been invited to these meetings?
  - Yes, they have been and will continue to be invited.

- I've been through planning processes before and this is a good process. Airplanes are getting quieter.

- What is WHPacific's experience and what are they being paid?
  - Rainse Anderson has worked as an airport engineer and at the Aurora Airport since 1977. In total, he has worked on over 300 airport planning and engineering projects in the Pacific Northwest. Sara Funk has over 20 years of planning experience throughout the United States and brings a breadth of knowledge to the plan. Sarah Lucas has worked at WHPacific as a planner for four years, prior to that she was a planner for ODA and the Nebraska Aeronautics Division, and has been a commercial pilot for eight years. The fee for the Plan is $306,149.46 (includes sub-consultant work).

- Canby should be involved in the process.

- Clackamas County has committed to keeping the area south of the Willamette River rural. Part of this was due to the cost in upgrading the infrastructure to meet industrial demands. The freeways are for freight, not commuters. What is the Airport's acreage footprint going to be set at? Charbonneau was planned in 1970 and was always planned to be the size it is today and it has never grown outside those boundaries.

- How are the forecasts going to be completed?
  - The forecasts are completed by studying existing demographic and population forecasts for the area, in addition to national forecasts. There are strong correlations between population and specific demographic statistics to indicate airport activity at general aviation airports like Aurora State.

Meeting Adjournment

The meeting adjourned at 8:40 pm.

Aurora State Airport Master Plan & Airport Layout Plan Update – Planning Advisory Committee Meeting #1

July 22, 2010
Charbonneau Country Club
6:00 – 8:45 p.m.

SIGN IN SHEET

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Aurora State Airport Master Plan & Airport Layout Plan Update – Planning Advisory Committee Meeting #1

July 22, 2010
Charbonneau Country Club
6:00 – 8:45 p.m.

SIGN IN SHEET

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SAF CANJA	EAA 902	32415 SW ESTATES POST RD	97070	503 694 6383 CANJAS@PeopleP C.COM
David R Johnson	me	8535 Curry Dr. Unit C	97078	503 525-5329 david.johnson.640@gmail.com
Jim Austin	Clack Co	~~39~~ 9705 1 KAEN ROAD O.C.	97045	jimaus@co.clackamas.or.us
Jim Hansen	Tenants of Airport	5916 Southbrook Dr LO OR	97035	503 307 3161 james.n.hansen@me.com
Sandra Larsen	ODA	3040 25th St SW Salem OR	503-378-2894	sandra.larsen@state.or.us
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Aurora State Airport Master Plan

Planning Advisory Committee (PAC) Meeting #2

September 30, 2010
American Legion, Aurora, OR

MEETING SUMMARY

Attendees

Oregon Department of Aviation – Chris Cummings, Sandra Larsen, John Wilson, and Mitch Swecker (also a PAC member)

Oregon Aviation Board – Mark Gardiner

WHPacific – Rainse Anderson, Sara Funk, and Sarah Lucas

JLA Public Involvement – Adrienne DeDona and Sylvia Ciborowski

PAC – Bruce Bennett, Jim Bernard, Jim Hansen, Tony Helbling, John Henri, Susie Stevens (for Tony Holt), Steve Hurst, Nick Kaiser, Rick Kosta, James Meirow, Ted Millar, Patti Milne, Fred Netter, Dan Riches, Roger Kaye, Ray Phelps (for Scott Starr), and Dave Waggoner

Public Attendees – See attached sign-in sheets

Opening Remarks

The meeting commenced at 5:10 pm, with welcoming comments from Chris Cummings. Mark Gardiner, Oregon Aviation Board Chairman, also spoke; outlining recent policies adopted by the Board and dispelled misconceptions surrounding the Aurora State Airport (Airport) and the Master Plan process. The policies are:

Aurora State Airport Mission

Consistent with the 2000 Master Plan, the 2007 Oregon Aviation Plan (both endorsed and approved by FAA), and consistent with the direction in the current Master Planning effort, the Oregon Aviation Board re-affirms that the mission of the Aurora State Airport is and will remain a general aviation airport serving business and personal aviation.

Aurora State Airport Tower

The Oregon Aviation Board re-affirms that an air traffic control tower at Aurora State Airport is a critical aviation safety facility, as determined by the 2007 Tower study and by

FAA approvals of the tower and that, therefore the Aurora tower remains the Oregon Aviation Board's highest priority capital project. The Board further affirms that all federal, state and local regulatory processes will be followed in planning and developing the tower.

Presentation

The purpose of the PAC meeting was to review and discuss Draft Chapters 1 (*Introduction*), 2 (*Inventory*), and 3 (*Aeronautical Activity Forecasts*). The WHPacific planning team gave a presentation, which is outlined below. Comments from the PAC were taken during the presentation, while public comments were taken after the PAC working session had ended.

Schedule

Approximately 10 months are remaining. The process allocates review periods for ODA, FAA and PAC prior to each public meeting. To date, one public kick-off meeting and one PAC work session have been conducted. After tonight four PAC work sessions and four open houses remain. The next PAC meeting – with a public open house to follow – will be to discuss draft Chapter 4, *Facility Requirements*, and to identify possible airport development alternatives. It is tentatively scheduled for December 9, 2010.

Chapter 1

Chapter 1 covers the following topics: planning process goals, master plan goals, issues to be addressed within the plan, and airport role analysis.

Goals were discussed at kick-off meeting (November 2009) and the first PAC meeting (July 2010) and will guide the conduct of the ODA, ODA's consultants, and the PAC throughout the development of the master plan update. Planning process goals are:

- Be open-minded and proceed in good faith.
- Keep the focus more on the long-term future than the short-term future.
- Don't mix unrelated issues and don't be sidetracked by issues that don't relate to the master plan.
- Obtain high quality information for analysis.
- Seek consensus for solutions that are acceptable, helpful, and clear.
- Establish a clear vision statement that defines what the Airport will be like in the foreseeable future (30 to 50 years) and that is overwhelmingly embraced by all stakeholders. The vision statement should encompass safety, noise, and development scale and flavor.

Master plan goals should guide the future development of the Airport; when it is time to evaluate alternative layouts for airport development, the goals should be the evaluation criteria.

- Goal 1: Enhance safety.
- Goal 2: Meet the current and projected needs of airport users, as feasible.
- Goal 3: Consider all the off-airport impacts of Airport development; minimize negative impacts and maximize positive impacts.

Issues were a subject of the kick-off meeting and first PAC. Other sources for issue identification were ODA and an Airport user survey that was conducted in the fall of 2009. The issues are intended to be a method "checks and balances" throughout the planning process, to ensure the Plan addresses issues important to the airport users and community.

- Runway Extension
- Air Traffic Control Tower
- Impact of Airport Expansion on Surrounding Areas
- Calm Wind Runway Change
- Precision Instrument Approach
- Helicopter Operations
- Other Airport Improvements

In addition to goals and issues, Chapter 1 discusses the appropriate role of the Airport. It was determined the Aurora State Airport fits well the Oregon Aviation Plan (2007) description of an Urban General Aviation Airport.

The Airport's role in the future should not change from its current role—a busy airport handling a full range of general aviation, including helicopters and business jets. Mulino State could be utilized if personal use and recreational aircraft want to relocate to a less busy airport where the other aircraft are smaller and slower.

Aurora State Airport is not an FAA-designated reliever airport for Portland International. The Airport could be officially designated a reliever in the short-term future, if ODA decides to pursue the designation and the FAA agrees.

Aurora State Airport should continue to fulfill its role as an Urban General Aviation Airport. The advantages and disadvantages of becoming a reliever airport should be discussed with the ODA, Port of Portland, and FAA.

Chapter 2

The inventory chapter discusses existing facilities at the Airport, including: airfield facilities, landside facilities, support facilities, land use and zoning, and environmental.

Airside facilities include:

- Runway. Runway 17/35 is 5,004 feet by 100 feet.
- Taxiways and Taxilanes. Runway 17/35 full-length parallel taxiway (Taxiway A), 35 feet wide. Five taxiways connect Taxiway A to Runway 17-35.
- Aprons and Aircraft Parking.
    - State-owned property = 46 tiedown positions.
    - Private property = 37 tiedown positions with additional aprons for large aircraft parking.
- Airfield Lighting. Medium intensity lighting system.
- Visual Approach Aids. The Airport has three forms of visual approach aids.
- Two-box Visual Approach Slope Indicator (VASI) located at each runway end

- Runway 17 has both an Omnidirectional Approach Lighting System (ODAL) and Runway End Identification Lights (REILs).
- Instrument Approach Aids. Both Runway 17 and 35 have instrument approach procedures, which can be used when the visibility and cloud ceiling are below minimums for Visual Flight Rules (VFR) conditions.

Landside facilities include:

- Land. Airport Property vs. Airport Environs. Airport Property references property owned by the State of Oregon. The term Airport Environs is used to describe both public and private lands used for aviation-related uses.
- Hangars and Other Buildings. 89 buildings (Airport Environs)
- Aviation Services. Three fixed based operators (FBOs)
- Access and Vehicle Parking. Fencing surrounds the perimeter of the Airport Environs. All access points are gated - not all are automated. Private businesses at the Airport use a colored gate system to assist in emergency response and advertisement.
- Emergency Services. The Aurora Rural Fire Protection District provides fire protection, with a recently installed 500,000-gallon fire suppression system. Clackamas County Sheriff Department and Oregon State Police provide emergency services.
- Utilities. Utilities and public services provided at the Airport include:
- Water – Individual well system
- Sanitary Sewer – Individual drain field / septic tank systems
- Telephone – Local franchise companies
- Electricity – Portland General Electric

Land use and zoning. The existing land use and zoning at and surrounding the Airport was discussed (refer to Exhibit 2F).

Environmental Inventory. Environmental constraints for airports typically fall into two general categories: human environment and natural environment.

- Human factors include existing settlements and incompatible land use, noise, social or socioeconomic conditions, light and glare, and the general controversial nature of airports.
- Natural environmental elements include various aspects of air quality, water resources, fish and wildlife, hazardous materials, energy and other resource issues.

The FAA considers public controversy to be an environmental issue. Additional study regarding noise, threatened and endangered species, cultural resources, and possibly hazardous materials should be conducted once a project is defined.

Noise contours will be produced for the Master Plan study to assess the compatibility of land uses around the Airport with current and future levels of aircraft noise.

Chapter 3

Aeronautical Activity Forecasts are 20-year projections of activity (demand) to help plan the type and sizing of airport improvements. The Aurora State Airport forecasts are unconstrained by

current facilities. ODA may elect to constrain demand when facility needs and development alternatives are considered later in the planning process.

In the last 15 years, general aviation in the U.S., in Oregon, and at the Airport grew until 2008, when decline resulted from the economic recession and high fuel prices. From the turn of the century through 2007, the Airport's based aircraft grew due mainly to the growth at Southend Airpark, movement of aircraft from other "jet capable" airports, and strong economy. Declines in fuel flowage and instrument flight plans were recorded in 2008. In 2009, instrument flight plans declined, but fuel flowage grew. Instrument flight plans are growing in 2010.

About ¾ of Airport activity is associated with Clackamas and Washington Counties (based on population, pilots, instrument operations).

Historical records show 5.3% average annual growth in based aircraft at Aurora from 1998 (233 aircraft) to 2010 (432 aircraft).

Change in market share at "jet-capable" airports in the region, 1998 – 2007:

- Aurora - 21% to 32% (share of jets from 11% to 38%)
- Hillsboro - 35% to 27% (share of jets from 69% to 47%)
- Troutdale - 16% to 15% (share of jets from 6% to 3%)
- McMinnville - 10% to 10% (share of jets from 3% to 2%)
- Salem - 18% to 16% (share of jets from 11% to 10%)

Number of based aircraft at these five airports increased from 1,119 to 1,220 (jets from 35 to 88).

Based aircraft forecast models vary from 0.4% to 3.1% annual growth. Preferred forecast is 1.36% annual growth, resulting in 566 aircraft in 2030, an increase of 134 aircraft. Preferred forecast averages regional population and employment forecast growth rates and is consistent with growth projected by Airport businesses. Some change in fleet mix is forecast over 20 years: jets grow from 5% to 9%, helicopters grow from 8% to 10%, single engine airplanes decline from 72% to 66%.

Since 1998, total annual operations (operation = takeoff or landing) have varied between 66,821 and 90,180. Average historical ratio of based aircraft to operations is 232, consistent with Airport user survey conducted in fall 2009. Operations forecast models vary from 1.1% to 3.1% annual growth. Preferred forecast is based on 232 operations per based aircraft, which equates to 1.9% average annual growth. Operational fleet mix shows higher performance aircraft (jets and turboprops) are used more often than single engine aircraft, consistent with Airport user survey results. Over 20 years, jet operations are projected to grow from 13% to 18% of total operations, and single engine airplanes to decline from 33% to 29%.

Critical aircraft is the most demanding aircraft that regularly uses the airport (at least 500 annual itinerant operations) – can be a "family" of aircraft. The critical aircraft determines Airport Reference Code (ARC), which identifies appropriate FAA airport design standards. ARC is a letter

representing aircraft approach speed and a Roman numeral representing aircraft wingspan/tail height. ARC for current and future activity at Aurora is C-II (exemplified by Israel Aircraft Industries Astra 1125 now and by Cessna Citation X in the near future).

Summary of Aeronautical Activity Forecasts

Forecast Element	2010	2015	2020	2030
Based Aircraft	432	462	494	566
Aircraft Operations	100,224	107,227	114,720	131,312
Critical Aircraft	IAI Astra 1125	Cessna Citation X	Cessna Citation X	Cessna Citation X
ARC	C-II	C-II	C-II	C-II

PAC Comments

The following comments were provided by members of the PAC during the presentation.

- Susie Stevens – Cite the sources along with information, add language about physical constraints in regards to feasibility, change "evaluate" to "involve" on Goal 3. Also wanted more information on the user surveys and pointed out the difference between random and scientific surveys.
- Jim Hansen – Remove citation of 1,500' extension being desired by some users, as he's not heard that number before. (Note: several PAC members raised their hands when asked if anyone knows if 1,500' is needed by some operators.) Add extending the runway overruns. An air traffic control tower may decrease operations in the smaller planes.
- Bruce Bennett – The drainage ditch on state property needs to be filled and paved for safety. He also recommended the Airport not grow past Hwy 51, Airport Road, Keil Road, and Arndt Road; the zoning on the other side of the roads should be protected.
- John Henri – Added that adjacent lands should remain as EFU (exclusive farm use).
- Fred Netter – If adjacent lands are kept as EFU, owner must be compensated.
- Roger Kaye – The use of land, especially on through-the-fence land, should be established. Are through-the-fence areas sufficient?
- Steve Hurst – Gather information and cite the source more concretely. He also wondered how this information would be used in justifying a runway extension.
- John Henri – Also had questions on how this information would be used for justifying a runway extension.
- Fred Netter – Chapter 2 states that Aurora is within walking distance; however, the road is unsafe for walking as it has narrow shoulders. As for the calm-wind runway designation, he said more people want it kept as is. He also questioned why the Airport is designated as an "Urban General Aviation Airport" if SB 680 was designed for rural airports.
- Patti Milne – Clackamas County Sheriff provides service for emergencies of regional and statewide significance. Marion County Sheriff provides emergency services for typical emergency response, as well as Oregon State Police.

- A PAC member thought the pavement condition index was incorrect and that some taxilanes are closer to "poor" than what is designated.
- Statewide Resource Planning Goal 5 allows an entity to constrain growth to a boundary.
- UT-20 (as shown on the land use exhibit) is Urban Transitional, not Urban Transportation.
- Jim Hansen – Add discussion about new departure procedures. (Note: ODA reported they are working with FAA to finalize this and are hoping to have it completed within the next couple of months.)
- Bruce Bennett – Noise is important and bigger airplanes don't necessarily make more noise, because of advances in turbofan technology. There are published noise reduction procedures.
- Steve Hurst – Adjacent farmland is "Foundation" farmland according to the Oregon Department of Agriculture. He also questioned discrepancies in historical operations counts.
- Nick Kaiser – Airport is 1/3 mile from Aurora city limits. He also added another point of view that some people feel the airport needs to grow within certain constraints.
- Susie Stevens – Vehicular traffic will increase with bigger airplanes.
- Fred Netter – Vehicular traffic issues should be separated from the Airport aircraft operations issues.
- Nick Kaiser – Questioned the forecast numbers, especially the validity of the historical data.
- Bruce Bennett – There has been a lot of growth in the last ten years and there is no vacant land left.
- Tony Helbling – The recent increase at the Airport is artificially high, because many operators moved from Hillsboro, for example, since there was private property available to develop.
- Susie Stevens – Asked to have the Terminal Area Forecast link out on the website. She also questioned the reasoning behind selection of the Preferred Forecast.
- Steve Hurst – We need to have reliable numbers.
- Ray Phelps – We need Washington County vehicular traffic counts.

Public Attendees Comments

- Marlow Treit submitted written testimony, which is attached. The overall sentiment of the testimony states that an air traffic control tower is not needed at the Airport.
- Regarding the air traffic control tower, it must be justified by operations and is for the purpose of safety.
- Jets at the south end of the Airport are a cause of concern.
- A Charbonneau resident was told by her real estate agent that only small airplanes operate at the Airport, and the noise is much worse than they expected.
- Early morning operations and disturbances at Charbonneau are unacceptable.
- The recent accident near the Airport has neighbors concerned. How can we guarantee something like that won't happen again? These are adults and shouldn't need someone in an air traffic control tower telling them where to go – a tower wouldn't have avoided this accident.
- Touch and goes are scary for neighbors.

- Most neighbors knew about the Airport when they moved there, but growth has been greater than they expected.
- A pilot said he uses the Airport 3-4 times a year and he – like most pilots – wants to fly neighborly.

Meeting Adjournment

PAC members were asked to submit their comments on draft Chapters 1-3 within two weeks. The meeting adjourned at 7:15 pm. A public open house followed, and a summary of that event is attached. All information regarding the PAC meeting and open house – along with comment forms – is posted at www.aurorastateairport.org.

Aurora State Airport Master Plan

Open House Summary

September 30, 2010

Prepared by:
JLA Public Involvement
For WHPacific & Oregon Department of Aviation

Public Involvement and Outreach Overview

The Oregon Department of Aviation (ODA), with assistance from WHPacific, is conducting a master plan update for the Aurora State Airport. The purpose of this update to the 2000 Airport Master Plan is to assess the role of the Aurora State Airport, evaluate the Airport's capabilities, forecast future aeronautical activity for the next 20 years, and plan for the timely development of any new or expanded Airport facilities needed to accommodate future aviation activity.

ODA obtained and matched a grant from the Federal Aviation Administration (FAA) to fund this study. ODA has organized a Planning Advisory Committee (PAC) comprised of airport users and neighbors to participate in the planning process. In addition to six PAC meetings, other public outreach opportunities include regular project website updates to disseminate information and gather comments and questions, and five public open houses. The first open house was held in conjunction with the second PAC meeting on September 30, 2010 from 7:00 p.m. to 8:00 p.m. at the American Legion, located at 21510 Main Street in Aurora.

The drop-in style open house featured several display boards exhibiting information on the master plan update process and project schedule as well as information regarding the first three draft chapters of the Master Plan Update, including:

- Goals for the planning process;
- Goals for the future development of the Airport;
- Major issues the plan should address;
- The Airport's current and future role within the system of airports;
- The Airport's background, including existing airfield and landside facilities, airspace, land use and zoning, environmental issues, and historical aviation activity and financial data; and
- The types and levels of aviation activity expected at the Airport during a 20-year forecast period.



Staff from ODA and WHPacific were on-hand to answer questions and collect comments.

Public Information and Outreach

The public was invited to attend the open house and/or submit comments online through the following venues:

- Press release distributed to local media outlets.
- E-mail distributed to the "interested parties" list-serve.
- Announcement posted on the project website: www.AuroraStateAirport.org
- Flyers posted at a variety of locations around the community, including:
    - Columbia Helicopters
    - Willamette Aviation Office
    - Aurora Aviation, Inc.
    - Van's Aircraft
    - Sky Iron Café
    - White Rabbit Bakery
    - The Colony Pub
    - Lunch Room
    - Pheasant Run Wine Tasting Room
    - Old West Colony Kitchen
    - Antique shop
    - Two local market/grocery stores

Overview of Public Comments

Public comments were collected via comment forms and flip charts at the open house. Members of the public were invited to submit comments online in addition or in lieu of attending the open house.

Nearly 50 people attended the PAC meeting and open house. The overall response received from community members was pessimistic but constructive. Participants who provided written comments and who chatted with staff were concerned about noise impacts and recent accidents related to take offs and landings at Aurora State Airport. A few people provided input on the draft Master Plan Update chapters being considered. Many participants voiced their appreciation for having the opportunity to provide feedback.

Three people commented on the noise impacts and offered some solutions, including a noise reduction wall and regulations for helicopter traffic. Three people provided specific feedback regarding Draft Chapters 1 – 3. Some of these comments referred to physical constraints, transportation impacts, using proper references, and general clarification of terms. One person commented on the recent airplane crash in Piper Court and inquired about how the master plan might identify how this could be avoided. One person provided a written letter in opposition to the control tower being proposed by the ODA.



Open-Ended Comments from Comment Forms

Six written comments were collected from participants via comment forms. Two participants submitted letters (see attached).

- Lower noise. Put up a noise reduction wall.
- In Chapter 2, with regard to noise control, please include regulations and rules for helicopter traffic as it tends to overfly Aurora Historical area at low levels, creating excessive noise.
- Goals: Airplane crash at Piper Court (midfield)—how could this be avoided?
  Of the 400 planes based at Aurora, how many are at the 30,000 wt? Are any at 45,000 wt?
  Deer Creek is less than 1,000 feet from the south end of the airport – noise – livability – quality of life are very important to the 141 homes, approximately 425 people.
  Loud operation – take off – lands
- The second goal in Chapter 1 is to meet the needs of current and projected users, as feasible:
  - What is the current need?
  - Who are the projected users?
  - Isn't the notion of who projected users are a self fulfilling prophecy?

  Chapter 3 notes the intersections with Arndt Road north of the airport are already projected to fail in 2015.
  - Does the ODA plan to address surface transportation impacts in this master plan? If so, how? When?
  - Did any of the improvements identified in the Marion County Transportation System plan get built?

  How do the PAC members and the public get access to the surveys and other documents on which WHPacific bases the conclusion in the report?
  Chapter 3 says the Airport Reference Code will be changed from B-II to C-II and the reference jet is a citation X because a single airport user is buying one. Why? How will that affect the decision on runway length and strengthening?
  Chapter 2 – Emergency services should say who provides mutual aid for police and fire.
  91% of the population around the airport is in Clackamas County. How is it that Clackamas County is not part of the IGA?
- Thank you for keeping us posted on the progress!
- Page 1-3, change "evaluate" to "involve"
  Page 1-3, strike "1,500'" extension, not talked about by users, add recommendations for off-site improvements, i.e. roads. Troutdale Airport is in Multnomah County, not Washington,
  To have accurate forecasts, you must have forecasts of future growth of industry that may need airport! Also of population that may want airport services.
- Emergency services inventory should detail Mutual Aid agreements
- [Vehicular] traffic counts are not the same as a traffic study – need this
- Will there be an overhead noise study?
- Fill and pave drainage ditch on state property

Aurora State Airport Master Plan Update – Planning Advisory Committee (PAC) Meeting #2 & Open House

September 30, 2010
American Legion
PAC Meeting 5:00 – 7:00 pm
Open House 7:00 – 8:00 pm

SIGN IN SHEET

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Aurora State Airport Master Plan Update – Planning Advisory Committee (PAC) Meeting #2 & Open House

September 30, 2010
American Legion
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Aurora State Airport Master Plan Update – Planning Advisory Committee (PAC) Meeting #2 & Open House

September 30, 2010
American Legion
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Aurora State Airport Master Plan Update – Planning Advisory Committee (PAC) Meeting #2 & Open House

September 30, 2010
American Legion
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Aurora State Airport Master Plan Update – Planning Advisory Committee (PAC) Meeting #2 & Open House

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Sept 30 2010

Oregon Dept of Aviation
Master plan meeting

Subject- Air traffic control tower

For the sake of history, I was involved with the 1976 Master Plan that had the footprint for the tower included.
For the last 35 years I have been a user of the Aurora Airport, a fixed base operator, aircraft owner and land owner.
The basis for having a tower is simple. Improved safety. There must also be enough aircraft movements to justify it and have the funding to build it. Next the tower must be manned during the hours that the traffic would require management.
History shows us that the number of aircraft movements were at their height in the late 1970's early 80's.
The State Board of Aeronautics, at that time part of ODOT, had a device that they leased or rented the recorded the sound of aircraft using the runway. Those numbers were used for further development of the airport by the State. Since the downturn of aviation due to many aspects of the economy, the aircraft movements have never reached the level that was achieved in the "hey day" of aviation as we know it.
During the "hey day" we were told that somewhere between 150,000 and 175,000 movements were recorded per year. This was published information from the State Board of Aeronautics. A movement is a take off or a landing. The airport had a number of fixed base flight schools plus instructors who worked with students but not in a flight school. The VA was paying for students to become commercial, multi-engine, instrument rated, flight instructors. The operators could expect 90% of the cost to be paid for by the government in GI bill education funds. This created a tremendous customer base for the operators. That funding is gone and the cost of aviation training is now born by the student. And at this time, the number of students is minimal compared to that time period.
It was not uncommon for there to be as many as 12-20 aircraft in and out of the pattern all day on good flying days. No tower and no accidents.

This is where we are today. There has not been an accurate count of aircraft movements for years. The number of aircraft based here is up but the number of operations is no where near where it was in the past. The operations have changed dramatically with about 20% of the operations being piloted by professional pilots in business aircraft. These pilots have a much better safety record than a recreational pilot. The "see and be seen" method of governing the traffic with a common frequency to monitor has worked well and I feel will work into the future. To my knowledge there has not been an accident at this airport that a tower would or could have prevented. In the 35 years that I have been here, I have seen the results of a number of accidents, but not one of them would have been prevented by a tower operator. We have not had an air to air accident and the majority of the ground incidents are not within the towers control.

Having been a landlord here with over 50 rental units, I have seen many pilots move their aircraft out of the Port of Portland airports just to be away from the hassle of a tower. The 80% training and recreational pilots here do not need nor use the tower services.

So, just because the funds are available to install the tower and it is in the master plan should not justify its installation. The cost of manning it and maintaining it will be passed on directly to the user. This will be another tax and another level of government that this airport and its tenants should not be burdened with at this time. Our tax dollars should be spent on boosting the economy, not adding to the tax burden of any one group.

Marlo Treit
23123 Airport Rd NE
Aurora Or 97002

COMMENT FORM

Concerns of Concern with Chapters 1-3 of Draft Aurora State Airport Master Plan Update

By Tony Holt, Chair, Civic Affairs Committee, Charbonneau Country Club
September 27, 2010

General

Chapters 1-3 have been written prior to any discussion with the PAC. This is a clear attempt to lead the discussion in a predetermined direction.

There are obvious constraints to development and expansion of this airport (only one runway, bordered by roads on four sides, limited remaining areas for development within the footprint). Yet there is no discussion of constraints.

ODA has already picked a preferred activity level forecast prior to any discussion with the PAC.

Points under Chapter 1

Page 1-2 Goal 2 Heading says "where feasible" This section needs to recognize the physical constraints to airport expansion such as one runway, bordered by roads on four sides, limited areas remaining available for development within the footprint, etc.

Page 1-3 First bullet, change word "evaluate" to properly describe the meaning of this bullet---including assessing the effect of any proposed changes on the livability of airport neighbors. Add bullet-a proper noise study is required to measure potential impacts of proposed developments. Runway Extension paragraph-- Please provide proper attribution to the many statements loosely made in this paragraph. Air Traffic Control Tower paragraph—again, need proper attribution for statements made.

Page 1-4 2nd para "Airport neighbors are----" Add 'and their quality of life' to this sentence. Calm Wind Runway Change section. Need to explain this move has never lessened the noise over Charbonneau so to revert to 17 is not a major concern. Other Airport Improvements for complete transparency, need a list of individuals interviewed and an explanation of how they were chosen.

Page 1-5 2nd Section, first sentence. How has Aurora Airport suddenly changed from a **rural** GA airport to an **urban** GA airport? Note: the Oregon 'Through the Fence Bill only applies to rural airports.

Page 1-7 2nd para the 14,186 IFR operations does not seem to tie to the graph on page 3-10

Page 1-14 6th para-error-Troutdale is not in Washington County. Para 7-again refers to it as an urban airport.

Page 1-16 4th para- refers to 79,953 operations at Aurora on a 10 year average. This calculation needs to be carefully explained to the PAC.

Points under Chapter 2

Page 2-7 4th para, second last sentence-"complaints from neighboring Aurora have dropped---" should note that they have not dropped at Charbonneau which now suffers the wide spectrum of jet take-off noise.

Page 2-9 last para-the PAC needs to properly understand how the current annual operations number quoted of 87,345 was arrived at.

Page 2-11 3rd para should also quote the Oregon Department of Agriculture study classifying areas as either Foundation or Important or Conflicted farmland. The area around the Airport is classified as Foundation farmland.

Page 2-14 3rd para-"Other Issues" traffic impacts should be mentioned.

Page 2-15 Table 2D Operational Records. The PAC needs to know how this was developed.

Points under Chapter 3

Page 3-1 1st para, 3rd sentence-"These projections are unconstrained and assume ODA or others will be able to develop the various facilities necessary to accommodate based aircraft and future aircraft operations." This is a fatal flaw in the conclusions so far. Constraints to growth must be considered in producing an accurate operations forecast(s).

Page 3-5 last para, the statement that oil prices will not exceed $100 before 2025 is ridiculous given the limited supply of new sources of petroleum and increases in demand once the current worldwide recession is over. What is the source?

Page 3-9 Exhibit 3C Historical Aircraft Operations at Aurora State Airport. On the following page they admit this is an estimate, but how was it compiled?

Page 3-10 Exhibit 3D It is hard to believe that out of supposedly 90,000 total operations at Aurora in 2009 only 5,000 were IFR!!

Page 3-15 Based Aircraft Forecast-explain how various forecast models were developed and the preferred one selected.

Page 3-22 3rd para- the FAA's Terminal Forecast is mentioned frequently. What is it, how is it developed and explain how it is relevant.

Page 3-29 last para-"The airport has now passed the 500 operations threshold for Aircraft Approach Category C". How do we know??

The following sections were prepared earlier. There is some repetition.

Statements made without attribution

Chapter 1

--"PAC members who are airport users fear community concerns will unduly constrain growth."

--"Some airport users report there are times that they must lessen their airplanes weight in order to depart---"

--"Some Airport users and businesses favor a runway extension of up to 1,500 feet." (but not mentioned in the survey)

--"Airport neighbors are concerned that a runway extension would unduly disrupt the area and encourage more and louder aircraft."

--Re changing calm wind runway back to 17, "noise impact would move with traffic, a concern for Airport neighbors."

Chapter 2

Page 2-14, "There are some members of the community who are against airport growth and desire closure of the Airport and release of the land to other uses." Who are they??

Unclear statements

Chapter 1

One goal is "evaluate all communities and jurisdictions in the Airport's influence area." Meaning?

When did Aurora Airport go from being classified as a Rural General Aviation Airport to an Urban General Aviation Airport.

Chapter 2

"An accurate inventory helps produce an aviation demand forecast---"

Missing or misleading

Chapter 1

-They want to "determine" Airport's future role rather than predict it.

-No discussion of possible constraints to growth such as one runway, hemmed in by roads, current zoning, etc.

-No mention of livability of airport neighbors as goal.

-An MP goal should be to predict demand as accurately as possible.

-An MP goal should be to evaluate potential noise and traffic impacts for any new development.

-Should list which individuals/organizations responded to the survey?

-Should list which individuals/organizations were interviewed?

-How do the Oct 2007 to Oct 2009 IFR numbers on page 1-7 fit with Exhibit 3D, page 3-10?

-Page 1-16 says the average operations at Aurora from 1998-2008 were 79,953 operations; how calculated and isn't this meaningless?

Chapter 2

Page 2-7, "Complaints from neighboring Aurora have dropped since this designation (calm wind 35) was enacted." Maybe, but not from Charbonneau.

Page 2-9, Under 'Human Factors' and 'Noise' talks about noise sensitive land uses and says "the number of noise sensitive land uses is minimal' because the majority of the adjacent land is in agricultural use.

Page 2-11 under 'Farm Preservation' should also reference the Oregon Department of Agriculture study.

Page 2-14 'Conclusion' "Beyond controversy over noise and airport expansion, there do not appear to be any significant environmental issues on the Airport or in the airport vicinity." What about traffic??

Chapter 3

All activity forecasts presented are unconstrained; that is unrealistic.

Page 3-5 the oil price prediction needs references as to source/basis. As a former oilman, I would say, given the future supply demand equation, the prediction is totally unrealistic.

Page 3-10 Exhibits 3C and 3D indicate that of an estimated 88,000 operations at Aurora in 2008, only some 5,800, or 7% were IFR. That seems unrealistic.

Page 3-29 How do we know "the airport has now passed the 500 operations threshold for Aircraft Approach Category C, so the current ARC should be C-II"? What proof?

Tony Holt

September 27, 2010

Aurora State Airport Master Plan

Planning Advisory Committee (PAC) Meeting #3

December 9, 2010
Canby Adult Center, Canby, OR

MEETING SUMMARY

Attendees

Oregon Department of Aviation – Chris Cummings, Sandra Larsen, John Wilson, and Mitch Swecker (also a PAC member)

WHPacific – Rainse Anderson, Sara Funk, and Sarah Lucas

JLA Public Involvement – Adrienne DeDona and Sylvia Ciborowski

PAC – Bruce Bennett, Jim Bernard, Jim Hansen, Tony Helbling, John Henri, Tony Holt, Mark Ottenad (for Steve Hurst), Nick Kaiser, Rick Kosta, James Meirow, Ted Millar, Patti Milne, Fred Netter, Dan Riches, Roger Kaye, Ray Phelps, and Dave Waggoner

Public Attendees – See attached sign-in sheets

Welcome and Introductions

The meeting commenced at 5:15 pm, with welcoming comments from Chris Cummings. He introduced Oregon Department of Aviation (ODA) employees and the WHPacific consulting team.

Presentation

The purpose of the PAC meeting was to discuss the PAC comments received on Draft Chapters 1 – 3, as well as present information in Draft Chapter 4 (*Facility Requirements*). The WHPacific planning team gave a presentation, which is outlined below and posted to the project website (www.aurorastateairport.org). The PAC made comments during the presentation, and public comments were taken after the PAC working session had ended.

Schedule

Approximately eight months are remaining. The process allocates review periods for ODA, FAA and PAC prior to each public meeting. To date, one public kick-off meeting and two PAC work session have occurred. After tonight, three PAC work sessions and three open houses remain.

The next PAC meeting – with a public open house to follow – will be to discuss draft Chapter 5, *Airport Development Alternatives*.

Vehicular Traffic Counts

The Oregon Department of Transportation – Transportation Development Division placed traffic tubes at 11 access points at the Airport from 10/18 to 10/22. Additional data is being gathered and will be analyzed with data from ODOT. Data will be presented prior to the next PAC meeting.

PAC Comments – Draft Chapters 1 - 3

Time was allocated to discuss the comments received on Draft Chapters 1 – 3. Items discussed were:

Draft Chapter 1 Comments

- Roger Kaye – Is there a census of Airport occupants? Are all occupants airport-related? *An inventory of off-airport (through the fence) tenants will not be prepared as part of this project.*
- Tony Holt – How has Aurora State changed from a rural GA airport (SB 680) to an urban GA airport (Oregon Aviation Plan 2007)? *Aurora State Airport was listed as a "rural" airport in SB 680; however, the OAP also lists it as an urban airport.*
- Tony Helbling – Regarding 1.24. Do not add "some" – it is true that all PAC members who are airport users expressed this concern. *Sentence will be left as currently shown.*

Draft Chapter 2 Comments

- Fred Netter – Regarding comment 2.16 (see "Chapters" page on website), contact Jim Johnson with the Oregon Department of Agriculture. Foundation farmland is a term used in a metro study and not a legal term appropriate for Aurora. Tony Holt and Patti Milne joined this discussion. *WHPacific will research further, information gathered will be included Chapter Five,* Alternatives.
- Ted Millar – How will we see changes based on these comments? *The Final Draft, to be presented at the last PAC meeting, will incorporate changes.*

Draft Chapter 3 Comments

- Tony Holt – FAA planning advisory circular recommends both constrained and unconstrained forecasts. *The unconstrained forecasts, as prepared, were approved by FAA. The development alternatives will show options that do constrain the Airport's growth.*
- John Henri – Could you constrain the Airport in Chapter 5? *Yes.*
- Tony Holt – Why did you choose the Astra as the critical aircraft? It does not have 500 operations at the Airport. *The Astra has the most operations of C-II aircraft. The airport reference code (ARC) is developed by using families of aircraft. The Astra is most representative of C-II aircraft operating at the Airport.*

- Mark Ottenad – Why did you choose 2007 and 2009 data in determining the forecasts? *Those years represent recent peak and valley years, and an average represents a more normal year.*
- Bruce Bennett – How many operations does CSIM have in their Falcon 900? *The records were researched after the meeting. In FY 2007, documented operations for CSIM's Falcon 900 were 146 and in FY 2009, they were 123.*
- Nick Kaiser – Comment 3.23, the accuracy of operations is essential as it must have an impact on the forecasts. He would like the 62,900 operations numbers used. *No changes to will be made.*
- Bruce Bennett – Regarding a comment that the forecasts represent an operation occurring every 5 minutes, he noted this is an average and there are days when aircraft are lined up for take off.
- John Henri – Are you going to change the forecasts? *No, there are no compelling reasons to change the data presented at this time.*
- Ted Millar – People need to be aware of the impacts of the plan and we don't want to be on a camel looking backwards – we must look forward. The National Business Aviation Association guidelines must be taken into account.
- Tony Holt – What is the TAF (terminal area forecast) and does Aurora State have one? *Explanation to the TAF is given in the written comment responses. Yes, Aurora has a TAF and the airport has exceeded the TAF.*
- Bruce Bennett – Believes the forecasts are conservative.
- Mark Ottenad – Are helicopters broken out in the forecasts? *Yes, on pages 3-21 and 3-27.*
- Tony Holt – Please get the actual user surveys on the website. *WHPacific and JLA will gather the responses and post to website prior to the next scheduled PAC meeting.*
- Mitch Swecker – ODA is moving forward with finalizing departure procedures that direct traffic east and west of Charbonneau. They are planned to be published in spring of 2011.

Draft Chapter 4

The accompanying presentation outlines high points from Draft Chapter 4. The following comments were provided by members of the PAC during the presentation.

- Roger Kaye – You should defer zoning/planning discussion to Chapter 5. If were to remain in Chapter 4, there could be conflicting data. *The recommendations given would remain, regardless of alternatives presented in Chapter Five, as they are broad and conform with State guidance given in the Oregon Aviation Plan. No changes will be made.*
- Fred Netter – Zoning discussion should be able to remain, as it is only suggesting what may be needed.
- Tony Holt – Table 4B, the capacity shown isn't realistic.
- Fred Netter – Fire district need should be further explained, especially in regards to funding. The District owns the apparatus.
- Mark Ottenad – Regarding projected landside developments, how are the acreages developed? *Methodologies are explained within the chapter.*
- Jim Hansen – pg 4-25, utilities. Strike paragraph relating to development constraints. It is no longer a limiting factor, due to new technologies. *We will look into the issue by talking further with Jim and Marion County representatives.*
- James Meirow – There is a cost associated with the septic systems, so they are a constraint.

- Ted Millar – Maintenance of septic systems is expensive and you still must remove the gray water.
- Patti Milne – There should be some comment that modern technology could change the septic constraints.
- Tony Holt – Would like to request information on RPZs, RSAs, etc to the fence. *The information has been presented in Chapter 2 and will be graphically shown in Chapter 5.*
- Jim Hansen – Can an overrun area extend into a safety zone? (Overrun = RSA). *Yes, dimensions are based on runway end.*
- David Waggoner – Will the runup area to 17 be discussed in Chpt 5? *Yes.*
- Nick Kaiser – Regarding Tables 4A and 4B, why did you choose 84 degrees? *84 degrees is the mean maximum daily temperature of the hottest month, which adjust standard conditions with those at the Airport*. Page 4-14, what is ADG? *Airplane Design Group (ADG) has significance with regards to design standards. It is the Roman numeral in the Airport Reference Code.*
- Tony Helbling – Page4-26, title notices. Suggests extending area out to 5 miles (similar to tower notice). *There is no legislative authority to do so. ODA has promoted title notice statewide and will continue.*
- Nick Kaiser – 1 mile would go into Aurora (title notice), what happens today? Is there a title notice? *No, but ODA would like to see something like this occur.*
- Patti Milne – There are similar title notices for agricultural uses.
- Fred Netter – Notices could open ODA up for liability. It is a two-edged sword.
- Nick Kaiser – Relating to ATCT. How is the BCA developed? *The FAA develops it based on TAF data.*
- Bruce Bennett – Regarding Table 4A, one of the aircraft is based at the Airport. Many airports in Oregon have a longer runway than Aurora State.

Potential Development Alternatives

Chapter 5 will present four alternatives and with the assistance of the PAC, ODA will develop a "Preferred Alternative." The Preferred Alternative may be a combination of features from more than one alternative. A no build alternative will be presented, along with three development alternatives. The development alternatives will likely show different approach minimums, which will impact design standards, and at least one will show a runway extension. Discussions with the PAC yielded the following comments:

- John Henri – How will acreage be addressed in the alternatives?
- Bruce Bennett – Aren't precision approaches unattainable at Aurora?
- Fred Netter – Please do research as to where the fire station is most appropriate.
- Jim Hansen – LPV (localizer performance with vertical guidance) approaches are better than instrument landing systems. We should maximize their usage.
- Dave Waggoner – A run-up area to Runway 17 should be shown.
- Ted Millar – Can the helicopter landing areas be between the runway and taxiway (for approach and landing)?
- Tony Helbling – What Ted is talking about is referred to as "spots". Many airports have them and then helicopters can hover taxi to parking. There is a difference between a heliport and a helipad.
- Jim Hansen – Can the power lines be in the RPZ?

Public Attendees Comments

After the PAC comments were completed, the public had an opportunity to discuss the information presented. The comments given were:

- While doing the forecasts what job growth numbers were used? *Metro (2009) low to high range.*
- Airport disclosure must be detailed (*i.e.*, a neighbor with one cat is very different than a neighbor with 30 cats).
- Page 4-23. Add "life" to fuel tanks, third paragraph.

Meeting Adjournment

PAC members were asked to submit their comments on draft Chapter 4 by January 3, 2011. The meeting adjourned at 7:40 pm. A public open house followed until 8:00 pm. All information regarding the PAC meeting and open house – along with comment forms – is posted at www.aurorastateairport.org.

Public Open House

An open house was held from 7:40 to 8:00 pm. Members of the consulting team and ODA were available to discuss questions and concerns with attendees. One comment was submitted, which was "*Buying a home in proximity to an airport should be an informed decision. However, facing expansion of an airport can't be factored into a home purchase. Growth isn't necessarily good. Your approach is to provide for bigger and more. You know that building the tower will change the mix of planes in a manner that is detrimental to the surrounding property owners, but that doesn't seem to be an issue for ODA.*"

Aurora State Airport Master Plan Update – Planning Advisory Committee (PAC) Meeting #3 & Open House

December 9, 2010
Canby Adult Center
PAC Meeting 5:00 – 7:30 pm
Open House 7:30 – 8:00 pm

SIGN IN SHEET

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Jim Bernard	Clackamas County			

Aurora State Airport Master Plan Update – Planning Advisory Committee (PAC) Meeting #3 & Open House

December 9, 2010
Canby Adult Center
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Open House 7:30 – 8:00 pm

SIGN IN SHEET

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Aurora State Airport Master Plan Update – Planning Advisory Committee (PAC) Meeting #3 & Open House

December 9, 2010
Canby Adult Center
PAC Meeting 5:00 – 7:30 pm
Open House 7:30 – 8:00 pm

SIGN IN SHEET

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GREG LEO	City of Wilsonville	9315 Clutter Rd. Aurora, OR 97002	(503) 804-6391	GREG@theleogroup.com

Aurora State Airport Master Plan Update – Planning Advisory Committee (PAC) Meeting #3 & Open House

December 9, 2010
Canby Adult Center
PAC Meeting 5:00 – 7:30 pm
Open House 7:30 – 8:00 pm

SIGN IN SHEET

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MIKE MCCUE		21131 MAIN ST NE AURORA		
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Aurora State Airport Master Plan

Planning Advisory Committee (PAC) Meeting #4

March 10, 2011
North Marion Intermediate School, Aurora, OR

MEETING SUMMARY

Attendees

Oregon Department of Aviation (ODA) – Chris Cummings, Sandra Larsen and Mitch Swecker (also a PAC member)

WHPacific – Rainse Anderson, Sara Funk, Sarah Lucas and Casey Storey

JLA Public Involvement – Vaughn Brown, Adrienne Dedona and Sylvia Ciborowski

Public Advisory Committee (PAC) – Bruce Bennett, Jim Bernard, Jim Hansen, Tony Holt, Steve Hurst, Nick Kaiser, Rick Kosta, James Meirow, Ted Millar, Fred Netter, Dan Riches, Ray Phelps, Charlotte Lehan (for Jim Bernard), Craig Wilmes and Dave Waggoner.

Public Attendees – see attached sign in sheets

Welcome and Introductions

Chris Cummings, ODA, introduced himself and welcomed everyone to the meeting. He noted this meeting had the best public turnout so far.

Chris reviewed the meeting agenda, explaining there would be a presentation from WHPacific prior to breaking out into a public workshop. After the workshop, the PAC will reconvene for a discussion of the alternatives. Chris instructed participants to ask as many questions as possible during the workshop and indicated that there is also the opportunity to provide written comments.

Rainse Anderson, WHPacific, introduced himself and provided an overview of the study to date. He noted that at previous meetings he had told members several times to hold their comments until we review Chapter 5. Rainse explained that Chapter 5 and the draft alternatives is what we've been building up to. He said reviewing and discussing the draft alternatives in order to develop a preferred alternative is the most exciting and important part of the study. Rainse asked the remainder of the consultant team to introduce themselves and reminded everyone to sign in. He drew attention to the comment form and let people know this would be a helpful guide when reviewing the draft alternatives.

Rainse reviewed the agenda further and explained there would be a review of the forecast updates, traffic analysis and the draft alternatives prior to the public workshop. He also said there would be a discussion of the alternatives with the PAC, and at the end of the meeting, there will be time for public comments.

Presentation

Project Overview: Rainse reviewed the project purpose and explained that there are seven (7) chapters total in the Master Plan Update. The first four draft chapters have been completed and draft chapter 5 will be reviewed tonight. Following completion of the document, the draft will be submitted to FAA for review. This process typically takes 90 days prior to final publication. After this meeting, the project team will take the feedback received and begin developing the preferred alternative. The draft preferred alternative will include a public review and comment period. Once that is completed, the Airport Layout Plan (ALP) and the Capital Improvement Plan (CIP) will be developed. The ALP and CIP will be the topics for review and discussion at the next PAC meeting; tentatively scheduled for the end of June.

Traffic Analysis: Rainse said that at the first PAC meeting there was a discussion about vehicular traffic and since that time, the project team has done some analysis to look at traffic coming from and around the airport. He explained that this data was gathered from various available sources. ODOT traffic specialists were enlisted to conduct counts around the airport. Data was gathered at 11 of the gates in during a 1 week period to determine the average annual daily traffic (AADT) and peak hour traffic volumes. The result was 2,400 AADT. Located at the NE corner, Columbia Helicopters generates 47% of the total traffic (1,130 AADT). Rainse explained that this is not a typical Fixed Base Operator (FBO) tenant since they don't use the runway. The traffic analysis included HTS (Helicopter Transport Services), under construction on the corner of Keil and Airport Road, and projected 211 AADT once developed. On Airport Road itself, 2007 data shows that approximately 2,600 vehicles travel along the road between Ehlen and Arndt Road. Rainse mentioned that this data is somewhat low; when it is updated in 2011, it's expected to increase. The data will be updated by studies completed by Marion County later this year. Rainse went on to explain that there is a lot of pass-through traffic going to and from I-5. He added that the impact from the airport on the Boone Bridge was also analyzed and it was determined that the airport generates about 1.5% of the total traffic on the bridge. Currently the employment numbers at the airport are approximately 750 employees, which equates to 3.2 trips per employee. Once a 1.19% annual employment growth rate is applied, the total employment for 2030 is 950 employees, equating to an airport generated AADT of 3,040. Rainse added that additional data and background information on the traffic analysis can be found in the report and could be discussed further during the workshop session.

Traffic Analysis Recommendations: Rainse said that ODA will continue to work with Marion County and the City of Aurora as improvements to Airport Road are considered and the appropriate considerations will have to be made with regard to airport businesses and entrances along Airport Road. He added that it is likely that there will be sharing of the costs in the system development, similar to what HTS did with their system development, but this will need to be worked out between the entities.

Forecast Updates: Chris explained that the previous meeting scheduled for February was postponed because of incorrect forecast information that needed to be corrected. There was an error with previous information related to the number of aircraft based at the airport. To remedy the problem, ODA checked with tenants, sent someone out to physically count aircraft in hangars (if able), and thoroughly reviewed their database of registered aircraft. Chris said there are now new numbers and those numbers have gone down from the original count. He said this information was used to go back and correct other information previously developed in the report. Chris said that he is very confident with the count and the new forecast.

Sara Funk said that while they were doing revisions based on the aircraft count, they completed other revisions, such as:

- Information from the FAA's Terminal Area Forecast (published in December 2010).
- Comments received from the PAC previously were addressed
- Additional research was done related to the Airport Reference Code (ARC). The project team looked up what kind of airplanes there were that were previously reported as unknown.

Sara reviewed the past and current numbers of aircraft based at Aurora, including the new projections for 2030 (based upon a 1.58% annual average growth rate).

Year	Aircraft Type	Revised Forecast	Previous Forecast
2010 Historical	Single Engine	261	312
	Jets	23	21
	Multi-engine	40	59
	Helicopter	25	35
	Other	5	5
	Total	*354*	*432*
2030 Projection	*Total*	*464*	*566*
	Jets	47	51

Operations: Sara explained the takeoffs and landings changed with the based number of aircraft. This number is now estimated at 90,909 for 2010. The number was previously somewhere around 100,000. Based upon the estimated annual growth rate, the revised forecast for 2030 operations is 124,386 as compared to the previous figure of 131,312.

Sara asked the PAC if there were any questions about the traffic or forecast analysis before moving on to Chapter 5. There were no questions from the PAC.

Draft Chapter 5

Sara said that the runway length surveys have been updated to reflect at least 500 constrained annual operations, which justifies a longer runway based on the FAA criteria. Besides the additional completed surveys sent to the PAC prior to the meeting, additional surveys have been received.

Tony Holt asked about the updated survey and requested to talk about it further later.

Bruce Bennett noted that Management West is still at Aurora, although the constrained jet aircraft owned by Management West is not.

Sara explained that three build alternatives have been proposed in order to meet the facility requirements.

Sarah Lucas explained that the preferred alternative would be developed based upon the elements included in the three build alternatives and the no-build alternative and the preferred alternative would be the basis for the ALP. She explained that the various elements outlined in the comment form could be mixed and matched to develop the preferred alternative.
Sarah explained the various comparative elements within the alternatives:

- Airport Reference Code (ARC)
- Runway length and strength
- Instrument approach capability
- Hangar/tiedown locations
- Cargo apron location
- Fuel tank location
- Air traffic control tower (ATCT)
- Aurora Rural Fire Protection District Facility

Approximately 40 developable acres are needed to meet the forecasted demand for the activity at Aurora. Currently ODA has about 9 acres of developable land. Development necessary for precision approach path indicators, a cargo apron, helicopter parking, vehicle parking and some additional hangars would be built on state-owned property. In all of the build alternatives, the adjacent church camp property (16 acres) is shown to be suitable for hangars and related development.

- *No-build Alternative:* The no-build alternative is ARC B-II. An air traffic control tower (ATCT) will still be constructed in this option, but a location has not yet been identified. The runway length would remain at its current length of (5,004 feet). Instrument approach capability does not change. The approach criteria minimums remain not lower than 1 statute mile. (The Runway Protection Zone (RPZ) at the end of each runway correlates to the approach minima). The pavement strength would remain the same (45,000 pounds dual-wheel gear).
  While the no-build alternative is essentially a do nothing option, it does not mean that there would be no financial impact to the airport. Most prominently, there would still be a cost associated with maintaining the current pavement and facilities.

- *Build Alternative 1:* – Alternative 1 is also ARC B-II and includes a 600 foot runway extension. The southern RPZ would extend south of Keil Road and an aviation easement would be sought. The northern RPZ would encroach into Columbia helicopters. The majority of state-owned property would be developed as hangars in this option. The state has identified three various alternatives for the location of the air traffic control tower. This alternative includes a fire station facility near the control tower. The air traffic control tower would be located midfield on the east side. Two helipads would also be built on public property. No cargo apron is included in this build alternative. Instrument approach capability does not change although the visual glide slope indicators would be upgraded to precision approach path indicators. The pavement would be strengthened to 60,000 pounds (dual-wheel gear). The fuelling tank would be relocated to the south of Aurora Aviation.

- *Build Alternative 2* – Alternative 2 increases design standards to ARC C-II. The approach minima are greater and extend RPZs further off of airport property; requiring additional easements or land acquisition. There are further impacts to Columbia Helicopters. This alternative has a fairly equal split between development of tiedown facilities and cargo aprons. The helicopter parking pads are same as in build alternative 1. The fuel facility is located near the cargo apron, northeast of Aurora Aviation. The fire station would be located near the current water suppression system, and the air traffic control tower is located near the center of the airport. The pavement would be strengthened to 60,000 pounds (dual-wheel gear). The runway and parallel taxiway would be extended to the south by 1,000 feet, which would require the closure of Keil Road (total runway length of 6,004 feet).

- *Build Alternative 3* – Alternative 3 also increases design standards to ARC C-II and shows a precision approach. The precision approach was something a lot of pilots requested during the goals and issues identification phase. There is no runway extension included in this alternative and RPZs increase significantly. The high voltage power lines would have to be relocated or put underground. The pavement strength remains the same. The helicopter operations areas are located north of the current cargo apron. The air traffic control tower is located closer to the north end and farther from the runway than in the other two build alternatives. The Fire District's building is located east of the fire suppression system. The fuel tanks would be located at the south end of state-owned property and the cargo aprons would be centrally located on state-owned property.

Steve Hurst asked if the no build option would include an air traffic control tower. Sarah clarified that the control tower is a committed project and would be built regardless, since it's already funded.

Noise: Casey Storey explained the type of noise model used and that it looked at saturated noise vs. point in time noise. He said the model accounts for more disturbances by night time noise vs. daytime noise. Casey went on to explain that they looked at the flight paths from this year and the aircraft type and mapped where those types of aircraft will fly. The flight tracks reflect the current noise abatement flight patterns and departure procedures. Casey noted that based upon the FAA criteria, residential land use is not considered compatible within the 65 dBA (average decibel) contour. Casey reviewed the noise projections for each of the proposed alternatives:

- All 2020 alternatives have the same type of and quantity of aircraft and show an increase in noise over time.
- Build Alternative 1 shows a slight bulge/increase in noise to the north due to the expanded runway.
- Build Alternative 2 contours shift south, due to the proposed southern extension to Runway 35.
- Build Alternative 3 contours remain the same as the 2020 No Build Alternative contours, since the runway configuration would not change.

Steve Hurst asked about the maps for the noise and confirmed whether or not alternative 2 was supposed show 2010 or 2020. Casey confirmed that it should have reflected 2020 and that this was a typo.

Tony Holt asked if this assumes the traffic control tower is built. Casey replied that it did not.

Mitch Swecker added that an instrument departure would be recommended for departures as well as certain flight patterns designed to keep the aircraft away from the Charbonneau area.

Tony said that he just wanted to understand what is currently in place.

Sarah explained that there are currently noise abatement procedures in place at the airport. Instrument procedures for northward departures are expected to be approved by the FAA in the fall. These procedures are in line with the current recommended noise abatement procedures for northward departures.

Tony said that he was aware of that but many operators don't pay attention to the noise abatement procedures and he asked if other flight paths were factored into the model. Casey responded that yes, they were taken into account.

Nick Kaiser said that the decibels don't change much between the alternatives and he asked if there were things that affected that. Casey explained that there is some shift based on the type of aircraft since there will be more jets in the future.

A member of the public asked what is happening to noise abatement around Aurora. Mitch replied that they've tried to change the flight pattern to avoid flights over Aurora and planes should depart to the south around Aurora.

Bruce Bennett said that he was involved with the FAA during the time they designed the airport departures/flight pattern and that they were designed to avoid Aurora.

Rainse explained that the preferred alternative would be presented to the Oregon Aviation Board later this month and then again in April for their concurrence. Chris said that he will send information out to the public about the meetings with the State.

Nick asked about the comment period for the draft alternatives. Chris said that there will be a two week comment period prior to the presentation to the Oregon Aviation Board.

Public Workshop

Vaughn reviewed the format for the public workshop and explained there would be 45 minutes for the public and the PAC to interact with staff to ask questions and review information about the draft alternatives. He recommended that participants take a comment form in order to review information and formulate their questions and comments. Vaughn suggested that participants think about the issues that need to be identified or considered when developing the preferred alternative. He said that the group will come back together after the workshop and the feedback heard will be discussed with the PAC for 30 minutes, then there will be time for public comment. If necessary, the public comment time would be extended and each person will be given a couple of minutes to provide testimony.

After the 45 minute public workshop, Vaughn reconvened the PAC session. He said he hoped that everyone had an opportunity to ask questions and obtain information from staff and PAC members. Vaughn explained that the PAC would now have the opportunity to discuss the draft alternatives and give input on the direction for the preferred alternative.

To start off the discussion on the preferred alternatives Sylvia Ciborowski and Adrienne DeDona reported out on the group discussion during the work session related to noise impacts and the draft alternatives. The following is a summary of the comments collected on flip charts at each of the information stations:

- If the runway object free area (ROFA) extends, what will happen to the highway?
- Have you considered what this project will do to the town of Aurora? Who needs this extension?
- I'm concerned about the impact of the RPZ on off-airport properties (alternatives 2 and 3)
- There needs to be consideration for the economic feasibility. There is no way this will pencil out economically. It will result in greater revenue from gas sales, but this will never cover the huge expenditure.
- I'm concerned about the impacts/development on the best farmland in the world. This farmland is more important for the future of food production than to pave over it.
- Currently the flight plan/pattern is not followed, especially at night. Planes fly right over houses and shake the windows. Concerned about the future safety and who disciplines pilots who fly in no flight zones.
- I'm concerned about the feasibility of Alternative 3.
- Can we use the additional capacity at Salem Airport rather than expand Aurora?
- The Run-up area is too close to hangars and private property (condo association) in Alternative 2. I'm concerned about the safety of this situation and the dust flying up in the area.
- What does it take to become a C-II Airport?
- I'm concerned about what will happen to the property values of nearby homes with the noise increase.
- I'm an airport user with five planes stationed in two hangars at Aurora. I prefer Alternative 1 with the 600 foot extension and ARC C-II.
- Can alternative 1 become a C-II with all other elements remaining the same?
- I have a concern about fumes from jets on people. The wind blows fumes into residential areas.
- The no-build option is no good because it does not have a fire facility. If we have a tower, we need a fire facility.
- Since we are already a volunteer fire station in Aurora, who will pay for a new fire facility?
- Can you request a modification to standards of the ROFA (on Highway 551) from the FAA?
- Why do you need more clearance for a more precise approach?
- Has ODOT gotten onboard with road improvements, especially Keil Road?
- Use displaced thresholds as a last resort. Sarah L. explained that a displaced threshold could be done to gain runway length for takeoff. The runway could be extended, but a displaced threshold, where aircraft land, would not be placed at the end of the extended runway pavement. The runway pavement behind the threshold could be used for takeoff, but not for landing. . .
- The Tower will enforce flight patterns (to reduce noise impacts to area neighborhoods) by keeping in contact with pilots by radio.
- Three to four days a week there are early morning airplane departures at approximately 3 a.m.

- Planes should not be allowed to take off before 7 a.m.
- If the current noise/flight pattern policy isn't being followed, why would a different policy be followed?
- Where is the money/funding for the project coming from? The Runway is already long enough. Enough money has already been spent on Aurora. Aurora doesn't have a lot of constraints as compared to the Orange County Airport (CA).
- The power lines at the north end of the airport should be removed or undergrounded for community safety reasons. The expense of doing so should be shared.
- An Educational Center for children should be built at the airport as well as a mechanic school in partnership with the local community colleges. A nearby playground is also a good idea so that kids could watch the airplanes take off and land.
- The area west of highway 551 will be severely impacted if the runway is extended. Farm equipment will be forced into the busy highway, creating safety concerns. Deer Creek Mobile Home Park will have limited access due to the closure Keil Road. Highway 551 will be the only point of access.
- Helicopters fly too low and are too noisy.
- The runway extension will increase the noise impacts to Deer Creek Estates. Residents already smell jet fuel. Airplanes take off as early as 4 a.m.
- Will there be any consideration for jet fumes in any of the future alternatives?
- The impervious surfaces drain to area farmlands since adequate drainage systems do not exist.
- Who enforces the noise abatement procedures? Orange County has a good noise abatement system.
- Will future zoning be amended due to the expanded noise footprint?
- The statement in the report that indicates that NW and Charbonneau residents will not be affected (related to Environmental Justice analysis) is inaccurate. There are 141 homes in the Deer Creek neighborhood. There will be quality of life impacts to residents.
- What will be done to mitigate noise from maintenance on jet engines?
- There seems to be a high number of planes flying over the Charbonneau area when there shouldn't be (based upon recommended flight patterns/noise abatement procedures).
- Mitigation efforts done simultaneously with airport improvements will help make things better for area residents.

PAC Discussion on Alternatives:

After the report out of public comments during the work session, the PAC reconvened for further discussion on the draft alternatives. The following is a summary of their comments and recommendations for consideration when developing the preferred alternative:

- Fred Netter said that his number one concern has consistently been regarding safety. He indicated that the no-build includes the tower, but not a fire station. He said that it would be his preference to have a Fire Station facility at the Airport near Airport Road and the water suppression system. He also indicated that closing Keil Road would a safety concern due to

emergency access and farming equipment access. Fred also requested that Airport Road be improved and called for Clackamas County to assist with funding for roadway improvements.

- Charlotte Lehan said that the traffic analysis doesn't recognize Clackamas County's role in surface transportation. She explained that Clackamas County's concerns are related to the surface transportation impacts and the impacts to area agriculture (industrial development pushes agriculture out). Charlotte added that Clackamas County has been excluded from some of the planning steps in this process.
- Dave Waggoner agreed that Clackamas County should be involved in funding the airport due to the positive impact the airport has on area economic development.
- Charlotte commented that the funding for the project hasn't been addressed.
- Steve Hurst asked if increased use of GPS and other technologies could be incorporated in lieu of a need for a runway extension.
- Bruce said that in order to make take off quieter, planes/pilots must use less power. To use less power, more runway is needed. This is a typical procedure for noise abatement elsewhere.
- Tony Holt said that the Aurora Airport is constrained by three major roads and only one runway. He indicated his support for the no-build alternative.
- Bruce agreed that the airport is constrained and should 'fill-in' for development. He added that agriculture and golf courses make good neighbors to airports and that no other building development should be allowed near airports.
- Charlotte requested that the financial impact to the public should be captured somehow and that Airport Road should be part of the financial analysis.
- Nick Kaiser stated that Airport Road gets 2,600 trips a day, but is listed as a collector street. It should be listed as an arterial street and should be designed as such. He added that in Alternative 2, the RPZ goes over the Deer Creek neighborhood and highway 551; this is a safety concern.
- Fred added that development in various communities impacts the airport too.
- Steve said that the Wilsonville City Council will discuss the Airport Alternatives at an upcoming meeting and will determine a formal position within the two week comment period.
- Ted Millar said that Aurora Airport is a category 2 airport and is an important part of the National Aviation System. He added that the Airport benefits Clackamas and Washington Counties (the cities of Wilsonville and Aurora). Ted commented that from a safety and an economic development standpoint, the runway should be expanded. There is an economic opportunity and that need should be filled. He called for an additional 1,000 feet of runway and increasing the pavement thickness of the runway.
- Rick Kosta stated that National retailers can land elsewhere in Oregon (Hillsboro, Portland, and Troutdale). He went on to say that the only alternative that doesn't impact Deer Creek neighborhood is the No-build. The noise impacts to Deer Creek residents in any of the build alternatives will be over 65 dB. What mitigation can be done for Deer Creek residents?
- Mitch Swecker said that before any mitigation were to occur, actual measuring of noise exposure would likely be conducted. If impacts are shown, they may be mitigated.

- Dave said that the current situation at the airport is dangerous for run-ups and that the run-up area in alternative 2 is impractical. It's too close to hangars and one of the hangars provides space for the Emergency Operations Center. There is no run-up space allocated in alternative 3. He called for alternative 2 to be modified to allow for a run-up area that doesn't crowd the hangars.
- Bruce said a greater than ¾ statute mile (sm) approach should be required; it's safer, quieter and saves fuel. He requested the minimums be lowered with a small extension to the south.
- Tony Holt asked how many of the user surveys were based at Aurora. He added that there should be a better, more rigorous way to collect/validate this type of data.
- Dan Riches said that Columbia Helicopters has reserved land for future development, so they cannot support any type of expansion to the north. He added that Columbia Helicopters supports safety improvements and improvements to Airport Road. Dan preferred the no-build or a hybrid of the no-build alternative.
- Nick said that the 2002 noise contour showed different planes, but there is not a huge difference. There has been a larger increase in the number of aircraft.
- Fred noted that expansion of the airport may impact other businesses' future plans and suggested that monetary compensation be offered to those businesses. Dan replied stating that Columbia Helicopters monetary compensation wouldn't work in their case because they are looking for a more long-term investment.

To wrap-up the discussion on the draft alternatives and to provide direction to the project team on the development of a preferred alternative, Vaughn directed the PAC to provide their individual recommendations/feedback on the draft alternatives in a round-robin fashion. The following summarizes their feedback:

- Dave Waggoner echoed his concerns about the run-up areas.
- Nick Kaiser said that there are a lot of variables within the four alternatives, especially with regard to noise.
- Dan Riches called for the no-build option or for an extension to the south.
- Steve Hurst said that he is looking forward to hearing the public comments.
- Fred Netter commented that safety is important and a Fire Station should be part of the plan.
- Ted Millar said that the Runway should be extended in addition to the thicker pavement surface. He suggested considering a possible hybrid alternative with a displaced threshold.
- Tony Holt said the no-build is the best option and that there are other airports in the area to operators to use. He feels the expansion of Aurora is not justified.
- Bruce Bennett said lengthening and strengthening the runway are important and that the overall safety of the airport should be increased. He added that the overall noise and environmental impacts should be decreased.
- Charlotte Lehan said that Clackamas County has not yet weighed in on the project and, at this time, she supports the Fire Station and the Airport Control Tower for safety reasons.
- Rick Kosta said he supports the no-build option since there are other airports in the area.

- James Meirow said that he would like to hear from the neighbors to the south of the airport.
- Craig Wilmes said he supports the run-up areas and displaced threshold.

Overall the PAC did not come to consensus on a preference for one single preferred alternative. However, there seemed to be somewhat shared support for safety improvements such as the Fire District's facility and the Air Traffic Control Tower. The consultant team and ODA will evaluate all comments and concerns received and consider them when developing the preferred alternative.

Public Comments:

Members of the public were each given two minutes to provide oral testimony regarding the draft alternatives. Several members provided written testimony in addition to or in lieu of oral testimony. Those statements are attached to this summary as separate documents.

- John Ranken, 26715 Baker Rd: He is an Attorney and consultant representing several property owners to the south. This area comprises 75 acres of properties in the EFU zone—from Airport Road to Hwy 551. Mr. Ranken was formerly the city attorney for the City of Aurora for 13 years and has been asked to help these property owners. The thanked PAC for its manner, and the public, and Chris C. for his efforts to help him get oriented to the project. He distributed information to the PAC showing the properties to the south that would be impacted. He said that at this point, their position is that they are interested in build alternative #1 since it seems to give everyone a little something. He added that this seemed to present a compromise.
- Mike Rite, NW Aircraft: Has been involved in aviation his whole life. He said he has been very involved in airport issues. Mr. Rite added that there have not been meetings in Mulino or McMinnville about expansion because no one wants to go there. He said that people are coming to Aurora because they want to be there. He said there is not as much going to Portland. Mr. Rite added that some complaints about noise will be addressed and that tower will help airplanes not go over neighborhoods as much. He indicated he supports extending the runway because it provides additional safety and will bring in other aircraft that aren't coming in currently.
- Larry Elschen, resident of Charbonneau: Mr. Elschen said he was representing Charbonneau neighbors. He presented a petition with 260 Charbonneau names on it, and indicated it should include more signatures. Mr. Elschen read from the petition (attached).
- Ken Ivey, representing a planning organization in Clackamas County. Mr. Ivey said he has heard a lot about safety and that airplanes are coming into a marginal airport, and they are choosing to create an unsafe condition. Mr. Ivey stated that these pilots have at least four alternatives within 30-40 miles that do have the infrastructure to safely handle those planes. He stated the group he represents would vote for the no-build alternative. He stated if you want to make the airport safer, direct those planes to those airports that have the infrastructure on the ground paid for, rather than asking us to shell out more money. I live near the airport, and I don't see a noisier airport and having to pay for the highway to get there.

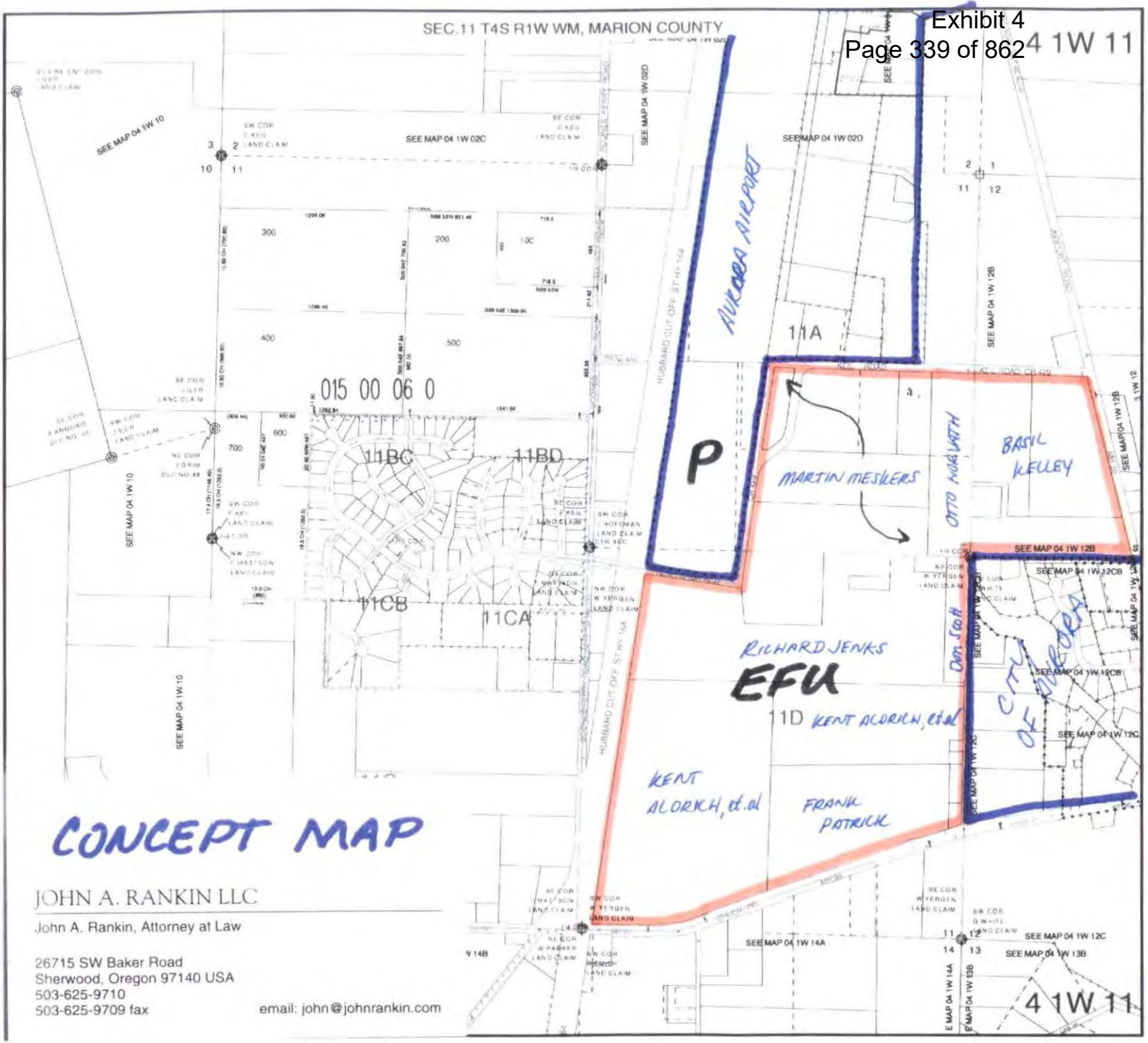
- Ailin Ottinger: Mr. Ottinger said the main thing we are doing is making it possible for more commercial flights outside of Aurora. As a taxpayer, I wonder do the corporations have any part in funding all of this?
- Ben Williams, resident of Aurora and President of Friends of French Prairie: (submitted attached written comments). He said he was concerned about preservation of farmland and the impact on surface transportation. He said, we support addressing the safety requirements, but we have a 20-30 year history of the domino effect. With improvements, it will only get bigger and we'll need more improvements. The airport is surrounded by EFU farmland that needs to be preserved.
- Jack Kaley: He said he has a commercial pilot license and has been flying at Aurora 30 years. He is also the director of Positive Aurora Aviation Management Group. He attended the first PAC meeting, and noted that most placed aviation safety as their top concern. He said that is my top concern, especially safety issue for helicopter landing areas. He went on to say that Aurora has stated safety provisions for helicopters. We need to properly separate helicopter and fixed wing areas. Helicopters take off from tie down areas that are designated for fixed wing areas. There are no designated helicopter landing and parking areas on state owned property. Because of ground turbulence, it is essential that helicopters be separated from fixed wing tie down locations. Mr. Kaley distributed some diagrams explaining the problem. He said the FAA has established safety circles and helicopter standards. The safety circles have a range. In his drawing, he superimposed a helicopter pad between a fixed wing. The projected increase of helicopter traffic means we need safe operations. In the interest of overall safety, we must provide for proper separation. The master plan should plan for safe helicopter operation. The vacant state owned land east of the helicopter blade renovation building should be used for locating several helicopter pads.
- Manuel Martinez: chief pilot for JHRD investments: He said that his company moved from PDX to Aurora State due to his recommendations. His company has provided $2 million in local revenue. He has safety concerns in operating in and out of Aurora Airport. He felt a tower would enhance the safety margins, and runway length is a concern. In his 15 years as pilot, he has had 8 close encounters, mostly near Aurora Airport.
- Larry Brons: professional pilot, flying primarily out of Aurora, doing professional contract flying: He said he supports the Air Traffic Control Tower for safety. The additional 600 feet of runway would make operations safer and more economically viable. He said we are coming out of recession and we should try to stimulate the economy in the local area by making the airport more viable for business.
- Bryan Mobey, representative for Deer Creek Estates: He said they have concerns about their quality of life. He stated now with noise and the smell of fumes from jets, it affects us drastically. They cannot sit on their patios without being disturbed by aircraft. He supports the Air Traffic Control Tower to keep planes out of no fly zones and the Fire Response Facility. He felt an expansion at the airport will negatively affect their property values due to noise and jet fumes. He added that planes take off at 4 or 5 in the morning and that nobody has control of the

planes. Salem tells us to get the number of the aircraft, but we can't get their numbers at night. He said he is concerned about an accident in the future.

- Annie Kirk, Aurora resident: She said she is representing her family. She said regarding undue hardships and compensation, I have not heard anything about outside of the fence compensation for Aurora and Charbonneau residents. For impacts to Airport Road, who will bear the burden for those improvements? The road is grossly unimproved now. It needs to be taken care of, but we have more to come. I am comfortable with the tower and the fire services for safety. But I'm not convinced that any of the alternatives resolve the interest of the communities outside of the fence.
- Lolita Carl, full time farmer in Marion County: She said she is on Marion County Board of Directors for the Farm Bureau. Ms. Carl said that farming is the number one industry in Marion County. She said she is worried about encroachment on farmland and economic development. Agriculture is the second industry in Oregon, and all of us eat. All of the land surrounding Aurora Airport is the most fertile in the world. Once we start a little bit of development, it just encourages more. As a tax payer, she wonders where the money is coming from to support so few.
- Ron Sterba: He shared his concern with the power lines on north end of airport and asked what happens if a plane hits them? Where does the power grid go to? Hospitals or schools? They should be relocated. He said he would like to see an education center on the airport to share with high schools and local community colleges. Would like to see a realignment of runway so the approach is over I-5 on the north and to take the approach corridor off of Charbonneau and move the runway 75 feet to west to allow for an expansion of the taxi way without removing any buildings.

Meeting Adjournment

Rainse wrapped up the meeting and reviewed the next steps for the project. The next meeting will cover the Airport Layout Plan and the Capital Improvement Plan. This meeting is tentatively scheduled for the end of June. Rainse reminded everyone that there will be a public review and comment period for the preferred alternative and that an e-mail notification will be distributed with this information. The meeting was adjourned at approximately 8:30 p.m.



LEGEND

LINE TYPES

TAX LOT BOUNDARY — OLD PROPERTY LINE

ROAD RIGHT-OF-WAY — VACATED RIGHT-OF-WAY

RAILROAD — RAILROAD RIGHT-OF-WAY

STREAM, LAKE, ETC. TAX LOT BOUNDARY — STREAM, LAKE, ETC. NON-BOUNDARY

SUBDIVISION BOUNDARY — PARTITION PLAT BDY

TAX CODE BOUNDARY — EASEMENT

SYMBOL TYPES

D.L.C.

CONTROL POINTS

SURVEY MONUMENTS

G.L.O. CORNERS

SECTION — 1/4 SEC — 1/16 SEC

NUMBERS

TAX CODE NO.

000 00 00 0

ACREAGE - ALL ACREAGES EXCLUDE ANY PORTION THAT MAY LIE WITHIN THE INDICATED PUBLIC RIGHT OF WAYS.

TICK MARKS - WHEN A TICK MARK IS INDICATED ON THE EXTENSION OF A LINE, THEN THE DIMENSION GOES TO THE TICK MARK. GENERALLY THIS IS USED WHEN DIMENSIONS GO INTO PUBLIC RIGHT OF WAYS.

265.00
169.00

ARROWS ARE USED WITH DIMENSIONS IN AREAS OF GREATER COMPLEXITY.

NOTICE: This map was created for Assessor's Office use ONLY.

Assessor "We Care" GIS Geographic Information System

SCALE 1" = 400'
or 1:4800

Plot file created: August 21, 2001

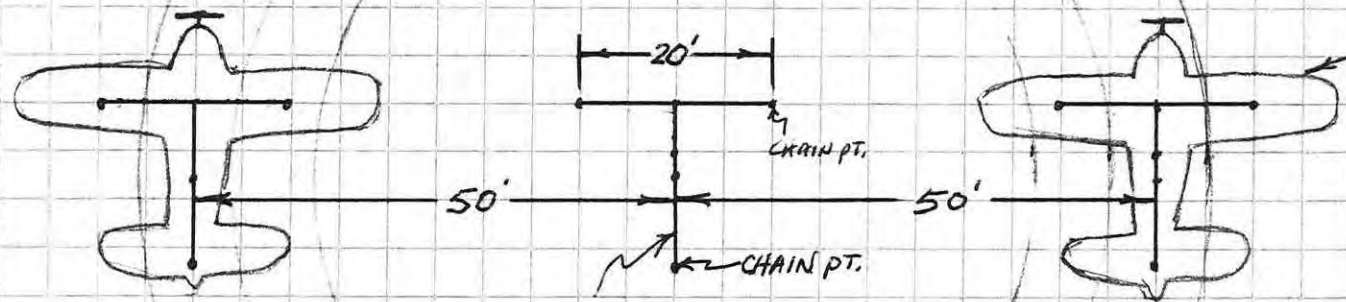
CONCEPT MAP

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AURORA STATE AIRPORT

STATE OWNED PARKING AREA FOR FIXED WING AIRCRAFT

SAFETY CIRCLES FOR HELIPADS FAA HELICOPTER STDS.			
TYPE	1	2	3
TOUCH DOWN PAD	30'x30'	20'x20'	15'x15'
SAFETY CIRCLE	110'	90'	75'



TYPICAL FIXED WING TIE DOWN AREAS.

TYPICAL SINGLE ENGINE FIXED WING AIRCRAFT. (C-182, BONANZA, SUPER CUB)

HELIPAD "SAFETY CIRCLE" SHOWN TO DEMONSTRATE SAFETY PROBLEM OF HELICOPTERS LANDING IN FIXED WING PARKING AREAS.

TYPE 3

TYPE 2

TYPE 1

JEK 2-6-11

SCALE - 1"=20'

Aurora State Airport Master Plan Update – Planning Advisory Committee (PAC) Meeting #4 & Open House

March 10, 2011

North Marion Intermediate School

5:00 – 7:30 pm

SIGN IN SHEET

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Richard Kosta	Deer creek	22073 Floral Hwy NE 97002	5036783863	Rickytrickky@Hotmail.com
MIKE IVERSON	Aurora Farms	13490 Cedarwood Rd. Aurora 97002	503-849-0662	Mikeiverson@Centurytel.Net
STANLEY F ANDERSON	SELF	21999 ENCANA DR NE Aurora 97002	503 678 2209	
BEN WILLIAMS	Friends of French Prairie	23013 Geary Ln NE Aurora 97002	503-588-5870	ben.williams@liturgica.com
BRIAN MURPHEY	DEER CREEK ESTATES	22013 LORD HWY AURORA 97002	503-678-2993	
Carol Dobbs	Self - Deer Creek Est.	13711 NE Wisteria Dr Aurora OR	503 348-2917	ddobbs@centurytel.net
Rob Graham	Aurora Planning Commission	21424 Liberty St Aurora		robbylu@yahoo.com
John Rankin	Dick Jenks & Neighboring Prop. Owners	26715 SW BAKER ROAD SHERWOOD OR 97140	503 625-9710	john@johnrankin.com
Brandon Reich	Marion County	5155 Silverton Rd NE Salem 97305	503-588-5038	breich@co.marion.or.us
Christine Wauen	myself	15777 NE Becke Rd aurora OR		
BERNICE IVEY		24780 NE PRAIRIE VIEW DR AURORA OR 97002	503-678-3383	
Manny Martinez	JTHRD INVESTMENTS, LLC	17717 NE 26th ST Vancouver Wa 98684	503-957-4891	
Retta Braun		21883 Airport Rd. NE 97002	503-678-6880	rettabr@yahoo.com
		(Historic Repre.)		

Aurora State Airport Master Plan Update – Planning Advisory Committee (PAC) Meeting #4 & Open House
March 10, 2011
North Marion Intermediate School
5:00 – 7:30 pm

SIGN IN SHEET

NAME	REPRESENTING	MAILING ADDRESS	PHONE#	E-MAIL
Bob Lebeni	himself	PO Box 928 Aurora OR	503 678.4976	blebeni@wilfair.org
Richard Waggon	Tri-Prop			admin@varicast.com
Susie Stevens	Chedonneau			sss@teleport.com
RONALD STERBA	PILOT	500 20th ST NE Salem OR 97301	503-559-3191	SAINTESTERBA@MSN.COM
Michele Lambert	Southend Airpark	14355 KELLER RD NE #71 Aurora 97002	5036786200	Mlambert@southendairpark.com
Lorraine Gonzales	Clackamas Co.		503 742 -4541	lorrainego@co.clackamas.or.us
Bob ALTEMUS	PUBLIC	2740 Summit Pl. WEST LINN	(503) 703-1482	BANDLALTEMUS@COMCAST.NET
Lisa Veber	public	22475 Bents Rd. NE Aurora	503-680-4316	lisaveber@aol.com
LINDSEY Hughes	Public	owner 14601 Arndt Road Aurora mailing 8485 sw Homewood st Portland or 97225.		lhughes@keatingjones.com

Aurora State Airport Master Plan Update – Planning Advisory Committee (PAC) Meeting #4 & Open House

March 10, 2011

North Marion Intermediate School

5:00 – 7:30 pm

SIGN IN SHEET

NAME	REPRESENTING	MAILING ADDRESS	PHONE#	E-MAIL
Richard Jenks	Self	14198 Keil Rd NE Aurora OR 97002	503-678-3221	
Keith Edmundson		32545 SW Juliette Dr Wilsonville OR (503)	694 1065	
DAN RICHES	COLUMBIA HELICOPTERS	14452 ARNDT RD NE AURORA OR 97002	503-678-1272	danrich@columbiaheli.com
Bruce Bennett	Aurora Aviation	P.O. Box 127	503-678-1217	Bruce@AuroraAviation.com
Gary Fish	DLCD	635 Capitol St NE, Salem OR 97301	503.373-0050 x254	gary.fish@state.or.us
LARRY BERGMAN	WYLEE CONDO ASSOC.	7816 SE 13TH AVE PORTLAND, OR 97202	503-572-3832	LARRY@BERGMANPHOTOGRAPHY.COM
DAVID WAGGONER	WILLAMETTE AVIATION	~~[illegible]~~		DAVE@WILLAMETTEAIR.COM
JAMES CONSTANTINE	HOMEOWNER	22602 FLORAL ACRE NE AURORA		
VIRGINIA CONSTANTINE	HOMEOWNER	" " "		
Ann Keddie	Self	31988 Stonecountry View Ln Wilsonville	503-694-2245	rlkark50@centurytel.net
RANDALL KROPF	SELF	22053 FLORAL ACRE N.E. AURORA	503-678-6359	RANDALL164@CENTURYTEL.NET
RICHARD GODDARD	WILSONVILLE CITY COUNCIL			richardgoddard2010@gmail.com
Tony Holt		7670 SW Village Green Circle W. 97070		
Siobhan Mulbery	Self/DCE	22013 NE Floral Acre Circle, OR 97002		Suzyma@nanatuy.com
PAT MULLIGAN	SELF/ODA	P.O. Box 819 Canby, OR 97013	503-702-4951	KCMULL@WORLDNET.ATT.NET
Phillip Russel	Self	P.O Box 2533, Wilsonville, OR 97070	503-780-4916	Phil@flyingkonstruction.com
MJ Cartasegue	Clackamas County	2051 Kaen Rd, OC 97045	503-742-5942	mcartasegue@co.clackamas.or.us
CRC LEO	Chair/Emeritus/Wilsonville	9318 Champoeg Road NE, Aurora	(503) 804-6391	CRC@theCrcCompany.com
DAVID BUCK	Buckets! property owner	680 Hawthorne AVE SE, #140, Salem, OR 97301	503 585 7774	dbuck@BUKTCPA.com
Rick Hardman	Self	2124 Liberty St NE Aurora Or 97004	503-526-2412	
JANET OLMSTED	SELF	8220 SW FAIRWAY DR. WILSONVILLE 97070		jdurit@comcast.net
Marilee Sullivan	homeowner	(21186 Sayre Dr.) PO Box 34 Aurora OR 97002		marilees@ipns.com
Larry Brons	Self	2024 NE 21st Ave Canby OR 97013		LEBRONS@CANBY.COM

Aurora State Airport Alternatives Public Meeting
Comment Summary

30 comment forms were submitted at the March 10, 2011 Aurora State Airport meeting. 59 additional comment forms were faxed, mailed or e-mailed in after the meeting. 13 people submitted a comment form via the online survey.

Additionally, several people submitted other comments beyond the comment form at the public meeting and by email after the event. These comments are attached at the end of this summary.

	No Build Alternative	Alternative 1	Alternative 2	Alternative 3
Instrument Approach Capability	64 No change Approach minima to remain at visual and greater than 1 statute mile (sm)	12 No change Approach minima to remain at visual and greater than 1 statute mile (sm)	16 Improved instrument approach capability. Visibility greater than ¾ statute mile (sm)	8 Improved instrument approach capability. Visibility minima lower than ¾ statute mile (sm) (precision approaches). Parallel taxiway relocated 100 feet to the east and multiple buildings removed or altered.
Airport Reference Code	65 No change Remain at ARC B-II	16 No change Remain at ARC B-II	12 Upgrade to ARC C-II	1 Upgrade to ARC C-II
Runway Length	62 No change (total runway length: 5,004')	17 600' extension to north end of runway (total runway length: 5,604')	10 1,000' extension to south end of runway, closure of Keil Rd. (total runway length:	5 No change to length. However, relocation of the parallel taxiway is necessary for
Runway Strength	69 No change - 45,000 pounds DWG	18 Strengthen to 60,000 pounds DWG	9 Strengthen to 60,000 pounds DWG	4 No change - 45,000 pounds DWG
Air Traffic Control Tower (ATCT) Location	*Has not yet been determined.*	31 ATCT located midfield on the east side.	10 ATCT centrally located within State-owned property, but north of the location in Alternative 1.	5 ATCT located closer to the north end and farther from the runway than in the other two build alternatives.

	No Build Alternative	Alternative 1	Alternative 2	Alternative 3
Helicopter Parking Location	60 No change	18 Designation of helicopter operations area in the northwest section of State-owned property.	3 Designation of helicopter operations area, situated where the fuel tanks are currently located.	4 Designation of helicopter operations area, north of the current apron.
Fuel Station Location	64 No change	13 Fuel tank relocation south of Aurora Aviation.	6 Fuel tanks relocated northeast of Aurora Aviation.	9 Future fuel tanks located at the south end of State-owned property.
Aurora Rural Fire Protection District Location	34 No change	23 Fire District's response building located near the air traffic control tower (ATCT).	35 Fire District's response building located adjacent to the water suppression system.	3 The Fire District's response building located east of the fire suppression system.
Cargo Apron Location	66 No change	10 No change	4 Designation of a cargo apron facility, north of Aurora Aviation.	9 The cargo apron centrally located on State-owned property.

Additional comments provided on comment forms:

1) The number of air operations does not justify the lengthening of the runway. I support the no build alternative with the exception of the Aurora Rural Fire District facility. I am an elected board member of the Fire District. Aurora was never intended to be a "big jet" airport. It is too constrained both in length and width.
2) For the no build alternative, determination of the location for the ATCT is a critical addition.
3) Would like C-2, but don't think closing Keil Rd. is a good idea, increases traffic on Airport Rd. Prefer 600' extension to the north.
4) No additional growth.
5) 600' extension to begin with to the North. After a term of 5 years to help replenish funds extend an additional 600' on the South end (save Keil Rd.)
6) Roads are already over capacity!
7) Alternative 2 as depicted places a RWY 17 run-up area on Wiley Condo Association property very close to existing hangars with large operable doors. This property is not for sale and is not likely to be. Consideration should be given to an alternative that includes a 600' extension with run-up area at the North end and a 500' extension at the South end to create a 60000' runway with an upgrade to ARC C-11.

8) Representing property south of airport "P" zone south of Keil Rd. Totally approximately 75 acres.
9) Since you cut the trees down the noise is louder—trees are important to clean the air. I support the tower and fire station. NO expansion. I am very concerned about how the quality of my life will decrease because of the high noise along with the value of my property which will decrease. I live in Dear Creek Estates close to the end of the now runway and in 10 years the noise has increased greatly. Plus planes flying over our home taking a short cut to the airport.
10) The removal of the trees by the west opened up more noise. I support the no build plan, the tower and fire station.
11) I am a home owner in Aurora.
12) Why don't they do something at the airport to actually get pilots of jets to fly the pattern they are supposed to?
13) Property owner
14) Remove power lines on north end. If the power lines were hit by a plane how would the loss of power to our community. Hospitals, schools, fire police. Shared costs to relocate lines underground—Power Company, City, County, and Oregon Aviation Dept. Educational building for high school students interested in aviation, shared by community colleges and education districts; 2-story building. I have additional ideas. Email me please. (Ronald Sterba, saintesterba@msn.com)
15) Comment on Helicopter Parking Location for no build alternative: already done on whose approval?
16) Aurora is one of the most significant pieces of history in Oregon. Who benefits from a larger and busier airport? Could you consider doing something in the line of keeping the integrity of this small historic piece? It doesn't lend itself to this noisy alternative. Take an example from Vermont and keep this historic jewel as the treasure it should be.
17) Any/all proposed changes need to consider/mitigate the problems that will come outside "the fence" area. Such as east-west traffic and turn lanes, drainage issues, sewer and water supplies up to code, noise and vectoring of air traffic. If the above concerns are not met there will be many irate and vindictive neighbors to deal with going forward. Not a good situation! Given present and mean time future economic situation, we are better to not overbuild especially your way for the very few – the number of operations is still highly questionable! Use your new tower to get accurate numbers prior to any further changes. Runway lengthening and Build options 2 and 3 are not warranted.
18) What is tax payer liability for under improvements of Airport Rd? For the entire expansion?
    What are impacts of expansion on adjacent properties? Zoning? Usages?
    What is the number of regular operators that live in Clackamas or Marion County?
    What will be done prior to expansion mobilization to ensure City of Aurora's annexation of Airport?
    What are the wildlife and environmental impacts? When were studies completed?
19) We have hundreds of large geese in the Charbonneau area which could pose a serious threat to aircraft and civilians. I am not concerned about the lives of the geese—only the people. We have more than enough aircraft emanating from this airport now!

20) The noise level now is too high with low flying planes and helicopters who don't seem to care that people would very much appreciate a quiet neighborhood in which to find refuge. It is unfortunate that we in Clackamas County must suffer the consequences of Marion County decisions on this matter. More planes also mean more cars and trucks on our exits and entrances to the I-5 corridor which is awful right now as it is.
21) Some Charbonneau residents are curious when we see the map showing the sound pressure level (yellow line) following the exact southern boundary of Charbonneau. Also at the DOA meeting we heard SPL/Ob numbers for aircraft on this boundry to be 65 or 75 Db. Institutions such as MIT and HUD have said that the Db for flushing a toilet is 75 Db and a business office is 85 Db. I have a hard time believing that the planes going over as we dine on our patios are more quiet than a toilet or a business office.
    We have taken a straw poll of Charbonneau residents, at a recent social function and well over 95% of us are strongly opposed to the airport expansion!
22) No more noisy planes over Charbonneau!
23) It is hard for me to believe that fuel tax would pay for all the proposed changes. As a tax payer I don't want to have any part of paying for the ability to have more corporate jets landing at the Aurora Airport!
24) I have had enough as it is of planes flying over Charbonneau. I came here from Beaverton because of the rural atmosphere and less crowding. Why must it always be ruined?
25) To approve any changes is "letting the camel in the tent!" Good, bad, indifferent—the future cannot be controlled. Surely a tower and instrument approach would improve safety but that is the camel.
26) Rw 17 run-up area on Alternative 2 is not desirable to owners of Wylee property. It would add constant noise and blast to adjacent hangars. Better solution must be found, preferably adjacent to Willamette Aviation facility on runway extension to north.
27) It is my feeling that most Charbonneau residents have little sympathy for the needs and wishes of users of the Aurora Airport, because pilots presently flying in and out of the airport just don't give a shit about avoiding the airspace above Charbonneau. Improved facilities can only mean continued disregard for the neighborhood, on a larger scale.
28) Locate ATCT at mid-field west of the highway to Hubbard. This will require land acquisition but will reduce tower height with no loss of 2 acres of airport land.
    Locate the helicopter parking in the fire suppression system area. This will totally separate helicopter traffic from fixed wing, plus make room for helicopter business and hangars.
    A reasonable return on investment should always be a paramount consideration where major investment is required. I don't feel that has happened when consideration for runway strengthening or extension is being considered. To spend millions of dollars for the possibility of a very small return on investment makes no sense, especially when both the state and federal government is broke. Lets get realistic.
29) A tower and runway extension is not so good in this climate.
30) Who wrote this? Our biggest problem is people who don't have a clue about aviation write questionnaires like this. Get someone involved in aviation to help make airport programs! You are wasting our money.
31) Justify all projects by cost.

32) The noise over our house is BAD enough as it is. I certainly don't want any increase! I wish there were no Aurora Airport at all.
33) Any changes will only benefit a small handful of users of the airport, not the general public.
34) We hope that the airport is not enlarged! There is enough jet noise now over Charbonneau!
35) Larger jets = more noise
36) Runway extension – particularly north will result in heavier noisier aircraft taking off closer (& lower over) populated areas. Noise problem. Environmental problem. Safety problem. Please do not extend runways.
37) Planes are flying over Charbonneau even though they are required not to. Expansion would only increase the noise level in this area. Think of the noise level at our Portland International Airport. We don't need to push in that direction. Thanks.
38) Aircraft coming and going creates a worsening noise problem for those of us who live in Charbonneau. Making the changes sought will only make a bad problem worse!
39) I trust you will not move north. It would be too close to a population of a growing city (Wilsonville and Tualatin).
40) See submitted letter and petition from Friends of French Prairie.
41) We are concerned about the noise level from larger jets. The hundreds of geese that flock to the small lakes in Charbonneau are a hazard to the jet engines. Longer runways bring larger planes. Larger planes bring freight. Freight needs to be hauled away in big trucks. I-5 in the Wilsonville area and beyond is the most deadly in the State. We don't need more truck traffic and congestion.
42) We hate to see an increase in the airport. Already the noise and planes flying low is very unpleasant. Quality of living in a somewhat rural area is suffering from all of this. Homes to the south would really feel this with runway extensions.
43) In as much as the Charbonneau is a heavily populated area at the southern most edge of the city of Wilsonville, every effort should be taken to not degrade the environmental and living conditions of the residents while improving or, at the very least, mitigating the physical risk to person and property. To that end, I recommend the following: 1) any fuel storage should be located as far to the southern end of the airport as possible. That provides, by physical distance, the maximum protection to the populace in the case of explosion. 2) Approach capability should NOT be lowered below the current one statute mile minimum. North-to-south approaches typically pass over Charbonneau. Lowering the approach minimum directly increases the risk to the populace by reducing the vertical distance between the aircraft and the ground in case of an in-flight emergency such as mechanical failure, bird strikes, and/or wind shear. Further, the potential for increased air traffic coupled with lowering the approach minimum directly and dramatically degrades the quality of life around the airport by increasing the noise pollution associated the lower approaches. 3) Strengthening the runway only serves to allow larger, louder aircraft to access the airport. This change will result in further increasing noise pollution and dramatically increases the risk of damage to property and person in the case of an aircraft crash. 4) Helicopter operations should be located as far away from heavily populated areas as possible. This dislocation not only affords increased protection for the populace but also reduces the noise pollution associated with these aircraft types.

44) My husband and I would like our opinion on the Aurora Airport known. I have attached a copy of the survey for the airport. As you can see we have MARKED every box in the "NO Build Alternative" column. We DO NOT want and improvements done to the Aurora Airport. We would like to see the larger jets go to another airport. The noise from the jets is extremely annoying, especially when the come screaming over the house late at night. We have lived here since 1977. We know there will be change. But we DO NOT want the airport any larger or improved from how it is now. The current JETS are loud and at times too low during landing. The size of aircraft is getting too large for this location.
45) Helicopter parking location should be in south end only.
46) From 1/14/11 to present there have been 127 flights at the intersection of Miley Rd and Airport Rd that are totally out of FAA compliance, according to the flight directory rules. This intersection is 1.6 miles from the airport.
    1. Average flight inbound is 337 yards AGL (laser sighted)
    2. All aircraft are flying in an illegal pattern
    3. Noise abatement—some cases rattle windows
    4. Number of aircraft per month is 113 flights
    5. Most critical—who at the State Department did the bird counts for possible bird strikes?
    6. Four witnesses working on counting birds including AGL and direction of flight have been monitoring morning and night
    7. Flocks of over 1,000+ to as few as 25 or 30 generally fly pattern at 020 degrees to 219 degrees. These are the biggest migration pattern for these birds. These birds are directly in the fly pattern of aircraft flying over the intersection of Miley Rd and Airport Rd.
    8. The first engine out bird strike outbound is going to land in the middle of Wilsonville Shopping Center. It is a coincidence that average AGL for aircraft is 337 yards and geese are 215 to 480 yards AGL.

    With these documentations and witnesses to what may happen in the event of a major accident, who exactly are we going to sue? All flight in and out of this airport should use the FAA directory per its rules and you will find it is pretty safe flying conditions.

Comments from Online Survey

1) I have flown into and out of 3S2/ KUAO for 14 years. The demand for greater volume of aircraft is evident, and improved operational conditions would help Aurora, the local economy and the state of Oregon, whilst improving safety.
2) I have no opinion or inadequate information on other choices, what about both extensions? Why only 60,000 pounds; many business jets today push 100,000 pounds.
3) The city believes that the Airport should be allowed to grow, But it also believes that no growth should happen outside the existing boundaries of the airport until the airport is annexed into the City Of Aurora. In talking to adjacent property owners it seems they also agree with the City. Please consider our comments in your decision.
4) Before selecting the preferred alternative, comprehensive traffic and noise impact studies on surrounding communities need to be completed. The work done on these problems to date is cursory and insufficient for the size of the projects contemplated.

Additional Comments Submitted

Bernice -

Here are some of the questions that need to be addressed along with some additonal information that you will need at the meetings that you are going to attend.

1. FLOCKS OF GEESE

Since the meeting on the 12/12/10, my neighbor, Mike Farmer and I, have monitored the geese on the approach pattern from 7:30 am to 5:00 pm. In two days the average elevation was 1100'. The flocks range from 15 to more than 200 geese in the flock. We are going to keep monitoring the geese to prove how unsafe this is for the possibility of aircraft bird stikes.

2. DO THE PILOTS FLYING IN THE AIRSPACE AROUND THE AURORA AIRPORT HAVE TO ABIDE BY REGULATIONS FOR LANDING CONFIGERATIONS AND TAKE OFFS, INCLUDNG ANY ABATEMENTS OR RESTRICTIONS WHILE FLYING IN THESE PATTERNS?

3. ARE THERE ANY RESTICTIONS AROUND THE AURORA AIRPORT THAT CONCERNS SOUND ABATEMENT? WE WOULD LIKE YOU TO CLARIFY WHAT DECIBLE READING WOULD BE TOO HIGH FOR THE HOUSING AREA THAT SURROUNDS THE AURORA AIRPORT. IS THIS GOING TO BE A FAA READING OR ONE THAT YOU ARE GOING TO APPROVE ON YOUR OWN?

4. WHAT ARE THE RULES FOR ELEVATIONS FOR AIRCRAFTS AFTER CROSSING THE WILLAMETTE RIVER ON FINAL APPROACH TO AURORA AIRPORT?

5. DON'T JETS HAVE TO FOLLOW THE SAME RULES AND REGULATIONS, INCLUDING LANDING CONFIGERATIONS, AS PER THE FAA LAWS AND RULES THAT ARE
IN COMPLETE DETAIL IN THE AIRPORT DIRECTORY THAT IS USED BY ALL PILOTS?

6. WILL THERE BY ANY REGULATIONS THAT CONCERNS "CALM WIND DAYS" WITH WINDS 10 MPH OR LESS? ALL AIR TRAFFIC, IN BOUND AND OUT BOUND, SHOULD BE TAKING OFF FROM THE SOUTH ONLY. THIS WOULD EASE SOME OF THE TENSION FOR THE THOUSANDS OF PEOPLE INVOLVED TO THE NORTH.

All the questions above clearly indicate that no one is monitoring those pilots that are violating the FAA laws. When these laws are broken, will the pilots be fined or lose their license or will a new directory be written by the Aurora Airport to fit their needs?

As of 12/12/10, we have been monitoring incoming and out going aircraft, expecially their elevations (AGL). Just as a note, on 12/15/2010, Aurora Airport manager (FBO)
was notified that at 11:16 am, 11:21 am, 11:37 am and 11:46 am, the highest elevation for a DC3 was 301 yds and as low as 257 yds above Prairie View Estates. After the call, the DC3 stopped making its practice runs.

HARLAN REETZ

I do not believe citizens or local property owners benefit from the airport improvements that are going to be adopted by this master plan. I also don't believe it makes any difference if citizen's comment with disapproval, Marion County and the ODA will give the airport whatever they decide it needs or wants.

I've watched a film of a town hall meeting, concerning the master plan, from 10 years ago. Local citizens were very disapproving of all the improvements being offered. It made no difference. Marion County commissioners have allowed unrestrained growth. Now, 10 years later, the airport claims they need a tower because of safety issues, that were brought on by that unrestrained growth. In today's financial crisis, I am appalled that our federal and state governments are funding a tower. Millions of dollars could be put to much better use than to build a tower at Aurora.

I would encourage citizens to take a look at what has happened at the Hillsboro airport. The "improvements" being adopted here are designed to promote private aviation business interests such as flight training or aviation hobbyists whose comfortable lifestyle allows them to own or rent private aircraft.

I am against lengthening or strengthening the runway, the taking of farmland for hangers or the building of a tower. Attracting bigger jets or more aircraft only benefits a small minority and diminishes livability for those who live in the area. The no build option is best for the majority of citizens. The roads are already to busy and tax payers should not have to pay the cost of road and utility improvements, that only benefit a few private aviation businesses.

The Marion County Commissioners have demonstrated their support for aviation development over the environment, livable neighborhoods or protecting farmland. Clackamas County residents have not been given equal representation even though the airport expansion and development affects us as well as Marion County citizens.

The impact would be temp, but not for making large aircraft accessible. The environmental impact of a busier facility is a detriment to agriculture and to the livability of the entire area.

March 7, 2011

To: PAC of Aurora State Airport

I am concerned with increased noise and air pollution to nearby residents and potential disturbance to wildlife in the area if airport traffic is increased and more jets begin to use the airport. The small, local airport is already here, and we accept that once in a while a small jet flies in. But we are distressed that if it is opened to more and larger jets, our quality of life and property values will be diminished.

Perhaps the addition of a tower and/or runway extension would improve safety at the airport, but the increased noise levels of more jets using the airport are problematic. Jets that are really pounding to gain altitude would definitely affect noise levels. Plus, with the smaller planes that are currently using the airport there is almost no night-time traffic--I'm concerned that with more jets, we would have more noise and increased safety risk at night. I am also concerned about the possibility of more around the clock jet cargo traffic in the future.

The FAA performs extensive noise tests on hundreds of models that fly in the United States, making generalizations difficult. However, according to figures taken from FAA records, the median decibel level upon takeoff of all models of two common small jets, Learjet and Gulfstream, at 76 decibels, is somewhat higher than those of two common small propeller plane manufacturers, Piper and Cessna, at 69 decibels. Even a small increase in jet traffic would have an adverse noise impact. *(Longmont Ledger, April 23, 2010)*

Lorna Dove, who lives in Georgetown near Seattle, has devoted extensive hours toward researching and measuring chemicals like benzene and toluene, byproducts of jet fuel and plane exhaust. Dove's strongest ally has been the Agency for Toxic Substances and Disease Registry in Atlanta, which, after conducting a risk assessment of air quality in 1998, found that Georgetown residents had "a higher risk for leukemia and thyroid cancer" than the population at large. I would like to see studies of environmental impact of increased air traffic on our area. *(The Stranger, July 2, 2008)*

Our area is called French Prairie. Let's talk about the historical significance of this area and the importance of preserving it. A larger commercial airport will undermine the agricultural character and general livability of our community.

Look at CAAP (Citizens Against Airport Pollution), a community based organization that seeks to reduce pollution caused by airport operations.

July 20, 2010

Citizens Against Airport Pollution [CAAP] has filed a lawsuit against the City of San Jose because the City recently approved a major amendment to the Airport Master Plan without an Environmental Impact Report describing what adverse affect these amendments will have on the environment.

The suit alleges that the City failed to conduct the proper environmental investigation necessary prior to the approval of a major amendment to the Airport Master Plan, as required by CEQA. Air pollution impacts, noise pollution impacts and impacts on wildlife are unknown. In an effort to avoid litigation, CAAP previously requested the City to defer action approving the major amendment so that these issues could be evaluated and discussed without litigation. The City chose to ignore these concerns and approved the major amendment to the Airport Master Plan without a clear understanding of its impact on the environment.

For over 20 years, Citizens Against Airport Pollution has been the only watchdog organization committed to protecting the environment from pollution caused by Mineta San Jose International Airport. CAAP has always supported a first class airport to serve the needs of the Southbay. Protecting the quality of life for San Jose residents and maintaining a first class airport is doable. However, it requires thoughtful planning and a keen sensitivity to environmental protections. If Silicon Valley is to become the center of "green" technology, the City of San Jose must make every effort to make its airport environmentally sensitive and a good neighbor. CAAP believes that the protection of the quality of life in the neighborhoods should be the highest priority to the City of San Jose. http://www.caap.org/

I hope the ones who finally make the decision in this matter will take into consideration the appeals of their neighbors, and not jeopardize their ability to continue living comfortably in their homes. Please slow down the premature rush to expand this airport.

Patti Oleson
7465 SW Bunker Post Ct.
Wilsonville, OR 97070

AOPA MAGAZINE - MAR. 2011

LOGBOOKENTRY | COMMENTARY

BY ROBERT E. BREILING
FOUNDER, ROBERT E. BREILING ASSOCIATES

Statistics that improve safety

Compiling business jet and turboprop accident statistics has been an objective of mine since the early 1960s. When I was a Navy carrier pilot and safety officer—and later a Pan Am pilot—I met an insurance executive who was concerned about insuring the new business jets and turboprops being bought by corporations. As I had some 3,000 hrs flight hours, I was retained as a consultant by the underwriter to visit and evaluate its operations. When Pan Am furloughed junior pilots, I went to work for the insurance underwriter to perform new-aircraft analyses, establish an engineering department, and supervise the company's fleet of 12 piston aircraft. There I began to compile business turbine aircraft statistics.



More than 50 percent of the bizjet accidents and incidents continue to occur in the landing phase year after year (for turboprops, it's 43 percent).

During this period I served on the NBAA board of directors, as head of its safety committee, and made numerous statistical presentations at Flight Safety Foundation's Corporate Aviation Safety Seminar, Bombardier's Safety Standdown, and others. I also worked with Donald Engen to establish the AOPA Air Safety Institute's light aircraft database.

I was then offered an opportunity to join the start-up team of SimuFlite, where one of my objectives was to secure an FAA exemption to use "advanced" simulators for training in lieu of aircraft. I showed the FAA that 52 business-jet accidents occurred during in-aircraft training from 1964 through 1980. We received the exemption, which benefitted both SimuFlite and FlightSafety International, the two training companies at the time. The accident rate began to fall (improve) so much that underwriters offered a reduced hull rate if companies trained in advanced simulators for both jets and turboprops. In 1985 we saw a need for this data by aviation insurance underwriters and corporate operators and began publishing our *Annual Business Turbine Aircraft Accident Review*, where we identified by specific aircraft the accident rates, phase of operation in which the accident occurred, causal factors, and other pertinent information.

In review of this data over the years, we found several dominant trends. For example, more than 50 percent of the bizjet accidents and incidents continue to occur in the landing phase year after year (for turboprops, it's 43 percent). Surprisingly, 76 percent of the jet accidents occur on 5,000-foot or longer runways, 10 percent on 4,000- to 5,000-foot-long runways, and 8 percent on runways shorter than 4,000 feet. Sixty-five percent were in VMC, and 24 percent were on contaminated runways. It is obvious that pilots are not adhering to positive landing techniques. They continue to land long, add a few knots to V_{REF}—which is already 30 percent above stall speed—"grease it on," delay reverser use, and use positive braking.

With respect to turboprops, accidents in the approach phase are higher with 17.6 percent occurring here, versus 7 percent in bizjets. My opinion is that many approach accidents involve single pilots, where it is apparent that the pilot gets to minimums and, being unfamiliar with the missed approach procedure, goes lower or performs an improper missed approach. I might add that single pilots have a 50-percent greater accident rate than aircraft flown by two pilots.

Single-engine turboprops, mostly flown by single pilots, are involved in a higher number of high-altitude upsets than other turboprops. It seems apparent that pilots are over-relying on the autopilot and when a malfunction occurs, loss of control follows. More instrument flight proficiency and upset training may be necessary.

Also noted over the years is that the number of reported incidents is increasing, and many result in serious damage. It is interesting to note that a turboprop can land gear up, and cause serious damage, yet this is classified as an incident—whereas a light jet can experience a gear collapse while taxiing, causing relatively light damage, and it is classified as an accident.

We believe that our annual reviews are invaluable to any bizjet or turboprop operator to aid in identifying specific aircraft problems, support the fact that short runways should not be used, and illustrate how business aviation safety compares to charter air taxi, fractionals, airline operations, single-pilot involvement, et cetera.

We publish the review annually and offer the complete study, including turbine helicopters, for $375; the jet section or turboprop section can be purchased separately for $175 each. For more see our website (www.breilinginc.com) or call us at 561-338-6900. AOPA

From: RobrtC@aol.com [mailto:RobrtC@aol.com]
Sent: Monday, March 21, 2011 3:03 PM
To: christopher.cummings@state.or.us
Cc: Anderson, Rainse
Subject: Comment: Aurora State Airport Master Plan

I attended the meeting earlier this month but unfortunately could not stay for the public comment portion that was begun at the end of the meeting.

One of the questions I have and I posed it to several people at the breakout session: Why is the Aurora Airport the subject of expansion when McNary Field is 20 miles away and has an existing longer runway than Aurora? Most of the responses to my questions were "convenience and closer to downtown Portland". I think that the overall public may be better served by exploring the options of McNary Field in Salem instead of embarking on this costly expansion.

If this expansion at Aurora proceeds the State of Oregon needs to impose stringent and enforced noise abatement procedures for the surrounding neighborhoods. This would mean monitoring by the control tower of violators and the imposition of fines and or license suspensions for pilots of aircraft that do not comply. To help with noise abatement the arrival/departure flight path from/to the north should be directed over the I-5 corridor and not Wilsonville.

Lastly, has an environmental impact study been conducted as to the affects of wildlife on airport operations. This area of the Willamette valley is a

large flyway for Canada geese. Wouldn't this be a safety issue?

I would appreciate your thoughts on my comments.

Rob Callan

7260 SW Fountain Lake Drive.

Wilsonville Oregon. 97070

Adrienne DeDona

From: Joel Joslin [joelandlynell@mac.com]
Sent: Monday, March 21, 2011 10:23 PM
To: Adrienne DeDona
Subject: Aurora Airport

Dear Adrienne,

Thank you for taking the time to listen to the residents concern about the proposed expansions to the Aurora airport.

I live nearby in an area that is supposed to be a "no fly" zone. It is anything but. We have planes flying over frequently and sometimes very low.
Low enough on occasion that I am concerned they are in distress and are about to crash.

An expansion would only increase these problems with the addition of increased jets and larger planes in the area and the subsequent noise issues.

It seems there are enough larger airports in the vicinity already with PDX and Hillsboro, both with greater activity and facilities than here.
Please do not turn this area into another large airport and all the noise and safety issues that would go with it.

Keep us safe and quiet!

Thank you for taking our welfare into your consideration.

A local resident and neighbor of the Aurora Airport.

Lynell Cooper-Joslin
Charbonneau

I, Kenneth W. Hawken agree with the proposal noted below. Please add my name to the petition.
my address :
24751 NE Prairie View Dr.
AURORA, OR 97002-9545
Phone 503-678-2280

Aurora Airport Master Planning Process
Petition to the Oregon Department of Aviation
from
Aurora Airport Neighbors in the Prairie View Community

Whereas, the Aurora State Airport lies less 1 1/2 miles south of the Prairie View residential community and over-flights of Prairie View are already frequent and noisy and

Whereas, the Oregon Department of Aviation is considering the possible inclusion of an extension of the existing runway and/or strengthening the runway to accommodate heavier aircraft in the current master planning process,

We, the undersigned residents of Prairie View support the petition from Charbonneau residents and express our grave concern about the number of larger jets that such an extension would bring, with the resultant increase in noise pollution for neighboring communities. We oppose such action for the following reasons:

1. At this airport, landings to the south require jets and others to fly low over dense residential areas of Wilsonville and surrounding communities. The proposed control tower, operating only during daylight hours, will not be able to fully mitigate this problem.

2. The environmental impact of a runway extension or strengthening, bringing additional and larger jet traffic, will be to reduce property values for many Wilsonville residents including those living in Charbonneau and Prairie View.

3. The extension proposed is sought by a very small number of operators, most of whom regularly use its current runway. At a time of extreme State and Federal budget difficulties it is unacceptable to consider spending large sums of taxpayer money on development to benefit so few special interests.

4. This Airport is constrained on all sides by roads and residences, by one runway, and by private infrastructure close to the taxiway and runway, all hampering long term expansion. For example, it is not practically possible, nor financially feasible, to reduce the approach minimums, something that would make the Airport a more reliable destination in bad weather. If a longer runway is required in the region this should be done at a rural area airport with many fewer constraints, such as Mulino.

For all the above reasons we request that consideration of a runway extension and/or strengthening the weight-bearing load of the runway at Aurora Airport be postponed to allow study of the most appropriate location and timing for such developments and any extension or strengthening be excluded from the current Master Plan update.

To who it may concern, we agree with the proposal below.

Stanley P. Kaveckis
25031 NE Prairie View Drive
Aurora, OR 97002

Suzanne M. Kaveckis
25031 NE Prairie View Drive
Aurora, OR 97002

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Petition to the Oregon Department of Aviation
from
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Louisa Farmer
25089 N.E. Prairie View Drive
Aurora, Oregon 97002

Michael Farmer
25089 N.E. Prairie View Drive
Aurora, Oregon 97002

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Petition to the Oregon Department of Aviation
from
Aurora Airport Neighbors in the Prairie View Community

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For all the above reasons we request that consideration of a runway extension and/or strengthening the weight-bearing load of the runway at Aurora Airport be postponed to allow study of the most appropriate location and timing for such developments and any extension or strengthening be excluded from the current Master Plan update.

I, Karen J. Hawken agree with the proposal noted below. Please add my name to the petition.

My address:
24751 NE Prairie View Drive
Aurora, OR 97002
Phone 503-678-2280

Aurora Airport Master Planning Process
Petition to the Oregon Department of Aviation
from
Aurora Airport Neighbors in the Prairie View Community

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For all the above reasons we request that consideration of a runway extension and/or strengthening the weight-bearing load of the runway at Aurora Airport be postponed to allow study of the most appropriate location and timing for such developments and any extension or strengthening be excluded from the current Master Plan update.

I agree with this proposal:
Dana Stephens
14550 NE Mulligan Ct.
Aurora, OR 97002

Aurora Airport Master Planning Process
Petition to the Oregon Department of Aviation
from
Aurora Airport Neighbors in the Prairie View Community

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For all the above reasons we request that consideration of a runway extension and/or strengthening the weight-bearing load of the runway at Aurora Airport be postponed to allow study of the most appropriate location and timing for such developments and any extension or strengthening be excluded from the current Master Plan update.

I agree with the proposal noted below and would like to add the following:

As a tax paying citizen, it is appalling to me that millions are going to be spent to build a tower at the Aurora Airport. It is obvious the ODA at the State of Oregon and the FAA will promote private aviation business interests over those of neighboring property owners. Marion County should not legally be allowed to expand the airport when it affects the residents of Clackamas County without equal representation. Sitting on an advisory committee outnumbered by airport business interests is not representation.

IT IS THE SPECIAL INTERESTS OF A SMALL MINORITY THAT BENEFITS BY DIMINISHING THE RIGHTS AND LIVIBILITY OF PROPERTY OWNERS.

Christine Warren
15777 NE Becke Rd
Aurora, Or 97002

Aurora Airport Master Planning Process
Petition to the Oregon Department of Aviation
from
Aurora Airport Neighbors in the Prairie View Community

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BERNICE IVEY
24780 NE PRAIRIE VIEW
AURORA, OR 97002

Petition to the Oregon Department of Aviation

from

Aurora Airport Neighbors in the Prairie View Community

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For all the above reasons we request that consideration of a runway extension and/or strengthening the weight-bearing load of the runway at Aurora Airport be postponed to allow study of the most appropriate location and timing for such developments and any extension or strengthening be excluded from the current Master Plan update.

I agree with the proposal noted below.
Victoria Arck
24035 Butteville Rd, Aurora, OR 97002

>if you want to send me the petition, I will sign it. The points
>addressed are significant and will affect all tax payers. Even 'tho
>I live quite a distance from the A/P I am concerned!
>Vik

> > Aurora Airport Master Planning Process
> >
> > Petition to the Oregon Department of Aviation
> >
> > from
> >
> > Aurora Airport Neighbors in the Prairie View Community
> >
> >
> >
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> >We, the undersigned residents of Prairie View support the petition
> >from Charbonneau residents and express our grave concern about the
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> >resultant increase in noise pollution for neighboring communities.
> >We oppose such action for the following reasons:
> >
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> >at Aurora Airport be postponed to allow study of the most
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> >
> >=

We agree with the proposal noted below:
Hellen Safronchik
15651 NE Browndale Farm Rd,
Aurora, Oregon 97002

Paul Safronchik
15651 NE Browndale Farm Rd
Aurora, Oregon, 97002

Rebecca Safronchik
15651 NE Browndale Farm Rd
Aurora, Oregon, 97002

Alexander Safronchik
15651 NE Browndale Farm Rd
Aurora, Oregon 97002

In a message dated 3/5/2011 5:04:08 P.M. Pacific Standard Time,
berniceativeyacres@hotmail.com writes:

Aurora Airport Master Planning Process

Petition to the Oregon Department of Aviation from Aurora Airport Neighbors in the Prairie View Community

Whereas, the Aurora State Airport lies less 1 1/2 miles south of the Prairie View residential community and over-flights of Prairie View are already frequent and noisy and

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=

Bernice,

First a thank you for all the time and effort you put in for all of our sakes. We both appreciate it.

We agree with the attached proposal, namely the Petition to the Oregon Department of Aviation from the Aurora Airport Neighbors in the Prairie View Community.

Robert C. Brooks 14510 NE Mulligan Court, Aurora, OR 97002
Susan G. Brooks 14510 NE Mulligan Court, Aurora, OR 97002

Thank you.

Aurora Airport Master Planning Process
Petition to the Oregon Department of Aviation
from
Aurora Airport Neighbors in the Prairie View Community

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Aurora Airport Master Planning Process
Petition to the Oregon Department of Aviation
from the
Residents of the Charbonneau Community in Wilsonville

Whereas, the Aurora State Airport lies less than 2 miles south of the Charbonneau residential community and over-flights of Charbonneau are already frequent and noisy and,

Whereas, the Oregon Department of Aviation is considering the possible inclusion of an extension of the existing runway and/or strengthening the runway to accommodate heavier aircraft in the current master planning process,

We, the undersigned residents of Charbonneau, express our grave concern about the number of larger jets that such an extension would bring, with the resultant increase in noise pollution for neighboring communities. We oppose such action for the following reasons:

1. At this airport, landings to the south require jets and others to fly low over dense residential areas of Wilsonville and surrounding communities. The proposed control tower, operating only during daylight hours, will not be able to fully mitigate this problem.

2. The environmental impact of a runway extension or strengthening, bringing additional and larger jet traffic, will likely have a negative effect on property values for many Wilsonville residents including those living in Charbonneau.

3. The extension proposed is sought by a very small number of operators, most of whom regularly use its current runway. At a time of extreme State and Federal budget difficulties it is unacceptable to consider spending large sums of taxpayer money on development to benefit so few special interests.

4. This Airport is constrained on all sides by roads and residences, by one runway, and by private infrastructure close to the taxiway and runway, all hampering long term expansion. For example, it is not practically possible, nor financially feasible, to reduce the approach minimums to less than ¾ mile, something that would make the Airport a more reliable destination in bad weather. If a longer runway is required in the region this should be done at a rural area airport with many fewer constraints, such as Mulino.

For all the above reasons we request that consideration of a runway extension and/or strengthening the weight-bearing load of the runway at Aurora Airport be postponed to allow study of the most appropriate location and timing for such developments and any extension or strengthening be excluded from the current Master Plan update.

March 2011

We, the undersigned people, support the:

Petition to the Oregon Department of Aviation
from the
Residents of the Charbonneau Community in Wilsonville
Regarding the Aurora Airport Master Planning Process

PRINT NAME	SIGNATURE
JERRY TILLERY	Jerry Tillery
Mary Tillery	Mary A Tillery
MARY BORUD	Mary Borud
CANDACE PLANT	Candace Plant
BILL & JENIFER BRONTSEMA	BrontBema
JENIFER BRONTSEMA	Jenifer Brontsema
ELEANOR MURRAY	Eleanor Murray
IAN MURRAY	Ian Murray
JEANNETTE NIELSEN	Jeannette M. Nielsen
THEO W. NIELSEN	
FREDERICK PRESTON	
Barnadeen Handewith	BURNADEEN HANDEWITH
Gloria Shaw-Walker	Gloria Shaw-Walker
Patricia Tewell	Patricia Tewell

March 2011

We, the undersigned people, support the:

Petition to the Oregon Department of Aviation
from the
Residents of the Charbonneau Community in Wilsonville
Regarding the Aurora Airport Master Planning Process

PRINT NAME	SIGNATURE
Rosemary R. Mason	
Dan Mason	
Robert Graham	
Patricia Graham	
Elizabeth Barrett	
Dana Richmond	
Mike Richmond	
Tom Barrett	
Larry Hanlon	
Kathleen Hanlon	
Dennis Barton	
Eugene Freeman	
John Plant	

March 2011

We, the undersigned people, support the:

Petition to the Oregon Department of Aviation
from the
Residents of the Charbonneau Community in Wilsonville
Regarding the Aurora Airport Master Planning Process

PRINT NAME	SIGNATURE
Susan T. Roisom	Susan T Roisom
Sara L Bennett	Sara L Bennett
Joan Pene	Joan Pene
Robert Pene	Rupene
DAN ROISOM	Dan Roisom
CARMELLA A. WEBB	Carmella A Webb
Barbara J Myers	Barbara J Myers
DAVID Sanville	David Sanville
Cherie Sanville	Cherie L Sanville
SHEILA M BARTON	Sheila M Barton
HAROLD W PARKER	Harold W Parker
~~Joey Hadfield~~	
JOEY HADFIELD	Joey Hadfield
Michael W. Tewell	MICHAEL W. TEWELL

March 2011

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PRINT NAME	SIGNATURE
CAROL E ZINSLI	Carol E. Zinsli
Lynn Gearhart	Lynn Gearhart
Lenly M Gearhart	Lenlym Gearhart
Charlock Patterson	C. K. Patterson
Judith M. Patterson	Judith M. Patterson
James H. Gibbons	James H. Gibbons
John Paquet	John B Paquet
Sue Eggleston RUTH HAGLAND	Sue Eggleston Ruth Hagland
~~Sally Oniski~~	John Oniski
SALLY ONISKO	John Oniski
Maridel Wise	Maridel Wise
Pat Holm	Pat Holm
Robert Holm	Robert Holm

We, the undersigned people, support the:

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PRINT NAME	SIGNATURE
Bob Olson	Bob Olson
Lindy Anderson	Lindy Anderson
Stephen Perry	Stephen Perry
Bernice A Perry	Bernice A Perry
Sandra G. Shapiro	Sandra G Shapiro
Dennis Krieske	Dennis Krieske
Robert C Johnson	Robert C Johnson
Jacquelyn A. Johnson	Jacquelyn A Johnson
Karol I. Wall	Karol I Wall
Jon L. Woerner	Jon L Woerner
Michael R. Muller	Michael R Muller
Janet L. Woerner	Janet L Woerner
Charlotte Allert	Charlotte Brower
Vehrice Brower	Jess Peno
Jess Peno	J

March 2011

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PRINT NAME	SIGNATURE
JAMES R. GREENE	James R. Greene
Stanley J. Wall	Stanley J. Wall
Thomas S. COUNCELL	Thomas S. Councell
MARILYN J COUNCELL	Marilyn J Councell
FAYE N. STEELE	Dorothy Steele
C. Stanley Hays	C. S. Hays
Sara Frank	Sara Frank
ANGELA C GREENE	Angela C Greene
Shirley Scrivens	Shirley Scrivens
Ronald Lehl	Ronald D Lehl
Jack Scrivens	Jack B. Scrivens
Kathleen S Fuller	Kathleen S Fuller
Benjamin Lawson	Benjamin Lawson
KATHIE BARTON	Kathie Barton

March 2011

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Regarding the Aurora Airport Master Planning Process

PRINT NAME	SIGNATURE
Shirley K Rieske	Shirley Krieske
Michelle Giroux	Michelle Giroux
NAdine HANSON	Nadine Hanson
MAXINE A HANSON	Maxine a Hanson
JEANNIE L BRANDSTROM	Jeannie L Brandstrom
CHUCK BRANDSTROM	C Brandstrom
ANTHONY HOLT	Anthony Holt
Susanna Holt	Susanna Holt
Ron Sletta	Ron Sletta
CAROLE Sletta	Carole Sletta
BUBBA HEARD	Bubba Heard
Ed Croft	Ed Croft
Teresa Bean	Teresa Bean
Elizabeth E. Heard	Elizabeth E Heard

We, the undersigned people, support the:

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Residents of the Charbonneau Community in Wilsonville
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PRINT NAME	SIGNATURE
DONALD F KLOSTERMAN	Donald F Klosterman
Veralyn J. Klosterman	Veralyn J Klosterman
Kim Lawson	Kim Lawson
WILLIAM E. LAWSON	William E Lawson
CLARK RHUDY	Clark Rhudy
Robert Cortright	
Katherine Robe	Katherine Robe
Glenn Liffick	Glenn Liffick
LYNN LIFFICK	Lynn Liffick
Sharon Thomas	Sharon Thomas
Sally Bond	Sally Bond
CAROL S. MOORE	Carol S. Moore
BARBARA	Barbara Sutton (I object to flights over homes)
ANITA McFARLAND	Anita McFarland

March 2011

We, the undersigned people, support the:

Petition to the Oregon Department of Aviation
from the
Residents of the Charbonneau Community in Wilsonville
Regarding the Aurora Airport Master Planning Process

PRINT NAME	SIGNATURE
Barbara B. Sebastian	Barbara B. Sebastian
B. E. SEBASTIAN	Ed Sebastian
Bill Freck	Bill Freck
Judy Freck	Judith M Freck
Pat Struckman	Pat Struckman
Debra Schramm	Debra Schramm
Debbie Stonebraker	Debra Stonebraker
Janet Moore	Janet Moore
ANN KEDDIE	Ann Keddie
Frieda Jackson	Frieda Jackson
Maryanna Wiese	Maryanna Wiese
KATHY MILLER	Kathy Miller
JULIE CLARK	Julie Clark
Reginald L. Keddie	Reginald L. Keddie

March 2011

We, the undersigned people, support the:

Petition to the Oregon Department of Aviation
from the
Residents of the Charbonneau Community in Wilsonville
Regarding the Aurora Airport Master Planning Process

PRINT NAME	SIGNATURE
JACK E. KAHLE	
Farol L. Kahle	
Keith Olson	
Nancy Olson	
Dorothy Wallwis	
Robin D Santos	
JOHN M SANTOS	
[illegible]	
Susan Steele	SUSAN STEELE
Lila McCarthy Langford	LILA McCARTHY-LANGFORD
LATIMER FRAZIER	
Eddy Van Guelpen	EDDY VAN GUELPEN
Susan J. Preston	
BARBARA A. ANDERSON	

March 2011

We, the undersigned people, support the:

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from the
Residents of the Charbonneau Community in Wilsonville
Regarding the Aurora Airport Master Planning Process

PRINT NAME	SIGNATURE
Jeanie Paqué	Jeanie Paqué
Susan DeFrancisco	Susan DeFrancisco
Elaine Brunmeier	Elaine Brunmeier
JANE DEPROSPERO	Jane DeProspero
Irja Telfer	Irja Telfer
MARGARET HARRINGTON	Margaret Harrington
Leonard A DeFrancisco	Leonard A DeFrancisco
KARI MULDROW	Kari Muldrow
VIRGINIA L. HORLER	Virginia L Horler
LINDA WATKINS	Linda Watkins
Arlo K. Amundson	Arlo K. Amundson
ROY HENEGAN	R
Jerome B. Zeller	Jerome B Zeller
JOSEPH SWYT	Joseph Swyt

We, the undersigned people, support the:

Petition to the Oregon Department of Aviation
from the
Residents of the Charbonneau Community in Wilsonville
Regarding the Aurora Airport Master Planning Process

PRINT NAME	SIGNATURE
Joyce Swan	Joyce Swan
[illegible]	[illegible]
Edwin H Reid	Edwin H Reid
GEORGE ANDERSON	George Anderson
ARTHUR JOHNSON	Arthur Johnson
ROGER GARRETSON	[illegible]
M RUHLED Ed	[illegible]
B. Ruhleder	B. Ruhleder
SALLY KINGSTON	Sally A. Kingston
JACQUELINE PETERS	Jacqueline Peters
RICHARD PETERS	[illegible]
Robert Henry	[illegible]
M June Henry	M. June Henry
Jacqueline Powell	Jacqueline Powell

March 2011

We, the undersigned people, support the:

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from the
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PRINT NAME	SIGNATURE
LINDA LANDRE	Linda Landre
Martha Griggs	Martha Griggs
Millie Kuylock	Millie Kuylock
Kathy Gibbons	Kathy Gibbons
Jane C. King	Jane C King
Jeanie Paque	Jeanie Paque
Sandra Wicht	Sandra Wicht
Peter M Watkins	Peter M Watkins
ANDY MILLER	Andy Miller
Verna L. Westbury	Verna L. Westbury
R. Bruce Westbury	R. Bruce Westbury
DONALD LOFF	Donald S Loff
Jean Loff	Jean Loff
SALLY FELL	Sally Fell

March 2011

We, the undersigned people, support the:

Petition to the Oregon Department of Aviation
from the
Residents of the Charbonneau Community in Wilsonville
Regarding the Aurora Airport Master Planning Process

PRINT NAME	SIGNATURE
JOHN WALKER III	
DON HANDEWITH	
NANCY McELWAIN	
ALAN KIRK	
Don Higgins	
Shirley Higgins	
JANET D. OLMSTED	
LARRY EISCHEN	
Mildred L. Dupray	
Judith S Eischen	
CAROL K. HANSON	
Gloria M. Brayson	
Betty Mathison	

Susie -
503-694-5783

1 March 2011

We, the undersigned people, support the:

Petition to the Oregon Department of Aviation
from the
Residents of the Charbonneau Community in Wilsonville
Regarding the Aurora Airport Master Planning Process

PRINT NAME	SIGNATURE
KRIS FULTON	
PENNY KIRK	
Connie K Taylor	
LEE ZINSLI	
Larry Hall	
Janie Olson	
A. Bruce Olson	
RONALD L. LEEPER	
ELAINE JUNTA	
FRANK	
Suzanne W Sanford	
Don Larson	
Leroy Ostrem	
Peter VERRANA	

(2) March 2011

We, the undersigned people, support the:

Petition to the Oregon Department of Aviation
from the
Residents of the Charbonneau Community in Wilsonville
Regarding the Aurora Airport Master Planning Process

PRINT NAME	SIGNATURE
JIM & JUDY CONOVER	
JAMES W. OBERG	
Linda Schultze	
Kathleen Paxson	
Rod Leeper	
Dennis Jaskowski	
James J. Muldrow	
James A. Sanford	
DAVE MASSING	
~~Mike Greenwood~~ Robert Bolden	
SONJA CATANIA	
LILA LANGFORD	
RICK SAWYER	

March 2011

We, the undersigned people, support the: (3)

Petition to the Oregon Department of Aviation
from the
Residents of the Charbonneau Community in Wilsonville
Regarding the Aurora Airport Master Planning Process

PRINT NAME	SIGNATURE
Roland L. Taylor	
ROGER M CHRIST	
Robert W. Cole	Robert W. Cole
LAWRENCE E. HANSON	
CLAIR A. SIMMONS	
ROBERT HARROW	
ELIZABETH MASSING	
Judy Miller	
Bob Junta	
Susan Taylor	
Thomas Taylor	
RICHARD MILLER	
William Parson	WILLIAM PARSON
Sherry Jablonski	

March 2011

We, the undersigned people, support the:

Petition to the Oregon Department of Aviation
from the
Residents of the Charbonneau Community in Wilsonville
Regarding the Aurora Airport Master Planning Process

	PRINT NAME	SIGNATURE
	RUTH M. JOHNSON	Ruth M Johnson
	Catherine E. Faby	Catherine E Faby
	Tony Davey	Tony Davey
	MARY V. DAVEY	Mary V Davey
X	PETER HOFF	
	JON WOERNER	Jon Woerner
	David Jones	David Jones
	Celeste Suzanne Jones	Celeste Suzanne Jones
	Larry Baugh	

Friends of
French Prairie

Friends of French Prairie
is an Oregon non-profit corporation

PO Box 403 | Donald, Oregon 97020 | www.friendsoffrenchprairie.org

March 10, 2011

Chris Cummings
Oregon Department of Aviation
3040 25th Street
Salem, OR 97302

Mr. Cummings;

As you know, Friends of French Prairie is a land use organization who's area of interest is French Prairie, the historic and agricultural center of Oregon. The Aurora Airport happens to sit in north east French Prairie, and is surrounded principally by farmland zoned EFU that are comprised of Class I and II soils. Our greatest concern is the preservation of farmland.

We are opposed to expansion of the Aurora Airport, because all such expansion occurs at the expense of farm land. The airport was expanded in the '90s (resulting in the reconfiguration of Kiel Road), which in turn allowed the airport to handle larger aircraft. This attracted not just aircraft owners with larger aircraft, but aviation industry, which in turn led to more traffic, etc. The result of which is the current "safety problem" that has to be resolved with an air traffic control tower. Marion County has abetted this process by approving zone changes that have increased aviation activity, in as much as they see the airport as a tax revenue source and appear not to be concerned that the consequence is loss of farm land. The most recent and egregious example is the rezoning of EFU land allowing Helicopter Transport Corp. to relocate to the southwest corner of the airport will greatly increase helicopter traffic, and removes 30 acres of farm land.

While we support improved air traffic safety, and thus the air traffic control tower, we support the No-Build Alternative found in Chapter 5 of the current Aurora Airport Master Plan document. The airport should continue as is, with necessary and required maintenance. All the other proposed alternatives either increase the runway length or accomodate precision approach which means more larger aircraft which means airport expansion. We note that Alternatives 1 proposes moderate runway lengthening within the current airport boundary, but Alternatives 3 and 4 are expansion of such scope as to be substantially expand the Runway Object Free Area and the 35' Building Restriction Line, and as such are intolerable.

The efforts of Oregon Department of Aviation, Marion County, and the local aviation industry over the past two decades have not only expanded the airport, but have created a domino effect of actions leading to contemplated and uncontemplated results which require another action--all characterized by expansion and loss of farm land.

The current master planning process will continue this outcome if the airport is expanded yet again. Agriculture is a major economic sector in the state and in Marion County. French Prairie has the best soils in the United States. Both need to be protected.

Please see attached petition signed by members of Friends of French Prairie, uniformly in opposition to expansion of the Aurora Airport.

Sincerely



Benjamin D Williams

President, Friends of French Prairie

PETITION CONCERNING THE MASTER PLANNING PROCESS FOR THE AURORA STATE AIRPORT

To be submitted to OREGON DEPARTMENT OF AVIATION

by FRIENDS OF FRENCH PRAIRIE

Whereas the Aurora State Airport is located in the French Prairie part of Marion County, the historic and agricultural heartland of Oregon, primarily comprised of agricultural land characterized by the finest soils in the United States.

Whereas Oregon Department of Aviation is currently conducting an update to the Aurora State Airport Master plan, we the undersigned hereby express our concern with the potential negative impacts of the Master planning process, and specifically oppose:

- The contemplated lengthening of the runway which has the potential to attract more aviation operations and **negatively impact nearby roads and traffic**;
- Expansion of the Aurora Airport beyond the current boundaries as a result of implementing "precision approach" and the consequent **loss of farm land.**

Signed by

Wm D. Wolfstein — William D. Wolfstein
Name — Signature

9533 Yergen Rd NE Aurora, OR 97002
Address

Dianne Rutl
Name — Signature

23747 1st St NE Aurora OR 97002
Address

Benjamin D Williams
Name — Signature

23013 Leary Ln NE Aurora OR 97002
Address

Jan House — Jan House
Name — Signature

23022 yeary Lane Aurora, OR 97002
Address

David Rebner — David R. Rebner
Name — Signature

Box 480 St. Paul, OR 97137
Address

Joe Casale Jr — Joe CASALE JR
Name — Signature

13000 NE Denbrook Rd AURORA OR 97002
Address

Joe Casale III — Joe Casale III
Name — Signature

P.O. Box 542 Donald OR. 97020
Address

Ryan Fowler — RL
Name — Signature

12877 Maplecrest Ct NE Aurora, OR 97002
Address

Twila Wettstein — Twila M Wettstein
Name — Signature

9533 Jorgen Rd Aurora OR 97002
Address

Sheila Lemons — Sheila Lemons
Name — Signature

10207 Mathieu Ln, Aurora OR 97002
Address

Dick + Mary Lundy — Dick Lundy
Name — Signature

12300 SW Bore Rd, Sherwood OR 9708
Address

JACK + SUZANNE MARQUIN — Jack F Marquin
Name — Signature

23252 BENTS RD, AURORA OR 97002
Address

PAUL + JUDY KNAPP — Paul Knapp
Name — Signature

10499 Champoeg RD, Aurora OR 97002
Address

GREG + SALLIE HULBERT — Sallie Hulbert
Name — Signature

13652 ARNDT RD. AURORA OR 97002
Address

Bill + Valerie Madison — Valerie Madison
Name — Signature

22365 Bents Rd Aurora OR 97002
Address

PETITION CONCERING THE MASTER PLANNING PROCESS FOR THE AURORA STATE AIRPORT

To be submitted to OREGON DEPARTMENT OF AVIATION

by FRIENDS OF FRENCH PRAIRIE

Whereas the Aurora State Airport is located in the French Prairie part of Marion County, the historic and agricultural heartland of Oregon, primarily comprised of agricultural land characterized by the finest soils in the United States.

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- Expansion of the Aurora Airport beyond the current boundaries as a result of implementing "precision approach" and the consequent **loss of farm land.**

Signed by

Eric Hoem — Eric Hoem
Name — Signature

8301 SW Lafayette Way
Address

Wilsonville, OR, 97070

Stephen G Baker — Stephen G Baker
Name — Signature

13700 SW Bell Rd, Sherwood, OR 97140
Address

Mary Herschberger — Mary Herschberger
Name — Signature

8425 SW Curry St. Wilsonville, OR 97070
Address

R. Michael Iverson
Name Signature

13490 Cedarwood Rd. N.E. Aurora, Or 97002
Address

Paula Williar
Name Signature

23013 Yeary Lane Aurora Oregon 97002
Address

Reginald L-Keddie
Name Signature

31988 SW Country View Lane Wilsonville, OR 97070
Address

ANN V. KEDDIE
Name Signature

31988 SW Country View Ln Wilsonville, OR 97070
Address

Charles N. Irvine
Name Signature

20940 Hubbard Cutoff Rd. Aurora, OR. 97002.
Address

Mark Kraemer
Name Signature

23707 1st St. N.E., Aurora, OR 97002
Address

Julia Kraemer — Julia Kraemer
Name — Signature

23707 1st St. N.E., Aurora, OR 97002
Address

Ken Ivey
Name — Signature

24700 NE Prairie View Dr., Aurora OR 97002
Address

Carla Mikkelson — Carla J. Mikkelson
Name — Signature

17244 Arbor Grove Rd NE Woodburn, OR 97071
Address

Marcee Garrett — Marcee Garrett
Name — Signature

PO Box 480, 3961 Brackett Hele St. Paul 97137
Address

CINDI ELLIOTT — Cindi Elliott
Name — Signature

23023 YEARY LANE NE AURORA OR 97002
Address

DOROTHY BAKER — Dorothy Baker
Name — Signature

13700 SW Bell Rd, Sherwood, OR 97140
Address

Allen E. Daly — Allen E. Daly
Name — Signature

11001 Daly Ln — ajlogs@aol.com
Address

Aurora. OR. 97002

James Moore, Robert J.A. Moore — Robert J.A. Moore
Name — Signature

23061 schultz rd NE, Aurora, OR 97002
Address

Dennis Maxs — [signature]
Name — Signature

~~Lot~~ ~~12102~~ 12120 Fargo Rd. N.E. Aurora
Address

Peter Koehler, Jr — [signature]
Name — Signature

21117 Case Rd NE, Aurora OR 97002
Address

Noël Hanlon — [signature]
Name — Signature

21117 Case Rd. NE Aurora OR 97002
Address

Lynn & Alice Baustian — [signature]
Name — Signature

23003 Yeary Ln NE Aurora Or 97002
Address

MARY ELIZABETH WELLS — Mary Elizabeth Wells
Name — Signature

5605 BUYSERIE RD, ST PAUL OR 97137
Address

Don + Joanne Keeley — Don Keeley
Name — Signature

5975 Buyserie Rd St PAUL OR 97137
Address

JOAN + MARCIE HOVE — Joan Hove
Name — Signature

11331 FARGO RD NE, AURORA OR 97002
Address

John + Katherine Miller — John T Miller
Name — Signature

22615 Boones Rd NE, AURORA OR 97002
Address

Name — Signature

Address

Name — Signature

Address

Aurora State Airport Master Plan

Planning Advisory Committee (PAC) Meeting #5

June 7, 2011
Maplewood Grange Hall, Aurora, OR

MEETING SUMMARY

Attendees

Oregon Department of Aviation (ODA) –Sandra Larsen, John Wilson and Mitch Swecker (also a PAC member)

WHPacific – Rainse Anderson and Sarah Lucas

JLA Public Involvement –Adrienne DeDona and Sylvia Ciborowski

Public Advisory Committee (PAC) – Patti Milne, Bruce Bennett, Jim Bernard, James Meirow, Tony Holt, Steve Hurst, Nick Kaiser, Rick Kosta, Ted Millar, Fred Netter, Dan Riches, Ray Phelps, Craig Wilmes, Randy Carson, Tony Helbling, Roger Kaye and Dave Waggoner. (PAC Member not in attendance: Jim Hansen)

Public Attendees – see attached sign in sheets

Welcome and Introductions

Rainse Anderson kicked off the meeting and thanked everyone for coming. He explained that this was the fifth PAC meeting. The meeting had been moved up to address the preferred alternative and the various add-on scenarios developed in March. Rainse introduced himself, Sarah Lucas from WHPacific and Mark Gardiner from the Oregon Aviation Board. Mark Gardiner introduced himself as the Chair of the Oregon Aviation Board and added that Joe Smith and Jack Loacker from the Oregon Aviation Board were also in attendance. Mark explained that this project has been through quite a process and a lot has gone on. He said that initially a preferred alternative and a couple of scenarios were developed and reviewed by the Aviation Board. The Board is interested in hearing what people think of each of the scenarios. Mark said that one scenario included an 800 foot displaced threshold to the north. He felt that this scenario balanced as many varying factors as possible. He added that many people feel this scenario is a viable alternative for the airport, while still meeting the community needs. However, he said that he is not confident that they will get cooperation from FAA related to this scenario. Because of this, they are still looking at an extension to the south. Mark said that they are still in process of balancing the needs of the airport and needs of the community.

Rainse asked for show of hands from the audience whether or not this was the first meeting they had attended. There were several people who raised their hands; approximately one quarter of the group.

Rainse reviewed the meeting agenda and explained there would be public comment at the end of the meeting. Each person would likely have about 2 minutes to speak. He said the meeting should be wrapped-up and adjourned around 7 p.m.

Presentation: Draft Preferred Alternative

Rainse explained that the master plan is a 20 year guide for airport development in order to obtain funding from the FAA. He said that so far in this process, they have completed Chapters 1 through 5 [Chapter 1: Introduction *(master plan issues and goals and airport role),* Chapter 2: Airport Inventory *(current airport facilities, zoning and aviation activity),* Chapter 3: Aeronautical Activity Forecast *(forecast for 20-year planning period),* Chapter 4: Facilities Requirements *(airport needs to meet future forecasted demand),* and Chapter 5: Airport Alternatives *(how to address the needs identified in Chapter 4)].* They are currently moving towards developing Chapters 6 and 7: the Airport Layout Plan (ALP) and Capital Improvement Plan (CIP). The ALP must be approved by the FAA, to enable funding from the FAA.

Rainse said that this meeting was moved up from the last meeting, which would have covered the Master Plan' final draft, so that the preferred alternative and the various add-on scenarios could be reviewed with the PAC and the public. The last meeting has been eliminated in order to provide for this meeting.

Rainse explained that the draft alternatives were presented to the PAC on March 10th. Following that meeting, public comments were collected until March 24th. A presentation was given to the Oregon Aviation Board on March 31st and again on April 28th. Due to the comments that were received related to the draft alternatives and the need for extended runway, a discussion took place regarding adding a displaced threshold.

Rainse reminded everyone that this meeting was intended as a work session for the PAC and requested that members of the public hold their comments until the public workshop session or during public comment.

Sarah Lucas reviewed the process since the last PAC meeting. She said that they had received 30 comment forms at the last meeting and 60 were sent in following the meeting. Over 100 people took the online survey. The results were fairly split between the no-build and alternative 2. Common themes throughout all of the comments were related to the airport reference code, runway length, runway strength.

PAC Discussion: Draft preferred Alternative

Tony Holt asked if the slide regarding public comments was presented to the Aviation Board. He said that he was not sure how many of the comments were recorded since he had submitted a petition with 260 signatures that were not included and supported no runway extension. He added that this seems to be cherry picking the comment data. Sarah responded that the comments were not 1 for 1 weighted and there were other communities that submitted petitions. Sarah clarified that this is a summary of the input received from the comment forms.

Tony asked how they came to the conclusion of developing the preferred alternative and the displaced threshold scenarios. Rainse responded that the comment forms are all available online. There were many comments received from airport users that requested a runway extension and that they are trying to balance the input received. Rainse stated that this has been an open process; trying to juggle all of the needs. Mitch explained that ODA values all of the input received and they consider all input equally; they don't put more weight on some input than others. He added that they've met with the FAA numerous times and the FAA believes they have justified constrained operations for a runway extension. Tony reiterated that his issue is with the decision that was made related to the preferred alternative. Rainse explained that based on the input collected, along with the input from the Board, they determined the preferred alternative.

Bruce Bennett said he would like to point out that there were various alternatives considered that made up the outcome of the preferred alternative.

Sarah reviewed the draft alternative that was presented to the Oregon Aviation Board:

- No runway extension
- Increased pavement strength (load capacity), which would match the parallel taxiway's pavement strength. This would allow for heavier aircraft to takeoff and land on the runway.
- To the south shows increased RPZ for a larger safety area with an approach greater than three quarter statute miles. Some impacts to residential and farm properties due to acquisition needed.

Sarah explained that at their last meeting, the Aviation Board requested further public comment on the preferred alternative and add-on scenarios. Since that time, they have received 42 e-mails. Most comments received were in support of the preferred alternative: increased runway length and increased runway strength. A few people made comments in support of or against improved instrument approach capability. A couple of people were against the upgraded airport reference code and the cargo apron. One person made a comment in support of the Rural Fire Protection District Facility. Sarah stated that all of the comments are listed online in Appendix K.

A PAC member commented on the strength and length of the runway. Sarah explained that comment summary is related to the comments received. Another PAC member asked if there was someone on the team that is an expert in statistical analysis. Sarah explained that this isn't a statistically valid survey.

Sarah said that the add-on scenarios were developed based upon the comments received following the last PAC meeting. She reviewed the concept of displaced thresholds, which are a very technical design for runway extensions/declared distances that typically only pilots understand. Sarah read the definition of displaced thresholds: *The purpose of declared distances in airport design is to provide an equivalent Runway Safety Area (RSA), Object Free Area (ROFA), or Runway Protection Zone (RPZ) in accordance with the design standards at existing constrained airports where it is otherwise impracticable to meet standards by other means. Declared distances are also employed when there are obstructions in the runway approaches and/or departure surface that are beyond the ability of the airport owner to remove.* Sarah said that what that means is that there are four proposed declared distances:

Add-on Scenario 1: Sarah explained that in this scenario, the threshold stays the same, but pavement would be extended 200 ft to the north and 600 ft to the south for a total of 800 feet.

	Runway 35	Runway 17
Takeoff Run Available (TORA)	5,604’	5,204’
Takeoff Distance Available (TODA)	5,604’	5,204’
Accelerate-Stop Distance Available (ASDA)	5,804’	5,804’
Landing Distance Available (LDA)	5,004’	5,004’

There was a question from a PAC member regarding relocating fuel tanks: If ODA can afford to move the fuel tank, why can’t we ask property owners to move their facilities to provide for a runway extension? Mitch explained that funding hasn’t been identified. Sarah explained that fuel tanks will be moved when they reach their life expectancy.

Add-on Scenario 2: Sarah explained that the distances will remain the same in this scenario, but with no additional added pavement to the north. Traffic departing to the south would have additional runway, but traffic departing to the north would not. Departing to the south is against the calm wind recommendations.

	Runway 35	Runway 17
Takeoff Run Available (TORA)	5,004’	5,804’
Takeoff Distance Available (TODA)	5,004’	5,804’
Accelerate-Stop Distance Available (ASDA)	5,804’	5,804’
Landing Distance Available (LDA)	5,004’	5,004’

Rainse explained that the scenarios were reviewed by the FAA and they were not thrilled with the idea of displaced threshold, and said that there is justification for a runway extension. ODA requested an official position from the FAA which was received today. Copies were provided to the PAC members. Rainse summarized the letter from the FAA. The FAA feels that displaced thresholds would only be used in a limited capacity and anything additional is a runway extension. To take the Runway Protection Zones (RPZ), object free areas and move them out impacts operators, particularly Columbia Helicopters on the north. The same thing would occur on the south side which would cross Keil Road. The benefit of the displaced threshold goes away with the FAA’s position. The FAA indicated they will not participate in funding partial or limited use of a runway extension.

A PAC member asked about the closure of Keil Road which is an important farming access road. He asked if the FAA plans to pay for relocation. Rainse replied that often times these types of road relocations are paid for by the FAA.

Add on Scenario 3: Sarah explained that this scenario includes a 1,000 ft extension to the south and takes pavement out to the current airport property RPZ another 1,000 ft. This option would require closure of Keil Road. Scenario 3 shows the declared distance of 6,004 ft.

	Runway 35	Runway 17
Takeoff Run Available (TORA)	6,004’	6,004’
Takeoff Distance Available (TODA)	6,004’	6,004’
Accelerate-Stop Distance Available (ASDA)	6,004’	6,004’
Landing Distance Available (LDA)	6,004’	6,004’

Rainse asked if there were further questions from the PAC.

Tony Holt stated that this was a planning process, not a funding process and his understanding was that the FAA does not have to approve the master plan. Rainse explained that they have to sign the ALP, but not the master plan. The State has to approve and update the capital improvement plan each year. Tony asked if we have to conform to the FAA through this process. Rainse replied there is a lot of demand driven items in this process such as hangars, tie-downs, etc. That is why the user survey was completed at the outset of this process in order to justify the process. The State doesn’t have money in the foreseeable future for this project. Mitch explained that this is a long-range plan based upon the needs of the aviation community. The FAA will not fund improvements without approval of the ALP. Tony said that part of his problem is how to get to the ultimate decision considering the feedback received. Mitch responded that the FAA thinks the extension is justified based up on the constrained operations.

Jim Bernard, Clackamas County Commissioner, said he understands that many PAC members feel that the needs analysis was cooked. He also supports economic development and job growth. There will be impacts on Clackamas County that they don’t know how to pay for. Will an extension increase the use at the airport? An analysis of the impact on public facilities needs to take place. Was there any analysis of closing Keil Road? Will Mulino be the next rural airport that needs to be expanded? There needs to be an analysis of farm land and farming practices. Has ODA analyzed the impact of the Salem Airport extension? Will ODA commit now to do the analysis later? Mitch responded that we have talked about a lot of these issues all along and a study would have to be done on the runway extension. It would not be fair for ODA to do all the traffic analysis study. Jim Bernard added that the Mayor of Canby has also said they do not have the money to accommodate the impacts of expansion. I-5 will be impacted. Communities to the north will be impacted. He added that he would greatly appreciate the analysis of these impacts. Mitch said ODA would consider cost sharing when the time comes and added that it is not reasonable for the airport to bear the cost when airport traffic is only a small percentage of the total traffic. Rainse said that prior to any runway extension there would have to be an environmental process that would have to take place, which would analyze traffic, endangered species, social impacts, etc. before construction was approved by the FAA.

Fred Netter commented that when this first came out the first concern was safety. Now looking at an extension, he's not sure if the safety impacts have been addressed. Rainse explained that on the last scenario there were three locations identified for the control tower. Fred said that the Fire District has talked about the Fire District facility, but he doesn't see a location for where that would be designated when funding is identified. He asked if a location will be guaranteed. Mitch said that they would like to have that space designated for a fire facility.

A PAC member commented that we were informed that a tower would be added to improve safety. He doesn't understand how lengthening the runway would improve safety whether there is a tower or not because there would be larger planes with more fuel. Rainse said the two aren't necessarily connected. Planes can come in and land, but are constrained when taking off. The additional runway will allow for better take off.

It was added that engine failure could occur at any time and additional runway allows more space and prevents emergency landing in fields or residential areas. Also, increased airport use takes cars off the road. The Keil Road closure could be relocated to Ehlen road.

Tony Holt stated that the issue of safety is obscured because there will be larger aircraft coming in. Larger aircraft will have the same safety problem as smaller airplanes. The logic is not there.

It was commented that the infrastructure doesn't meet the current demand of the airport. The PAC member added that he's not against growth, but he's concerned about how growth will be handled and how it affects the City of Aurora.

Another PAC member said this doesn't necessarily mean larger aircraft will come to Aurora unless it allows for it based upon the strength of runway.

A PAC member stated we are strengthening runway, so we would be allowing for larger planes. Rainse replied that if you look at the airport's current use, there are currently 60,000 pound aircraft. This change would be preserving the life of the pavement by strengthening it.

Bruce Bennett stated that most people wouldn't notice difference between 45,000 and 60,000 pound aircraft. The 60,000 pound aircraft are just larger business aircraft which tend to be quieter. These larger planes will allow for more jobs which will bring in revenue.

Public Workshop

Rainse reviewed the format for the public workshop and explained there would be 25 minutes for the public and the PAC to interact with staff to ask questions and review information about the preferred alternative.

After the 25 minute public workshop, Rainse reconvened the PAC session. Rainse explained that the PAC would now have the opportunity to discuss the preferred alternative and add-on scenarios and give input on the direction for the preferred alternative.

PAC Discussion

Mark Gardiner responded to some of the questions raised by the PAC earlier in the meeting. He said that related to the analysis of public facilities, traffic counts were done and airport traffic is a minor impact currently and is not a factor in any meaningful percentage between Canby and I-5. He added that at the last Aviation Board meeting, a person from Canby and a major employer in the area testified in favor of airport improvements. Airport users will not be forced to move anywhere, but may choose to move to Mulino due to the tower. Mark explained that intersections will be addressed through a planning process the airport will go through as part of the land use planning requirements. There has been consideration for prime farm land in the area and they have tried hard to limit any impacts to farmland. They are working hard to extend to the north vs. the south for that reason and will look at how to mitigate that. None of the recommendations will adversely impact farming. Keil Road is a minor facility and is not currently a source of traffic problems. The Salem Airport is outside of the Aurora airport market area, this would be the same thing as saying people would go to Portland although there are no hangars in Portland. Mark added that they will absolutely analyze the impacts, as required by the State's planning laws.

Steve Hurst, Wilsonville City Council, explained that during the breakout period he placed a copy of a letter on everyone's chair which states Wilsonville City Council's list of preferences related to the Master Plan:

- Improve management of aircraft approaching the airport that would result in the enhanced safety and reduced noise on Wilsonville.
- Eliminate the need to expand to the north.
- Preserve farmland
- Support concurrency by recognizing surface transportation improvements
- Recognize importance of preserving existing use of Keil Road for farm use

Patty Milne, Marion County Commissioner, stated that safety is most important to her. Farm and Agriculture in Marion County is extremely important to her and the Marion County Commissioners. Over the years, Marion County has made many specific statements about preserving farmland. Economic Development is extremely important to Marion County and the surrounding communities and they want to protect that. Everyone is well aware of the positive impact the businesses at the airport have on the City of Wilsonville, Clackamas County, and Marion County. Roads and transportation will need to be a joint effort with Clackamas County. When a master plan is determined, that will be the time to look at the conditions of the surrounding roads and identify the responsible parties. At that time, we will know how to identify the most important projects and prioritize them on the Marion County capital improvement plan and working with Wilsonville and Clackamas County. We will also look to federal and state government to help fund those projects.

Nick Kaiser said that since this project came out originally with preferred alternative, he has felt that it was a compromise and thought that it was a valid approach. He doesn't support a runway extension. He said they have the ability to deal with some of the safety issues without extending the runway and preserving the viability of the airport. Nick added that he had some other issues that he will address at a later time.

Randy Carson, Mayor of Canby, stated that he wears two hats. He works for Columbia Helicopters as well. He has watched the traffic increase over the years. He believes we need more transportation dollars on this side of the county. We should work to improve infrastructure to tie into I-5 and the airport. He believes there needs to be some build-out within the airport. Randy added that the big need is infrastructure and how we can work together to make that happen.

Roger Kaye said Keil Road is an important farm road and cannot be looked at primarily based on traffic counts. It's an important connector road as well. He previously wrote a letter to Mitch and ODA. He opposes lengthening the runway and disagrees that there is no noise difference between 45,000 and 60,000 pound planes.

Fred Netter of the Aurora Fire Protection District said he is happy to say that they have sited a facility at the truck stop which will improve response times to the airport. Keil Road is important for emergency access; without access though a gate or otherwise, emergency vehicles will have to go all the way around the airport. A gate could serve their purpose, but wouldn't help farmers. He wondered if Keil Road could be put below where there wouldn't be issues, or relocated further towards Ehlen Road. Fred said that he is adamantly opposed to any alternative that would remove access to Keil Road. If more traffic was added to Boones Ferry Road it would make it even more unsafe. There are currently numerous traffic incidents on Keil Road at Highway 551 which would be moved to Boones Ferry. He would like to make sure that the fire station has a dedicated spot on the airport property that cannot be taken away.

Tony Holt, representative of Charbonneau Country Club and residents, stated that he somewhat reluctantly supported the first preferred alternative because he felt it was a fair compromise and because that was put forward as a preferred alternative, he did not write numerous letters following the meeting. Tony stated that the summary of the comment forms does not stand up. He would like to know how ODA arrived at the decision for the preferred alternative.

Ted Millar, representative of airport users, said that they have held many public meetings for airport users at which they have come to understand the needs of the airport and the safety issues. A lot of pilots live in Charbonneau also. He believes there are two issues: safety first and jobs second. It has been well documented that there is a need for a runway extension. There have been noise studies that have been completed that prove that 60,000 pound airplanes are much quieter than the planes that currently land at Aurora Airport. Also with the longer runway, they are allowed to use noise abatement procedures. He has worked with the surrounding communities to establish instrument departures. On economic development, the job growth won't be at the airport. Big job growth will be within the surrounding communities that use aircraft at Aurora. He prefers scenario #2 because it fits within the needs of the surrounding community and it meets the needs of the airport users; a longer runway.

Bruce Bennett said he would like to point out that the Aurora airport has been there for 70 years. He has been involved with his family business that has been there over 40 years. He's also been involved in airport departure facilities that will abate noise and improve safety. The only way to do quieter takeoff is with more runway length. He believes we have worked hard to compromise with neighbors and

farmers and for that reason, he prefers scenario 2. Bruce added that additional runway is needed to takeoff safely for commercial aircraft. If FAA won't support scenario 2, then he would support scenario 3.

David Waggoner, business operator at the airport and resident of Clackamas County, said he appreciates the amount of revenue that Clackamas County generates for the airport, but he is frustrated that Clackamas County doesn't appreciate the amount of money that is generated at Aurora and gets funneled to Clackamas County. This is hugely beneficial to Clackamas County. He added that if managed correctly, there won't be an impact on Clackamas County. He supports scenario 2, but if the FAA doesn't, he would go back and support build alternative 1.

Tony Helbling, Wilson Construction, said he operates three fixed wing airplanes at Aurora. His company has various business locations in the United States and being able to get in and out of Aurora airport is critical to their business. When locating there, they looked at what is the best place, safest for employees, and allows growth that provides jobs for the people that live in the community. He added that money that comes in from out of state is brought to this community. He supports scenario #2 or a runway extension. He said that someone asked him if there are standard procedures for approach and he replied that pilots follow a highway in the sky. There are procedures that pilots are required to follow by the FAA. Not everyone follows these procedures, but this is comparable to automobile drivers who do not obey the speed limit. Most follow the regulations, but a few don't.

Jim Bernard said that Clackamas County does not oppose economic development or jobs. He just wants to be sure that the issue of traffic impacts is addressed. He said people can't deny that passenger planes and job growth won't increase cars on the road and he wants that addressed. Clackamas County does support economic development and growth. He feels their concerns were simply not addressed. They are concerned about the traffic impacts should the airport someday expand and want to see a study completed.

Mitch Swecker thanked everyone for providing their input from various viewpoints and said they are really trying to accommodate everyone and their feedback.

Rick Kosta, representative of Deer Creek Estates, said they are the closest community to the airport. If the runway is expanded to the south, they will be within 500 feet of the airport. The noise is currently an extreme factor. He does not support a runway extension, but does support runway strengthening. At previous meetings he has commented on the noise issues and has been told Deer Creek would be beyond the noise boundary. Rainse added that would be part of the social impacts study necessary for construction.

Craig Wilmes, area business representative, said he supports scenario #2 for increased safety and opportunities for business expansion.

Dan Riches, Columbia Helicopters, said he agrees with Craig. He explained that Columbia is a global company. They located at Aurora to be able to respond to their business needs. Columbia has spent a large amount of time ensuring they are a good neighbor. He believes the economic impacts on both

sides of the County line are significant. He supports expansion of the runway for safety reasons and prefers scenario #1. He added that he tempers his input with continuing to defend the use of their property.

Jim Meirow, City of Aurora, said he struggles with how we got from original alternative to where we are today, but has said in the past the City would support an extension within the airport property. Therefore, he supports scenario #2. He added that some adjustments could be made so that everybody can work with it.

Ray Phelps, Wilsonville Chamber, asked if there would be a later opportunity to comment. He explained the Chamber is not as nimble as this process is requiring. Their Board hasn't had a chance to take an official position and they want to do it correctly. He added that most people who work at the airport live in Clackamas County. Those are important people to us (600 of the 900 people). Rainse said that would be going to the Aviation board on the 23rd of June and requested that have comments in by then. Tom also said that many of the large businesses use the airport for airport traffic (Costco, State Farm, etc.).

Mitch Swecker again thanked everyone for input and said they had a tough act to complete.

Public Comments

Members of the public were each given two minutes to provide oral testimony regarding the draft alternatives.

Keith Amundson (Retired urban planner with state federal and local experience and a Charbonneau resident): The data and analysis only supports the no build alternative. Reluctantly, I would go along with idea of the preferred alternative, and reiterate the comments made by Tony Holt and the Clackamas County Commissioner.

Jeff Purr (Charbonneau resident): Against expansion of the runway. I have not heard a survey of residents of the area. There are 50,000 residents. How many of those people actually use the airport? Why are we expanding an airport for a small number of people? I hear jets in the middle of the night. There are other airport options, such as Hillsboro, Portland, and Salem. People can drive to those airports. There is no need to have residents hearing jets so close by. The airport is functioning as is, and there is no need to expand it. If companies want to grow, they can use other airports. I would rather use funds to build a second bridge across the Willamette than to use funds for this airport expansion.

Mike Iverson (French Prairie Board of Directors): French Prairie is opposed to expansion of airport, the closing of Keil Road and taking away farmland. The FAA and the Board seem to go against their statements in the preferred alternative, including stating that any expansion would not prove feasible. What has suddenly made expansion feasible? We should not use tax payer dollars to benefit a small number of people. I also farm land south of the runway and have holdings on the east and west side of the airport. I have 30 employees working for me and we cross Keil Road many times daily, so you can't say that it is not used. We have lots of farm equipment we need to move, and using Arndt Road would

be a disaster. Ehlen Rd would also be impossible. I am also an ex pilot. Surface transportation interruptions caused by the 1,000 ft expansion would be inconceivable to be compatible with farming.

Rob Callan (Charboneau resident): We are not using the best method of getting public comment. You need to talk to the people. There are a lot of pilots that don't follow the rules. 5:30 this Sunday morning there was a jet over Charbonneau—and that is the norm, not the exception. Whatever you do is going to increase the traffic at this airport. We don't understand why we need expansion when 25 miles down the road we have a very long runway. Aurora airport is a convenience to big companies. To have that convenience be to the detriment of homeowners and farms is unconscionable. Salem airport is a fine alternative. Tax payer money will be spent on Aurora, which functions now. Would like to count on Marion and Clackamas County to implement noise abatement ordinances if the expansion goes through.

Janet Olmstead (Wilsonville resident): My biggest concern is the traffic—the road traffic will be impacted terribly if we expand the airport. This whole thing seems to be a plan to enrich a few people and leave the rest of us in noise and traffic.

Glen Liffick: This seems to be airport creep. I have been involved with the evolution of a couple of local airports to regional airports. There is usually an incremental increase in runway length/strength justified by safety, which results in more traffic. Then there are increased taxiways and finally a crosswind of perpendicular runway to handle bigger airplanes. I believe this is the first step in evolution to Aurora regional airport. I encourage citizens to stay involved in this process if they are concerned. Citizens must continue to speak up.

Phil Swain (Chief pilot of Aurora Aviation): I also do safety management consulting in aviation. It is not true to say longer runways don't promote safety. Safety plans need to look at the capacity of the airport. Aurora is extremely limited with the approaches we have. That in and of itself means you can't get into Aurora. Also, we have a lot of mixed traffic—jet aircraft, reciprocating aircraft. Trying to forestall a tower and runway lengthening demonstrates a lack of foresight into what the future will bring in terms of economic growth, whether we like it or not. We need to look at this from a safety and usability perspective. This is not just about a few big businesses coming in. This is an area that needs the economic growth. We need to look down the road for future and economic viability.

Brian Oliver (Employee at Aurora Aviation and resident of Multnomah County): I am an employee that commutes to Aurora. I stop in the stores in Wilsonville and eat in restaurants. I shuttle visitors to the area. The economic growth is there. I have learned that growth is inevitable. We will all experience it. The airport will continue to grow. I am a student pilot. I have been fascinated to hear the armchair aviation that occurs in these kinds of public forums. A lengthened runway will increase safety. We need to listen to the experts and those who understand aviation. We can't look at an airplane on a ramp and make a judgment on it just because we are impacted by something tangential to the safety issue.

Ken Ivey (Chair of an unincorporated communities planning organization in Clackamas County): The noise plans are not being respected very much. In Charbonneau, I had a leer jet over my house, and that is common. People aren't following the noise abatement routes. If you want to justify expansion, you need to control your pilots and get noise abatement in place.

Annie Kirk (Aurora citizen and Marion County resident): I appreciate the comments made about mitigating noise. I would ask that when Charbonneau residents make noise comments, you would include the City of Aurora. I am against lengthening of the runway and agree with the Charbonneau representative that strengthening is okay. If any other alternatives come to pass, those on mailing list should understand they have an opportunity to comment. When the add-ons were made, I was unaware so did not comment.

Next steps

Rainse explained that the comment form would be online for the next two weeks. The next item of business will be a presentation to the Oregon Aviation Board looking for direction from them as to how to move forward with the ALP and the CIP on the 23rd of June. A PAC workshop will follow regarding the ALP and the CIP.

Joe Smith, Oregon Aviation Board said that he came to the meeting to listen and he listened very carefully. He has taken the time to read every comment on the website, and by June 23rd, will read everything on the website and that comes his way. He said there are a couple of things that people should be aware of: First, he is totally in favor of there being a tower for safety and for the best way to see that pilots are obeying flight patterns and noise abatement procedures. Second, he said he has to confess that he's very underwhelmed by the road/traffic arguments. The idea that there is going to be a significant increase in traffic is hard to believe. Before any extension happens, a number of studies would have to take place, and people would have to be compensated for their property. The thing to remember is that what goes into the ALP is not necessarily going to happen, but what doesn't won't happen. He said he really appreciates people attending, staying late and providing feedback.

Tony Holt asked what preferred alternative will be presented to the Aviation Board. Joe responded that he doesn't know where the idea of a preferred alternative came from. He said it's not the business of the consultant. It is the business of the consultant to look at all the possible options. He believes the word preferred has to go away. Rainse responded that they have to get to an ALP and to do so, they will get together with staff from ODA and Mark Gardiner from the Aviation Board to determine how they will present the material to the Aviation Board. Mitch added that it is a Board decision and they will make the call. They have postponed that decision twice. Mitch said that all feasible alternatives will be presented to the Board for consideration and decision.

The meeting adjourned at approximately 7:45 p.m.

Aurora State Airport Master Plan Update – Planning Advisory Committee (PAC) Meeting #5

June 7, 2011
Maplewood Grange Hall
5:00 – 7:00 pm

SIGN IN SHEET

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Aurora State Airport Master Plan Update – Planning Advisory Committee (PAC) Meeting #5

June 7, 2011
Maplewood Grange Hall
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Aurora State Airport Master Plan Update – Planning Advisory Committee (PAC) Meeting #5

June 7, 2011
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5:00 – 7:00 pm

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Jeff Ward	Professional Pilots	2827 SW Morningside Ave-Wilsonville	OR 97070 503-348-1119	
Sally Pond	Charbonneau	32552 SW Riviera Dr	503-694-2679	Sallypo1@Comcast.net
Dr. Joe Dusterman	Charbonneau	32220 SW Armitage Pl. - Wilsonville	503 803 0846	jhd@pacificu.edu

Aurora State Airport Master Plan Update – Planning Advisory Committee (PAC) Meeting #5

June 7, 2011
Maplewood Grange Hall
5:00 – 7:00 pm

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Bruce Bennett	Aurora Grower	P.O Box 127	503-678-1217	
R.P. Jenks	Self-Farmer	14198 Keil Rd NE Aurora OR	503 675-3371	N/A
David Olmstead	neighborhood	8220 SW FAIRWAY DR. 97070	503-694-2821	
WAYNE HUBBARD	Self	14747 ALDERSWAY NE Aurora	503 6782009	
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Aurora State Airport Master Plan Update – Planning Advisory Committee (PAC) Meeting #5

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5:00 – 7:00 pm

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Florence Sexton	"	32645 SW Lake Ft. Court Wilsonville 97070		
Brian Horler	"	8177 SW VILLAGE GREENS CIR, WILSONVILLE		
Virginia Horler	"	" " " " " "		
NICK KAUSH	Aurora			
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Phil Swain	Sunny Hill Consulting	871 Chara Ct Lake Oswego OR	503 329-7943	swaphil@aol.com
Rick Koski	Deer Creek	22073 Floral Ave NE Aurora	503-678-3063	Ricky Hickky@hotmail.com
Sally Kingston	Charbonneau			
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Dan Sullivan	Aurora	P.O. Box 34 Aurora 97002		

Aurora State Airport Master Plan Update – Planning Advisory Committee (PAC) Meeting #5

June 7, 2011
Maplewood Grange Hall
5:00 – 7:00 pm

SIGN IN SHEET

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Aurora State Airport Master Plan

Planning Advisory Committee (PAC) Meeting #6

September 15, 2011
North Marion School District, Intermediate School, Aurora, OR

MEETING SUMMARY

Attendees

Oregon Department of Aviation (ODA) – Mitch Swecker, Heather Peck , Sandra Larsen, and John Wilson

WHPacific – Rainse Anderson and Sarah Lucas

JLA Public Involvement –Adrienne DeDona and Sylvia Ciborowski

Public Advisory Committee (PAC) –Greg Taylor (new Aurora Mayor), Ray Phelps, Randy Carson, Patti Milne, Nick Kaiser, Jim Hansen, Tony Helbling, Bruce Bennett, Tony Holt, Mark Ottenad (alternate for Wilsonville), Fred Netter, David Waggoner, and Alternate for Dan Riches, Columbia Helicopters.

Public Attendees – see attached sign in sheets

Welcome and Introductions:

Mitch Swecker, Director of the Oregon Department of Aviation (ODA), welcomed the group and kicked-off the meeting. Mitch introduced Heather Peck, ODA's new construction project manager and Greg Taylor, the new mayor of Aurora.

Rainse Anderson introduced himself as the project manager for the Aurora Airport Master Plan update. Rainse introduced Sarah Lucas, project planner and John Wilson and Sandy Larsen from ODA. Rainse explained that there were comment forms and sign in sheets at the front for people to leave written comments at the meeting or send to staff later. Comments can also be made through the project website. Comments will be taken until Sept. 30th. Rainse added that this is the last meeting for the project and that he's enjoyed working with the community here in Aurora.

Rainse reviewed the meeting agenda which includes a project update and presentation on Chapters 6 and 7 (Airport Layout Plan and Capital Facilities Plan). Rainse reminded the public that this is a working session for the PAC and during the presentation, PAC members may have questions, but the public is asked to hold their comments until the end of the meeting. He explained there would be a break for a public workshop during which time the public and the PAC members could review project materials and interact with staff to ask detailed questions about Chapters 6 and 7. After the public workshop, the PAC will reconvene to discuss what was heard, then there will be time for public comment.

Rainse reviewed the project purpose, which is to update the 20 year plan that will guide the future development of the Airport. He went on to explain that at previous meetings, we have reviewed the first five chapters of the Master Plan document. We will now begin review of the Airport Layout Plan and the Capital Improvement Plan. Over the last five months, several alternatives were developed and public comment was generated related to these alternatives. Following public comment, project staff presented the outcomes to the ODA Board on April 28th, where they came up with the displaced threshold concept. The Board requested another public meeting to discuss the displaced threshold. Public comment was generated on the displaced threshold option until June 21st. At that time the ODA Board gave the direction to move forward with the 800-foot displaced threshold to the north, so that will be presented to the FAA within the draft Master Plan as the preferred option. If the FAA does not approve the displace threshold, a 1,000-foot extension to the South would be recommended for their review and opinion. Only one option will be carried forward.

Displaced threshold:

Rainse explained the displaced threshold option, which is recommended to mitigate the runway length deficiency at Aurora Airport. The following distances will be included in the displaced threshold option.

- Take-off run available (TORA): Runway 35, 5,004 feet and Runway 17, 5,804 feet
- Take-off distance available (TODA): Runway 35, 5,004 feet and Runway 17, 5,804 feet
- Accelerate-Stop distance (ASDA): Runway 35, 5,004 feet and Runway 17, 5,804 feet
- Landing Distance Available (LDA): Runway 35, 5,004 feet and Runway 17, 5,004 feet

Note: there is no change to the landing distance available.

Runway extension to the South:

Rainse explained the various concepts included in the proposed 1,000 foot runway extension to the South. The following distances will be included in the displaced threshold option.

- Take-off run available (TORA): Runway 35, 6,004 feet and Runway 17, 6,004 feet
- Take-off distance available (TODA): Runway 35, 6,004 feet and Runway 17, 6,004 feet
- Accelerate-Stop distance (ASDA): Runway 35, 6,004 feet and Runway 17, 6,004 feet
- Landing Distance Available (LDA): Runway 35, 6,004 feet and Runway 17, 6,004 feet

This option would require property acquisition, however pavement options are all on property owned by the Airport.

PAC Discussion:

Bruce Bennett asked why the landing distance wasn't extended in the displaced threshold. Rainse replied that this is how the displaced threshold is calculated since the pavement is only usable in one direction. Bruce asked if it can be considered as a stop-way. Sarah replied that you can only use the 5,000 feet to calculate the distance available. Bruce asked if the Runway 17 run-up pad was shown. Rainse replied that it was included in both alternatives, however it is shifted down to the very end of Runway 17 in the displaced threshold scenario. Rainse also added that easement acquisition is needed at Columbia Helicopters for the displaced threshold to the North.

Chapter 6 – Airport Layout Plan:

Rainse reviewed the Airport Layout Plan (Chapter 6). He explained that the Airport Layout Plans are a pictorial culmination of the master planning process. In order to be eligible to receive funding from the FAA, projects must be shown in the FAA-approved Airport Layout Plan. The drawings include:

- Cover sheet
- Airport Layout Plan
- Airport Airspace
- Airport Approach Surfaces
- Inner Portion of the Runway 17/35 Approach Surfaces
- Terminal Area Plan
- Land Use and Noise Contours
- Runway Departure Surfaces
- Airport Property Map

The Airport Layout Plan includes runway safety areas, displaced thresholds, location for the control tower (northern – CAA ramp area), fire station (centrally located), service road, relocation/closure of Keil Road, and modification of the runway object free area.

PAC Discussion:

Fred Netter said that at the last meeting, we talked about the tower and its proximity to the fire station and there being an issue with homeland security. He asked how close the tower is to the fire station in the Airport Layout Plan and whether that will be an issue. Mitch replied that ODA has appealed this to the FAA and the threat didn't justify the security clearance. Fred asked whether it is possible to connect the fire station facility to other buildings. Mitch replied that if there is some way of funding it from a grant or other source, then that would make it feasible. He added that if there is outside funding, they should talk. Fred replied that there might be other funding sources available. Mitch added that they would need to identify funding, etc. pretty quickly since an engineer has already been hired for the control tower.

Nick Kaiser asked if there are any changes in the previous chapters based on discussions with the ODA Board, such as the land use areas, etc. Rainse replied that in the alternatives chapters, we outlined all the issues relative to the alternatives discussed at that time, and the chapter content will remain the same since it provides the context for developing the preferred alternative shown in the ALP. Mitch added that if ODA gets approval for the displaced threshold distances to the north, you would probably see airplanes taking off to the south. Nick asked if there will be any changes in the noise levels.

Tony Holt suggested including the assumptions related to departures on the maps that show the conditions for 2010. Rainse replied these are listed in Chapter 5, but they can be summarized on the ALP noise drawings as well.

Chapter 7 – Capital Improvement Plan:

Sarah reviewed the Capital Improvement Plan Chapter and explained that this provides the basis for implementing the improvements in the Master Plan. She also explained that the Capital Improvements would be implemented within three separate phases:

- Short-term (Phase I): 2012-2016
- Intermediate-term (Phase II): 2017-2021
- Long-term (Phase III): 2022-2031

A Financial implementation analysis was also conducted to examine the various facets of the financial operating condition of the Airport. The Capital Improvement Plan is a living document and is updated as projects are completed or priorities change. As of right now, this is the prioritization of projects:

Phase I:

1. Construct Air Traffic Control Tower (ATCT) – 2012
2. Service Road – 2012
3. Pavement Maintenance – 2013
4. Helicopter Landing Pads – 2014
5. Ramp reconstruction – state leased – 2014
6. Taxi-lane Development (Hangar Access) - 2014
7. Hangar Development – 2015
8. Carryover Entitlements – 2015
9. Environmental Assessment for Runway Improvements – 2016
10. Pavement Maintenance – 2016

Total cost of Phase I Improvements - $8 million (ODA share = $583,000, FAA share = $2.5 million, Private share = $2.1 million, other funding = $2.7 million)

Phase II:

11. Aurora Fire Response Facility – 2017
12. Carryover Entitlements – 2017

Displaced Threshold Improvements Only:

13. Property Acquisition – 2018
14. Avigation Easement Acquisition – 2018
15. Carryover Entitlements – 2019
16. 800 foot Displaced Threshold to the north – 2020
17. Install Runway – 2020
18. Runway 17 Run-up Area – 2020

Runway Extension to the South Only:

19. Property Acquisition – 2018
20. Keil Road Relocation – 2019
21. Runway 35 1,000 Extension to the south – 2020
22. Install Runway 17 Precision Approach – 2020

Other improvements not related to above alternatives:

23. Pavement Maintenance – 2019
24. Taxi-lane development (hangar access) – 2019
25. Runway 17 & 35 Strengthening Overlay – 2020
26. Hangar Development – 2021
27. Master Plan Update – 2021

Total cost of Phase II Improvements - $7.6 million for Displaced Threshold (ODA share = $263,000, FAA share = $4.6 million, Private share = $2.7 million). $12 million for Runway Extension to the South (ODA share = $487,000, FAA share = $8.9 million, Private share = $2.7 million).

Phase III (2022 – 2031):

28. Pavement Maintenance
29. Apron Development/Run-up area
30. Taxi-lane development (Hangar Access)
31. Hangar Development
32. Cargo Apron
33. Relocate Fuel Tanks
34. Runway 17 run-up area

Total cost of Phase III improvements – $4.5 million (ODA share = $200,000, FAA share = $2.2 million, Private share = $2.1 million)

Sarah explained that ODA and the FAA share the cost of improvements. The Airport pays 5% and FAA pays the remainder for the majority of Airport Improvement Program (AIP)-eligible projects. One exception would be pavement maintenance through the Pavement Maintenance Program, where the Airport supplies 75% of the funding. Items related to hangar development were shown to be 100% private funding, as the FAA rarely funds revenue-generating projects.

Sarah explained that the financial analysis explored the feasibility of implementing these projects. This process entailed looking at the following conditions at the Airport:

- Financial operating condition
- Historical operating revenues and expenses
- Projected future revenues and expenses, with focus on Capital Improvement Plan development phases

The approach to the analysis was to:

- Review financial documents
- Evaluate rates and charges
- Review existing operating and financial environment
- Review Master Plan Capital Improvement Plan
- Analyze sources and timing of capital funding
- Analyze historic and projected operating revenues and expenses

Sarah said that the historical operating revenue and expenses at Aurora State are included in two funds – Public Transportation and Capital Projects. The following shows the revenues and expenses for both funds:

Public Transportation Fund	**FY2007**	**FY2008**	**FY2009**	**FY2010**
• Licenses and fees	$869.64	$116,748	$122,970	$128,358
• Rents and royalties	$149,206	$55,342	$44,461	$63,428
• Other misc. revenues	$11,833	$1,807	$11,649	$12,310
Revenues	*$161,909*	*$173,898*	*$179,081*	*$204,096*
• Salaries and wages	$19,288	$19,234	$19,263	$14,426
• Services, supplies, other	$65,793	$56,667	$38,435	$81,609
Expenses	*$85,081*	*$75,901*	*$57,698*	*$96,035*
Operating Income	*$76,827*	*$97,996*	*$122,382*	*$108,060*
Capital Projects Fund	**FY2007**	**FY2008**	**FY2009**	**FY2010**
• Revenues	$207,856	$2,905,882	$1,857,084	$13,198
• Expenses	$155,561	$3,524,431	$1,005,192	
Fund total	*$52,294*	*$(618,548)**	*$851,891*	*$13,198*

*Taxiway relocated

The projected Aurora State operating revenues and expenditures for the Public Transportation Fund are shown below.

- The Capital Project Fund is not shown as it is dependent upon eligibility and grant availability, which fluctuates.
- Does not include federal or other grant revenues or professional service expenses as they will vary and do not reflect true operating income.

Public Transportation Fund	**Current FY2011**	**FY2015**	**FY2020**	**FY2025**	**FY2030**
• Licenses and fees	$128,358	$145,000	$176,000	$224,000	$300,000
• Rents and Royalties	$63,428	$71,000	$87,000	$111,000	$148,000
• Other misc. revenues	$12,310	$14,000	$17,000	$22,000	$29,000
Revenues	*$204,096*	*$230,000*	*$280,000*	*$357,000*	*$477,000*
• Salaries and wages	$14,337	$16,000	$19,000	$24,000	$33,000
• Services, supplies, other	$96,035	$108,000	$128,000	$164,000	$219,000
Expenses	*$110,372*	*$124,000*	*$147,000*	*$188,000*	*$252,000*
Operating Income	*$93,723*	*$106,000*	*$133,000*	*$169,000*	*$225,000*

Sarah summarized the financial analysis by stating the following:

- Demand and the availability of financial resources for capital projects will dictate when facility improvements will be implemented.
- Continuation of the FAA's AIP entitlement program is essential for funding capital projects.

- The ODA does not allocate any indirect revenues or expenses to any of their 28 airports. Any additional ODA revenues would not be allocated to Aurora State Airport until the project costs are incurred and revenues are transferred.
- Based on ODA acceptance of the Capital Improvement Plan projects and the understanding that funding for the state's obligation will be met at the time of project implementation, the Capital Improvement Plan is financially feasible.

Sarah also noted that based on historic revenues, the ODA has funding to move forward with the first two phases of the Capital Improvement Plan.

PAC Discussion:

Tony commented that it was interesting that the cost to extend the runway to the South is two and half times the cost of the displaced threshold.

Bruce Bennett said he would like to point out that the revenues reported are 100% from aviation.

Public Workshop:

Sarah explained the format for the public workshop. Members of the public were then invited to review the display boards and ask project staff any questions during a 25-minute public workshop. Public comments were captured on flip charts by the facilitation team.

Adrienne and Sylvia recapped the comments heard from participants during the public workshop session:

- The sooner the better with improvements – especially the overlay because that will reduce maintenance costs and increase the life of the runway.
- Will there be any analysis of increased traffic at other airports by pilots who don't want to deal with the Aurora Air Traffic Control Tower after it is built?
- How do you prioritize the projects on the Capital Improvement Plan?
- What uses will be permitted on the service road?
- Are there caretaker facilities and can others be located on the airport?
- Run-up area is essential
- Why won't the run-up area be done sooner?
- Will the FAA buy off on the displaced threshold?
- Where/what are the required vertical clearances?
- What is the timing of the various improvements?
- Where will Keil Road be located to?
- Where will property acquisition/easement acquisition take place? What properties are impacted?
- What are the noise impacts/future flight patterns?
- Why are we doing the Master Plan Update?
- What is entailed in each alternative (Displaced Threshold and Runway Extension to the South)?
- Where are the developable properties?
- How will the Instrument Departure/noise mitigation process work?

Rainse explained that other than the Air Traffic Control Tower and the service road, there wouldn't be a lot of development over the next 5 years in order to save up entitlements for future improvements such as the runway extension or the displaced threshold. Mitch added that there are opportunities to re-prioritize projects based on need and available funding, such as the run-up area.

PAC Discussion:

Fred asked where Keil Road would be relocated to if relocation does occur. Rainse replied that is really up in the air at this time. He said they looked at the area and took a shot at it, but if and when that happens a variety of options will be reviewed if and when it comes up in the phasing plan. Mitch replied that it has to be coordinated with property owners and the County and there isn't a pre-determined outcome at this time.

Bruce recommended as a compromise, that the helicopter pads could be moved to make way for other projects even though it's a worthy project.

Jim asked if there was any way to move up the fire facility or co-locating it with another facility as opposed to duplicating utility needs, etc. He added that this would benefit the airport and the community. Fred replied that now that there is an engineer on board, he will arrange to talk with ODA to put something together. He asked whether or not the timeframe needed to conform with the phasing plan. Rainse said that the timing did not necessarily need to conform with the phasing plan since the funding is on the private side.

Mark asked if the service road was indicated on the Airport Layout Plan. Rainse replied that it was and indicated that it starts at the existing road and goes down to the existing taxilane (it is shown as a blue dashed line on the ALP). Fred asked if it started where you come off of Keil Road (near Metal Innovations). Rainse replied that it was.

Public Comment:

Karen Batte, lives on Ehlen Road. She stated that obviously with the tower coming in, you must be anticipating growth. What kind of growth are you anticipating and what are the impacts to Ehlen Road? At 5 p.m. it is blocked. How will you influence the state to get that road fixed? Mitch replied that this has been a discussion item at several meetings. He said that they will have to work with the County and the State when it comes to road improvements. Rainse said that as far as the tower is concerned, it is a safety related item, not to promote growth. The airport has been growing without the tower. It is a safety need to control aircraft movements in the air and on the ground. He said he could review the forecasts for future growth and type of aircraft with Ms. Batte after the meeting. Rainse added that staff are available for questions after the meeting for anyone who was interested.

Comment Forms- One public comment form was submitted with the following comments:
General comments regarding the Airport Layout Plan – Keil Road should not be closed or moved. The majority of local citizens and tax payers want the airport left as it is. No tower or Runway lengthening. I guess the local citizens have no say in this. These proceedings are dishonest and a waste of time.

Next Steps:

Rainse explained that there will be an opportunity for public comments on the two chapters until Sept. 30th. Comments may be submitted via comment forms at meeting or to staff or online.

The final draft will be prepared and submitted to the ODA Board and the FAA. It will also be available on the website for review. Notification will be sent to the PAC when available on the web.

Typically it takes 90 days for the FAA to review and approve an Airport Layout Plan. From there, the ODA will pursue adoption of the Master Plan as part of the Marion County Comprehensive Plan.

Mark Ottenad asked if the FAA's decision to adopt one of the two options would create some changes to the plan. Mitch replied that both options will be included in the Master Plan, but one will be indicated as the preferred alternative. He added that they are still going to present the 800-foot displaced threshold to the FAA and wait for them to say no before moving forward with any other option. Rainse said that after the decision is made, the document will be revised to show the chosen alternative. It will show the progression of the decision-making process. The other chapters will remain the same, but the Airport Layout Plan and the Capital Improvement Plan chapters will be updated. There will be a statement about what decision was made by the FAA.

Tony requested that when the final document is posted on the website, PAC members be notified where the significant changes are so they don't have to go through it page by page.

Jim asked whether the last time Master Plan update was adopted in the Marion County Comprehensive Plan. He said that we need to do it right this time and we need to answer questions about the impacts to roads and land use. He asked what the next step is for getting the plan adopted in the Marion County Comprehensive Plan. Nick replied that the County must agree to change the Comprehensive Plan, but it takes funds to do it because it's an extensive process. He said that doesn't mean you can't implement it, but the land use portions need to be brought on board. He added that the Master Plan does have land use impacts that need to be addressed. Patti said that the Comprehensive Plan adoption is another formal process with additional opportunity for public input, but we will have something to work from that will be presented and requested to be adopted. She added that doesn't eliminate anyone from coming forward and sharing any concerns that they might have. Jim said he really wants to make sure it gets adopted as part of the Comprehensive Plan because that could help developers as well as create a greater understanding of the Master Plan. He said that we should make sure we are able to produce a profit and make some money for the community.

Rainse thanked everyone on the PAC and the hard work they've done and thanked the public for coming out and asking questions.

Jim thanked Rainse and the consultant team for the work they've done.

Mitch thanked WHPacific, ODA staff and those that aren't here and have since moved on. He also thanked the PAC for spending their time studying the issues and making comments. He thanked the

public for their time and participation. He also stated the PAC and public comments had influenced and changed the course of the Master Planning process.

Meeting adjourned at approximately 6:45 p.m.

Aurora State Airport Master Plan Update – Planning Advisory Committee (PAC) Meeting #6

September 15, 2011
North Marion Intermediate School
5:00 – 7:00 pm

SIGN IN SHEET

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Aurora State Airport Master Plan Update – Planning Advisory Committee (PAC) Meeting #6

September 15, 2011
North Marion Intermediate School
5:00 – 7:00 pm

SIGN IN SHEET

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Patti Milne	Marion Co. Commissioner	P.O. Box 14500 Salem	503 589.3268	
Nick Kaster	Aurora Planning	14035 Ickes Ct Aurora	503 678 1551	
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DICK SPENCE	Chairman	8420 S.W. Curry Dr Wilsonville	503-694-5875	on file
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M L Duckworth		9400 SW Tauchman #26 Wilsonville	503-682-0366	

Aurora State Airport Master Plan Update – Planning Advisory Committee (PAC) Meeting #6

September 15, 2011
North Marion Intermediate School
5:00 – 7:00 pm

SIGN IN SHEET

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Karen & Tom Doupe	Self	13453 Ehlen Rd. NE Aurora		khty@mac.com

Appendix F:
OREGON AVIATION PLAN (OAP) INDIVIDUAL REPORT

Airport Master Plan Update

Aurora State Airport

WHPacific
OREGON DEPARTMENT OF AVIATION

Chapter 1 Introduction

The state of Oregon has an extensive aviation system spread throughout the state, providing valuable transportation options for the public, which range from small emergency use airports in remote regions to the extensive passenger enplanements at Portland International. Managing such a large and diverse system of airports can be a daunting task if a comprehensive plan is not in place to serve as a guide. In addition, with the ever-increasing demands for project funding, it is imperative that the Oregon Department of Aviation (ODA) have a solid inventory, understanding of need, and plan for development for the entire state aviation system to meet the needs of existing and future development.

This report is a combination of three studies, which will guide the development of the aviation system in Oregon for years to come. This document is organized into three distinct sections. *Chapter Two* summarizes the overall study goals, roles, and methodologies used to develop the study. *Chapter Three* is a summary of the various inventory efforts associated with the individual airport facilities. *Chapter Four* contains specific roles, recommendations, and funding options for the airport. This report will provide each community with information, which can guide the development of each facility in an orderly, economic, and environmentally friendly manner.

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Chapter 2

The growing aviation demand in Oregon has prompted the Oregon Department of Aviation (ODA) to update the previous State Aviation System Plan published in 2000 and develop economic impact assessments that gauge the benefits of aviation to the state. Oregon is currently experiencing an unprecedented growth in population as well as aircraft operations. In order for the state to continue to provide a safe and efficient aviation system while accommodating growth, it is important to evaluate what facilities and capabilities are here today and what will be needed for tomorrow.

This chapter is organized into the following sections:

2.1 *Oregon Aviation Plan 2007* (*OAP 2007*) Study Components
2.2 Overall Study Goals & Objectives
2.3 Airport Functional Roles
2.4 Performance Measures
2.5 Summary

2.1 *Oregon Aviation Plan 2007 (OAP 2007)* Study Components

Three unique studies were originally undertaken which resulted in the development of the *OAP 2007*. This included a traditional state aviation system plan update which was developed to meet Federal Aviation Administration (FAA) requirements. An economic impact study was completed to assess the economic value of the aviation system at the state and local levels. The state aviation master plan component evaluated airports not included within the traditional state system plan criteria, as well as evaluating additional areas of interest or special consideration topics. The aforementioned goals were originally distributed over these three separate studies as outlined above, however, since there were numerous commonalities between the studies, they were combined into a single report for greater ease of use. Additional detail on each of these three studies is listed below. The information contained in the *OAP 2007* is the compilation of information, findings, and recommendations for all three studies.

2.1.a State Aviation System Plan

The *OAP 2007* addresses many different issues related to each individual airport and regional and state aviation system components. It is important to have a comprehensive understanding of the existing facilities, the need for future facilities, and the feasibility of reaching future goals. A state aviation system plan update is based upon sound evaluation of existing facilities, coupled with a clear understanding of the state and nation aviation interests, as well as the needs of the general public. The methodology used to evaluate the state system is consistent with that advocated for use by the FAA in Advisory Circular (AC) 150/5070-7 — *The Airport System*

Planning Process, issued November 10, 2004. All 97 public-use airports are listed in **Table 2.1** – **Public-Use Airports in Oregon**. Their associated city, FAA classification, and their type of ownership are noted within the table.

The *OAP 2007* includes 66 public-use airports, which are part of the National Plan of Integrated Airport Systems (NPIAS). The study group of airports was based upon extensive coordination with the ODA and the FAA. The study group includes the 57 airports currently listed on the NPIAS, eight state-owned airports which serve either a recreational/tourism base or have more than two based aircraft, and one privately owned airport, which serves a significant number of based aircraft.

2.1.b State Aviation Master Plan

The state aviation master plan element of the *OAP 2007* was included to ensure a comprehensive evaluation of all public-use airports within Oregon and was funded independently by the ODA. There are an additional 31 public-use airports in Oregon that were not included in the federally funded state aviation system plan component (NPIAS). These airports were evaluated using the same methodology of the state aviation system plan to provide the ODA a complete inventory of the state's aviation system resources. In addition to the evaluation of individual airports, the state aviation master plan was designed to evaluate broader, more conceptual issues related to the entire state aviation system. The evaluation of these issues will help the ODA better manage and improve the state system of airports.

2.1.c State Aviation Economic Impact Study

With the movement towards a global economy, it is now recognized that airports are no longer just another mode of transportation. Airports are vital components of the economic engine that drives the state, regional, and local economic climate and it is essential the state system of airports support these economies by providing adequate facilities and services. This study will provide the ODA, individual communities, airports and governmental agencies, and politicians the opportunity to assess the economic value of the aviation system as a whole as well as each individual airport. All 97 public-use airports, as shown in **Table 2.1**, are included in the analysis.

Table 2.1 Public-Use Airports in Oregon

Associated City	*Airport Name*	*NPIAS Status*	*Ownership*
Albany	Albany Municipal Airport	Yes	Publicly Owned
Alkali Lake	Alkali Lake State Airport	No	Publicly Owned
Arlington	Arlington Municipal Airport	No	Publicly Owned
Ashland	Ashland Municipal Airport - Sumner Parker Field	Yes	Publicly Owned
Astoria	Astoria Regional Airport	Yes	Publicly Owned
Aurora	Aurora State Airport	Yes	Publicly Owned
Baker City	Baker City Municipal Airport	Yes	Publicly Owned
Bandon	Bandon State Airport	Yes	Publicly Owned
Beaver Marsh	Beaver Marsh Airport	No	Privately Owned
Bend	Bend Municipal Airport	Yes	Publicly Owned
Boardman	Boardman Airport	Yes	Publicly Owned
Brookings	Brookings Airport	Yes	Publicly Owned
Burns	Burns Municipal Airport	Yes	Publicly Owned
Cascade Locks	Cascade Locks State Airport	No	Publicly Owned
Cave Junction	Illinois Valley Airport	Yes	Publicly Owned
Chiloquin	Chiloquin State Airport	Yes	Publicly Owned
Christmas Valley	Christmas Valley Airport	Yes	Publicly Owned
Clearwater	Toketee State Airport	No	Publicly Owned
Condon	Condon State Airport – Pauling Field	Yes	Publicly Owned
Cornelius	Skyport Airport	No	Privately Owned
Corvallis	Corvallis Municipal Airport	Yes	Publicly Owned
Cottage Grove	Cottage Grove State Airport – Jim Wright Field	Yes	Publicly Owned
Crescent Lake	Crescent Lake State Airport	No	Publicly Owned
Creswell	Creswell Hobby Field	Yes	Publicly Owned
Culver	Lake Billy Chinook Airport	No	Privately Owned
Denmark	Cape Blanco State Airport	No	Publicly Owned
Enterprise	Enterprise Municipal Airport	No	Publicly Owned
Estacada	Valley View Airport	No	Privately Owned
Eugene	Eugene Mahlon Sweet Field	Yes	Publicly Owned
Florence	Florence Municipal Airport	Yes	Publicly Owned
Florence	Lake Woahink Seaplane Base - *closed*	No	Privately Owned
Gates	Davis Field	No	Privately Owned

Table 2.1 Public-Use Airports in Oregon (Continued)

Associated City	*Airport Name*	*NPIAS Status*	*Ownership*
Gleneden Beach	Siletz Bay State Airport	Yes	Publicly Owned
Gold Beach	Gold Beach Municipal Airport	Yes	Publicly Owned
Grants Pass	Grants Pass Airport	Yes	Publicly Owned
Hermiston	Hermiston Municipal Airport	Yes	Publicly Owned
Hillsboro	Stark's Twin Oaks Airpark	No	Privately Owned
Hood River	Ken Jernstedt Airfield	Yes	Publicly Owned
Hubbard	Lenhardt Airpark	No	Privately Owned
Imnaha	Memaloose Airport (USFS)	No	Publicly Owned
Independence	Independence State Airport	Yes	Publicly Owned
John Day	Grant County Regional Airport – Ogilvie Field	Yes	Publicly Owned
Joseph	Joseph State Airport	Yes	Publicly Owned
Klamath Falls	Klamath Falls Airport	Yes	Publicly Owned
La Grande	La Grande / Union County Airport	Yes	Publicly Owned
Lakeside	Lakeside Municipal Airport	No	Publicly Owned
Lakeview	Lake County Airport	Yes	Publicly Owned
Lebanon	Lebanon State Airport	Yes	Publicly Owned
Lexington	Lexington Airport	Yes	Publicly Owned
Madras	Madras City - County Airport	Yes	Publicly Owned
Malin	Malin Airport	No	Publicly Owned
Manzanita	Nehalem Bay State Airport	No	Publicly Owned
McDermitt	McDermitt State Airport	Yes	Publicly Owned
McKenzie Bridge	McKenzie Bridge State Airport	No	Publicly Owned
McMinnville	McMinnville Municipal Airport	Yes	Publicly Owned
Medford	Rogue Valley International – Medford Airport	Yes	Publicly Owned
Monument	Monument Municipal Airport	No	Publicly Owned
Myrtle Creek	Myrtle Creek Municipal Airport	Yes	Publicly Owned
Newberg	Chehalem Airpark	No	Privately Owned
Newberg	Sportsman Airpark	Yes	Privately Owned
Newport	Newport Municipal Airport	Yes	Publicly Owned
North Bend	Southwest Oregon Regional Airport	Yes	Publicly Owned
Oakridge	Oakridge State Airport	No	Publicly Owned
Ontario	Ontario Municipal Airport	Yes	Publicly Owned
Owyhee	Owyhee Reservoir State Airport	No	Publicly Owned

Table 2.1 Public-Use Airports in Oregon (Continued)

Associated City	*Airport Name*	*NPIAS Status*	*Ownership*
Pacific City	Pacific City State Airport	No	Publicly Owned
Paisley	Paisley Airport	No	Publicly Owned
Pendleton	Eastern Oregon Regional Airport at Pendleton	Yes	Publicly Owned
Pinehurst	Pinehurst State Airport	No	Publicly Owned
Portland	Portland Downtown Heliport	Yes	Publicly Owned
Portland	Portland International Airport	Yes	Publicly Owned
Portland	Portland Hillsboro Airport	Yes	Publicly Owned
Portland	Portland Mulino Airport	Yes	Publicly Owned
Portland	Portland Troutdale Airport	Yes	Publicly Owned
Powers	Powers Hayes Field	No	Publicly Owned
Prineville	Prineville Airport	Yes	Publicly Owned
Prospect	Prospect State Airport	No	Publicly Owned
Redmond	Redmond Municipal Airport - Roberts Field	Yes	Publicly Owned
Rome	Rome State Airport	No	Publicly Owned
Roseburg	Roseburg Regional Airport	Yes	Publicly Owned
Roseburg	George Felt Airport	No	Privately Owned
Salem	Salem McNary Field	Yes	Publicly Owned
Sandy	Country Squire Airpark	No	Privately Owned
Sandy	Sandy River Airport	No	Privately Owned
Santiam Junction	Santiam Junction State Airport	No	Publicly Owned
Scappoose	Scappoose Industrial Airpark	Yes	Publicly Owned
Seaside	Seaside Municipal Airport	Yes	Publicly Owned
Silver Lake	Silver Lake Strip (USFS)	No	Publicly Owned
Sisters	Sisters Eagle Air Airport	No	Privately Owned
Sunriver	Sunriver Airport	Yes	Privately Owned
The Dalles	Columbia Gorge Regional Airport – The Dalles Municipal Airport	Yes	Publicly Owned
Tillamook	Tillamook Airport	Yes	Publicly Owned
Toledo	Toledo State Airport	No	Publicly Owned
Vale	Miller Memorial Airpark	No	Publicly Owned
Vernonia	Vernonia Municipal Airport	No	Publicly Owned
Waldport	Wakonda Beach State Airport	No	Publicly Owned
Wasco	Wasco State Airport	Yes	Publicly Owned

2.2 Overall Study Goals & Objectives

The primary goal of the three studies is to provide a comprehensive plan which addresses all public-use airports in the state of Oregon and which identifies how to improve individual airports as part of the larger state system, to meet the needs of tourism, economic development, and transportation services for each community and the state as a whole.

This information provides the framework that supports informed decisions related to planning and developing the Oregon aviation system. The objectives of these studies are to:

- Assess aviation facilities: including airside, landside, and ground facilities and services, and general aviation needs
- Assess the economic value of airport facilities to the host community as well as the overall importance to the state
- Provide guidance for the development of the Oregon system of airports to meet the state's future aviation needs to ensure the safety and efficiency of the state aviation system
- Enhance communication opportunities among ODA, airport sponsors, local government, other state and federal agencies, and airport users so that the future development of the state aviation system can be more readily accomplished
- Provide each airport the direction to develop their airport to meet the needs of the state aviation system and local community as well as promote the airport for the purposes of economic development and tourism

Each of these individual studies is a portion of the overall process necessary to create a systematic approach to meeting the improvements which are identified, as well as proposing development strategies. This report provides a summary of the results of three planning studies undertaken by ODA to assess the condition of the existing aviation infrastructure, the economic benefit of the aviation industry, and the passenger demands for air service.

2.3 Airport Functional Roles

Each airport in the state impacts the overall operational capacity and efficiency of the state aviation system by supporting different types and levels of aviation activity. The types of facilities and services that should be provided at each category of airport were determined throughout the development of this plan. Airport functional roles have been broken out into five categories and the following criteria were utilized to classify the airports:

- Current airport infrastructure, facilities, and services
- Aviation activity levels and type of aviation demand served
- Ability to accommodate future growth
- Accessibility and geographic service area

The five airport functional roles are defined on the following page.

Category I – Commercial Service Airports

These airports support some level of scheduled commercial airline service in addition to a full range of general aviation aircraft. This includes both domestic and international destinations.

Category II – Urban General Aviation Airports

These airports support all general aviation aircraft and accommodate corporate aviation activity, including business jets, helicopters, and other general aviation activity. These airports' primary users are business related and service a large geographic region or they experience high levels of general aviation activity.

Category III – Regional General Aviation Airports

These airports support most twin- and single-engine aircraft and may also accommodate occasional business jets. These airports support a regional transportation need.

Category IV – Local General Aviation Airports

These airports support primarily single-engine, general aviation aircraft, but are capable of accommodating smaller twin-engine general aviation aircraft. These airports support local air transportation needs and special use aviation activities.

Category V – RAES (Remote Access/Emergency Service) Airports

These airports support primarily single-engine, general aviation aircraft, special use aviation activities, and access to remote areas or provide emergency service access.

Volume I of the *OAP 2007* displays all airports within their various categories.

2.4 Performance Measures

Airport performance measures were developed for the functional roles. These objectives were developed in cooperation with ODA and the state aviation system plan and master plan Advisory Committee. The purpose of the performance measures is to compare existing airport facilities to the minimum and desired facility criteria for each functional role. The performance measures should not be considered a requirement for development standards and any development would require additional support and justification through the airport master planning process as well as environmental documentation.

The performance measures for each functional role are defined below. Many airports have multiple runways; therefore, the primary runway for each airport was used to evaluate the facility against the performance measures.

Category I – Commercial Service Airports

These airports support some level of scheduled commercial airline service in addition to a full range of general aviation aircraft. This includes both domestic and international destinations.

Performance criteria were evaluated by analyzing each airport's primary runway. A complete description of airport facilities is located below.

Airside Facilities	**Minimum Criteria**	**Desired Criteria**
FAA - ARC	C-II	Varies
NPIAS	Yes	Yes
Based Aircraft	Not an Objective	Not an Objective
Runway Orientation	Varies by Airport	Varies by Airport
Runway Length	6,000 feet	Varies by Aircraft
Runway Width	100 feet	Varies by Aircraft
Runway Pavement Type	Bituminous, Concrete	Bituminous, Concrete
Runway Pavement Strength	Varies by Airport	Varies by Airport
Runway Pavement PCI	Varies by Airport	Varies by Airport
Taxiways	Full Parallel	Full Parallel/High Speed Exits
Approach Type	Precision	Precision
Visual Approach Aids	Both Runway Ends	Both Runway Ends
Instrument Approach Aids	One Runway End	Both Runway Ends
Runway Lighting	MIRL/HIRL	MIRL/HIRL
Taxiway Lighting	MITL/HITL	MITL/HIT

General Facilities	**Minimum Criteria**	**Desired Criteria**
Rotating Beacon	Yes	Yes
Lighted Wind Indicator	Yes	Yes
Weather Reporting	AWOS/ASOS	AWOS/ASOS
Hangared Aircraft Storage	75% of Based Aircraft	100% of Based Aircraft
Apron Parking/Storage	75% of Daily Transient	100% of Daily Transient
Terminal Building	Yes	Yes, Gates and Covered Walkways
Auto Parking	Moderate	Adequate
Fencing	Perimeter	Perimeter
Cargo	Small Handling Facility w/ Apron	Handling Facility w/ Apron
Deicing Facility	Yes	Yes, 24 hour

Services	**Minimum Criteria**	**Desired Criteria**
Fuel	100 LL & Jet A	100 LL & Jet A, 24 hour service
FBO	Full Service, 24 hour service	Full Service, 24 hour service
Ground Transportation	Rental Car, Taxi, or Other	Rental Car, Taxi, or Other
Food Service	Coffee Shop/Deli & Cold Foods	Restaurant
Restrooms	Yes	Yes
Pilot Lounge	Yes w/ Weather Reporting Station	Yes w/ Weather Reporting Station
Snow Removal	Yes	Yes
Telephone	Yes	Yes

Category II – Urban General Aviation

These airports support all general aviation aircraft and accommodate corporate aviation activity, including business jets, helicopters, and other general aviation activity. These airports' primary users are business related and service a large geographic region or they experience high levels of general aviation activity.

Performance criteria were evaluated by analyzing each airport's primary runway. A complete description of airport facilities is located below.

Airside Facilities	**Minimum Criteria**	**Desired Criteria**
FAA - ARC	C-II	Varies
NPIAS	Yes	Yes
Based Aircraft	Not an Objective	Not an Objective
Runway Orientation	Varies by Airport	Varies by Airport
Runway Length	5,000 feet	Varies by Aircraft
Runway Width	100 feet	Varies by Aircraft
Runway Pavement Type	Bituminous, Concrete	Bituminous, Concrete
Runway Pavement Strength	Varies by Airport	Varies by Airport
Runway Pavement PCI	Varies by Airport	Varies by Airport
Taxiways	Full Parallel	Full Parallel/High Speed Exit
Approach Type	Precision	Precision
Visual Approach Aids	One Runway End	Both Runway Ends
Instrument Approach Aids	Not an Objective	One Runway End
Runway Lighting	MIRL/HIRL	MIRL/HIRL
Taxiway Lighting	MITL/HITL	MITL/HITL

General Facilities	**Minimum Criteria**	**Desired Criteria**
Rotating Beacon	Yes	Yes
Lighted Wind Indicator	Yes	Yes
Weather Reporting	AWOS/ASOS	AWOS/ASOS
Hangared Aircraft Storage	75% of Based Aircraft	100% of Based Aircraft
Apron Parking/Storage	75% of Daily Transient	100% of Daily Transient
Terminal Building	Yes	Yes
Auto Parking	Moderate	Adequate
Fencing	Perimeter	Perimeter
Cargo	Designated Apron Area	Small Handling Facility w/ Apron
Deicing Facility	Not an Objective	Yes

Services	**Minimum Criteria**	**Desired Criteria**
Fuel	100 LL & Jet A	100 LL & Jet A, 24 hour service
FBO	Full Service	Full Service, 24 hour service
Ground Transportation	Offsite Rental Car, Taxi, or Other	Rental Car, Taxi, or Other
Food Service	Vending	Coffee Shop/Deli & Cold Foods
Restrooms	Yes	Yes
Pilot Lounge	Yes w/ Weather Reporting Station	Yes w/ Weather Reporting Station
Snow Removal	Yes	Yes
Telephone	Yes	Yes

Category III – Regional General Aviation

These airports support most twin- and single-engine aircraft and may also accommodate occasional business jets. These airports support a regional transportation need.

Performance criteria were evaluated by analyzing each airport's primary runway. A complete description of airport facilities is located below.

Airside Facilities	**Minimum Criteria**	**Desired Criteria**
FAA - ARC	B-II	Varies
NPIAS	Not an Objective	Not an Objective
Based Aircraft	Not an Objective	Not an Objective
Runway Orientation	Varies by Airport	Varies by Airport
Runway Length	4,000 feet	Varies by Aircraft
Runway Width	75 feet	Varies by Aircraft
Runway Pavement Type	Bituminous, Concrete	Bituminous, Concrete
Runway Pavement Strength	Varies by Airport	Varies by Airport
Runway Pavement PCI	Varies by Airport	Varies by Airport
Taxiways	Partial or Turnarounds	Full Parallel
Approach Type	Non-Precision	Precision
Visual Approach Aids	One Runway End	Both Runway Ends
Instrument Approach Aids	Not an Objective	Not an Objective
Runway Lighting	MIRL	MIRL/HIRL
Taxiway Lighting	MITL	MITL/HITL

General Facilities	**Minimum Criteria**	**Desired Criteria**
Rotating Beacon	Yes	Yes
Lighted Wind Indicator	Yes	Yes
Weather Reporting	AWOS/ASOS	AWOS/ASOS
Hangared Aircraft Storage	75% of Based Aircraft	100% of Based Aircraft
Apron Parking/Storage	30% of Daily Transient	50% of Daily Transient
Terminal Building	Small Meeting Area	Yes
Auto Parking	Minimal	Moderate
Fencing	Terminal Area	Perimeter
Cargo	Space on Existing Apron	Designated Apron Area
Deicing Facility	Not an Objective	Not an Objective

Services	**Minimum Criteria**	**Desired Criteria**
Fuel	100 LL & Jet A	100 LL & Jet A, 24 hour service
FBO	Full Service	Full Service, 24 hour service
Ground Transportation	Courtesy Car / Offsite Rental Car	Rental Car, Taxi, or Other
Food Service	Vending	Vending
Restrooms	Yes	Yes
Pilot Lounge	Yes w/ Weather Reporting Station	Yes w/ Weather Reporting Station
Snow Removal	Yes	Yes
Telephone	Yes	Yes

Category IV – Local General Aviation Airport

These airports support primarily single-engine general aviation aircraft but are capable of accommodating smaller twin-engine general aviation aircraft. These airports support local air transportation needs and special use aviation activities.

Performance criteria were evaluated by analyzing each airport's primary runway. A complete description of airport facilities is located below.

Airside Facilities	**Minimum Criteria**	**Desired Criteria**
FAA - ARC	B-I	B-II
NPIAS	Not an Objective	Not an Objective
Based Aircraft	Not an Objective	Not an Objective
Runway Orientation	Varies by Airport	Varies by Airport
Runway Length	3,000 feet Paved; 2,500 feet Turf	Varies by Aircraft
Runway Width	60 feet Paved; 120 feet Turf	Varies by Aircraft
Runway Pavement Type	Bituminous, Concrete, Turf	Bituminous, Concrete
Runway Pavement Strength	Varies by Airport	Varies by Airport
Runway Pavement PCI	Varies by Airport	Varies by Airport
Taxiways	Exits Needed	Partial or Turnarounds
Approach Type	Visual	Non-Precision
Visual Approach Aids	Not an Objective	One Runway End
Instrument Approach Aids	Not an Objective	Not an Objective
Runway Lighting	LIRL	MIRL
Taxiway Lighting	LITL	MITL

General Facilities	**Minimum Criteria**	**Desired Criteria**
Rotating Beacon	Yes	Yes
Lighted Wind Indicator	Yes	Yes
Weather Reporting	Not an Objective	AWOS/ASOS
Hangared Aircraft Storage	75% of Based Aircraft	100% of Based Aircraft
Apron Parking/Storage	30% of Daily Transient	50% of Daily Transient
Terminal Building	Not an Objective	Small Meeting Area
Auto Parking	Minimal	Minimal
Fencing	Not an Objective	Terminal Area
Cargo	Not an Objective	Not an Objective
Deicing Facility	Not an Objective	Not an Objective

Services	**Minimum Criteria**	**Desired Criteria**
Fuel	100 LL	100 LL & Jet A
FBO	Not an Objective	Limited
Ground Transportation	Not an Objective	Courtesy Car/Offsite Rental Car
Food Service	Not an Objective	Vending
Restrooms	Yes	Yes
Pilot Lounge	Not an Objective	Yes w/ Weather Reporting Station
Snow Removal	Yes	Yes
Telephone	Not an Objective	Yes

Category V – RAES (Remote Access/Emergency Services)
These airports support primarily single-engine general aviation aircraft, special use aviation activities, access to remote areas, or provide emergency service access.

Performance criteria were evaluated by analyzing each airport's primary runway. A complete description of airport facilities is located below.

Airside Facilities	**Minimum Criteria**	**Desired Criteria**
FAA - ARC	A-I	B-I
NPIAS	Not an Objective	Not an Objective
Based Aircraft	Not an Objective	Not an Objective
Runway Orientation	Varies by Airport	Varies by Airport
Runway Length	2,500 feet Turf	3,000 feet Paved; 2,500 feet Turf
Runway Width	60 feet Turf	60 feet Paved; 120 feet Turf
Runway Pavement Type	Turf, Gravel	Bituminous, Concrete
Runway Pavement Strength	Varies by Airport	Varies by Airport
Runway Pavement PCI	Varies by Airport	Varies by Airport
Taxiways	Not an Objective	Exits Needed to an apron
Approach Type	Visual	NPIA
Visual Approach Aids	Not an Objective	One Runway End
Instrument Approach Aids	Not an Objective	One Runway End
Runway Lighting	Not an Objective	LIRL
Taxiway Lighting	Not an Objective	LITL

General Facilities	**Minimum Criteria**	**Desired Criteria**
Rotating Beacon	Not an Objective	Yes
Lighted Wind Indicator	Not an Objective	Yes
Weather Reporting	Not an Objective	AWOS/ASOS
Hangared Aircraft Storage	Not an Objective	75% of Based Aircraft
Apron Parking/Storage	Not an Objective	100 X 100 foot Apron
Terminal Building	Not an Objective	Small Meeting Area
Auto Parking	Not an Objective	Minimal
Fencing	Not an Objective	Limited
Cargo	Not an Objective	Not an Objective
Deicing Facility	Not an Objective	Not an Objective

Services	**Minimum Criteria**	**Desired Criteria**
Fuel	Not an Objective	100 LL
FBO	Not an Objective	Not an Objective
Ground Transportation	Not an Objective	On-Call Service
Food Service	Not an Objective	Not an Objective
Restrooms	Not an Objective	Yes
Pilot Lounge	Not an Objective	Yes
Snow Removal	Not an Objective	Yes
Telephone	Not an Objective	Yes

Table 2.2 *OAP 2007* Recommended Airport Classification

Category I – Commercial Service Airports
Eastern Oregon Regional Airport at Pendleton
Eugene Airport - Mahlon Sweet Field
Klamath Falls International Airport
Portland International Airport
Redmond Municipal Airport - Roberts Field
Rogue Valley International - Medford Airport
Salem McNary Field
Southwest Oregon Regional Airport

Category II – Urban General Aviation Airports
Astoria Regional Airport
Aurora State Airport
Bend Municipal Airport
Corvallis Municipal Airport
McMinnville Municipal Airport
Newport Municipal Airport
Portland Downtown Heliport
Portland - Hillsboro Airport
Portland - Troutdale Airport
Scappoose Industrial Airpark

Category III – Regional General Aviation Airports
Ashland Municipal Airport - Sumner Parker Field
Baker City Municipal Airport
Bandon State Airport
Burns Municipal Airport
Columbia Gorge Regional - The Dalles
Grant County Regional Airport
Grants Pass Airport
Hermiston Municipal Airport
La Grande / Union County Airport
Lake County Airport
Ontario Municipal Airport
Roseburg Regional Airport
Tillamook Airport

Category IV – Local General Aviation Airports
Albany Municipal Airport
Boardman Airport
Brookings Airport
Chehalem Airpark
Christmas Valley Airport
Condon State Airport - Pauling Field
Cottage Grove State Airport - Jim Wright Field
Creswell Hobby Field Airport
Florence Municipal Airport
Gold Beach Municipal Airport
Illinois Valley Airport
Independence State Airport
Joseph State Airport
Ken Jernstedt Airfield
Lebanon State Airport
Lenhardt Airpark

Category IV – (Continued)
Lexington Airport
Madras/City-County Airport
Myrtle Creek Municipal Airport
Portland - Mulino Airport
Prineville Airport
Seaside Municipal Airport
Siletz Bay State Airport
Sisters Eagle Air Airport
Sportsman Airpark
Sunriver Airport
Wasco State Airport

Category V – Remote Access/Emergency Service Airports
Alkali Lake State
Arlington Municipal
Beaver Marsh
Cape Blanco State Airport
Cascade Locks State Airport
Chiloquin State Airport
Country Squire Airpark
Crescent Lake State Airport
Davis Field
Enterprise Municipal
George Felt
Lake Billy Chinook
Lake Woahink Seaplane Base - *Closed*
Lakeside State Airport
Malin
McDermitt State Airport
McKenzie Bridge State
Memaloose (USFS)
Miller Memorial Airpark
Monument Municipal
Nehalem Bay State Airport
Oakridge State
Owyhee Reservoir State
Pacific City State Airport
Paisley
Pinehurst State Airport
Powers Hayes Field
Prospect State Airport
Rome State
Sandy River
Santiam Junction State
Silver Lake Strip (USFS)
Skyport Airport
Stark's Twin Oaks Airpark
Toketee State
Toledo State Airport
Valley View
Vernonia Municipal Airport
Wakonda Beach State

Source: Mead & Hunt, Inc.

2.5 Summary

Each of these study efforts will provide valuable information to the state as well as the individual airports as stand-alone documents. Combined together, these studies provide a comprehensive resource for airport development throughout the entire state.

Chapter 3

As outlined in the Federal Aviation Administration (FAA) Advisory Circular 150/5070-7, *The Airport System Planning Process*, the process of system planning for aviation is based upon the collection and evaluation of information about each airport within the overall system and the area they serve. The inventory task is accomplished through physical inspection of the facilities, field interviews and surveys, telephone conversations, and review of previous studies.

The objective of the inventory task is to document existing conditions, thereby providing the background information essential to the development and recommendations for the *Oregon Aviation Plan 2007 (OAP 2007)*. The inventory information covers a broad spectrum and includes information on the following elements of the Airport:

- Airside and landside facilities and their uses
- Navigational aids
- Auxiliary support facilities and services
- Environmental observations
- Air traffic activity data
- Survey analyses

A large volume of data was collected, reviewed, and analyzed during the inventory effort. This chapter presents an overall summary of this information and is organized in the following sections:

3.1 General Airport Description and Location
3.2 Existing Airport Facilities
3.3 Current and Forecast Demand
3.4 Survey Responses

3.1 General Airport Description and Location

Aurora State Airport is located approximately one mile northwest of the city of Aurora, within Marion County (**Figure 3.1**). Regionally, the Airport is located approximately 25 miles south of Portland, 25 miles north of Salem, and 90 miles north of Eugene. The airport has easy access to Interstate Highway 5, which is the critical North/South ground transportation link through the Willamette Valley.

According to the State of Oregon Office of Economic Analysis, Marion County contained 305,265 residents in 2005, up 7.2 percent from 284,834 in 2000. Oregon has grown from 3,436,750 residents in 2000 to 3,618,200 residents in 2005, up 5.3 percent. This indicates that Marion County is growing at a faster pace than the state as a whole.

Figure 3.1
Marion County Location Map



The Airport is owned and operated by the Oregon Department of Aviation and is included in the National Plan of Integrated Airport Systems (NPIAS), making this airport eligible for federal funding. Aurora State Airport, designated by the airport code UAO, occupies approximately 144 acres of land.

Historical Development. The Aurora State Airport was constructed by the Oregon State Highway Department during wartime in 1943 as an emergency airfield for air carrier aircraft. The Airport has evolved into the busiest state-owned airport and the fifth overall busiest airport in the state.

3.2 Existing Airport Facilities

Existing airport facilities are presented in three categories: airside, landside, and support facilities. The airside facilities include such areas as the runways, taxiways, aprons, aircraft parking and storage areas, airfield lighting, and navigational aids. The landside facilities include items such as the airport terminal building, vehicular access, auto parking, and support facilities. The support facilities may include fuel facilities, aircraft rescue and firefighting (ARFF) facilities, airport maintenance, snow removal equipment (SRE) and facilities, and utilities. The existing airside, landside, and support facilities are detailed below.

3.2.a Airside Facilities

The airfield consists of many components that are required to accommodate safe aircraft operations. This consists of runways, taxiways, and an apron network; the visual and electronic navigational aids associated with runways; runway protection zones; and general aviation facilities.

Runways. Aurora State Airport has a single paved runway, Runway 17-35. The runway is 5,004 feet long and 100 feet wide with an asphalt surface. The Airport currently has an Airport Reference Code (ARC) of B-II. Additional runway information such as pavement strength and condition are located in **Section 4.2**, *Definition of Airport System Role*.

Taxiways. The existing taxiway system at the Airport consists of a full-length parallel taxiway and entrance/exit taxiways.

Aprons. There are three aprons used for aircraft parking. The north terminal apron has approximately 12 small aircraft tie down spaces. The central terminal apron has 38 small tie-down spaces and four large aircraft parking positions. The southern terminal apron has approximately 10 small aircraft tie-down spaces and five large aircraft parking positions. All three aprons are constructed of asphalt.

Lighting and Navigational Aids. The Airport's lighting and navigational systems extend the Airport's usefulness into night and/or poor visibility.

Pavement edge lighting consists of light fixtures located near the edge of the runway/taxiway to define the lateral limits of the pavement. This lighting is essential for the safe and efficient movement of aircraft during periods of darkness or poor visibility. Runway 17-35 is equipped with medium intensity runway lighting (MIRL). Taxiways at the Airport are equipped with reflectors.

A four-light visual approach slope indicator (VASI) is installed both ends of Runway 17-35. A VASI system provides the pilot with a red, red/white, or white signal that indicates if the pilot is below, above, or on the glide path to the runway.

The ominidirectional approach lighting system (ODALS) is the minimum approach lighting system necessary to achieve three-quarters of a mile non-precision approaches. It consists of seven omnidirectional flashing lights located in the approach area of a non-precision runway. ODALS are installed on the approach end of Runway 17.

A Localizer approach is an Instrument Landing System (ILS) approach without the glide slope. Because there is no glide slope information provided, the Localizer approach is considered a non-precision approach. The Localizer signal provides azimuth, or lateral, information to guide the aircraft to the centerline of the runway. It is similar to a VOR signal except that it provides radial information for only a single course, the runway heading. The Airport has a Localizer approach to Runway 17.

GPS uses satellites placed in orbit around the earth to transmit electronic signals, which properly equipped aircraft use to determine altitude, speed, and position information. GPS allows pilots to navigate to any airport in the country, and they are not required to navigate using a specific navigational facility. The Airport has GPS approaches to both runway ends.

In addition to lighting and navigational aids, the Airport is also equipped with an automated surface observation system (ASOS). The ASOS provides automated aviation weather observations 24-hours a day. The system updates weather observations every minute, continually reporting significant weather changes as they occur. The ASOS system reports cloud

ceiling, visibility, temperature, dew point, wind direction, wind speed, altimeter setting, and density altitude (airfield elevation corrected for temperature).

3.2.b Landside Facilities

General Aviation Facilities. General aviation services at the Airport are provided by three fixed based operators (FBO); Aurora Aviation, General Aviation Services, and Willamette Aviation LLC. They offer aviation fuel, aircraft parking (ramp or tie-down), flight training, aircraft rental, aircraft maintenance, pilot supplies, catering, off site rental cars, and courtesy transportation.

Hangar space at the Airport is comprised of both corporate and T-Hangars. There are approximately 275 hangar facilities at the Airport. Additionally, there is considerable adjacent private development activity that is enhancing hangar facilities and drawing more Aurora based aircraft.

The majority of the landside developments at Aurora State Airport are privately owned and operated and located off airport property. Through the fence operations at the airport are discussed in detail in *Section 4.1.b General Observations and Recommendations*.

3.2.c Support Facilities

Parking. Vehicle parking is located next to each of the FBO buildings. There are moderate parking facilities at the Airport.

Fuel Facilities. All aircraft fuel storage facilities at the Airport are privately owned and operated. The FBOs provide both 100 LL and Jet A fuel.

Aurora State Airport



Source: 2003 Oregon Airport Directory

3.3 Current and Forecast Demand

This element of the report provides projections of future aviation demand at the Airport. Projections of short-, intermediate-, and long-term activity at the Airport are based on 5-, 10-, and 20-year milestones, using 2005 as the base year of analysis as it is the most recent year for which a full year of activity data is currently available.

Projections of aviation demand are an important element of the system planning process as they provide the basis for several key analyses, including:

- Determining the role of the Airport with respect to the type of aircraft to be accommodated in the future
- Evaluating the capacity of existing airport facilities and their ability to accommodate projected aviation demand
- Estimating the extent of airside and landside improvements required in future years to accommodate projected demand

This analysis uses the most recent aircraft activity available to project future levels of aviation demand through the year 2025. The forecast analysis contained in this section includes methodologies based on historical aviation trends at the Airport, as well as other socioeconomic trends related to the state of Oregon. National projections of aviation activity developed by the FAA were also reviewed within the context of this forecast analysis, where available.

This section provides discussions of the methodologies and findings used for projecting passenger enplanements, aircraft operations, and based aircraft at the Airport. The projections of aviation demand are documented below in **Table 3.1**.

3.3.a Forecasting Approach

There are a number of different forecasting techniques available for use in the projection of aviation activity, ranging from subjective judgment to sophisticated mathematical modeling. Because a large number of variables affect a facility plan, it is important that each variable be considered in the context of its use in the plan. For variables that significantly affect the nature and extent of facilities, redundancy has been achieved through the utilization of several forecasting techniques to minimize the uncertainty associated with the range of the forecast variable.

The analysis includes the assessment of historical trends on aviation activity data at the local, regional, and national level. Aviation activity statistics on such items as passenger enplanements, aircraft operations, and based aircraft are collected, reviewed, and analyzed. Similarly, socioeconomic factors such as population and income are analyzed for the effect they may have on aviation growth. The comparison of relationships among these various indicators provides the initial step in the development of realistic forecasts of aviation demand.

The following general methodologies were used in projecting various components of aviation demand at the Airport.

Time Series Methodology. Historical trend lines and linear extrapolation are some of the most widely used methods for forecasting. These techniques utilize time-series types of data and are most useful for a pattern of demand that demonstrates a historical relationship with time. In utilizing this technique, an assumption is made that the same factors that have influenced demand will continue to affect future demand. While this is a rather broad assumption, it often provides a reliable benchmark for comparing the results of other analyses. Linear extrapolation established a linear trend by fitting a straight line using the least squares method to known historical data. Historic trend lines, as utilized in these analyses, examine historic compounded annual growth rates and extrapolate future data values by assuming a similar compounded annual growth rate in the future.

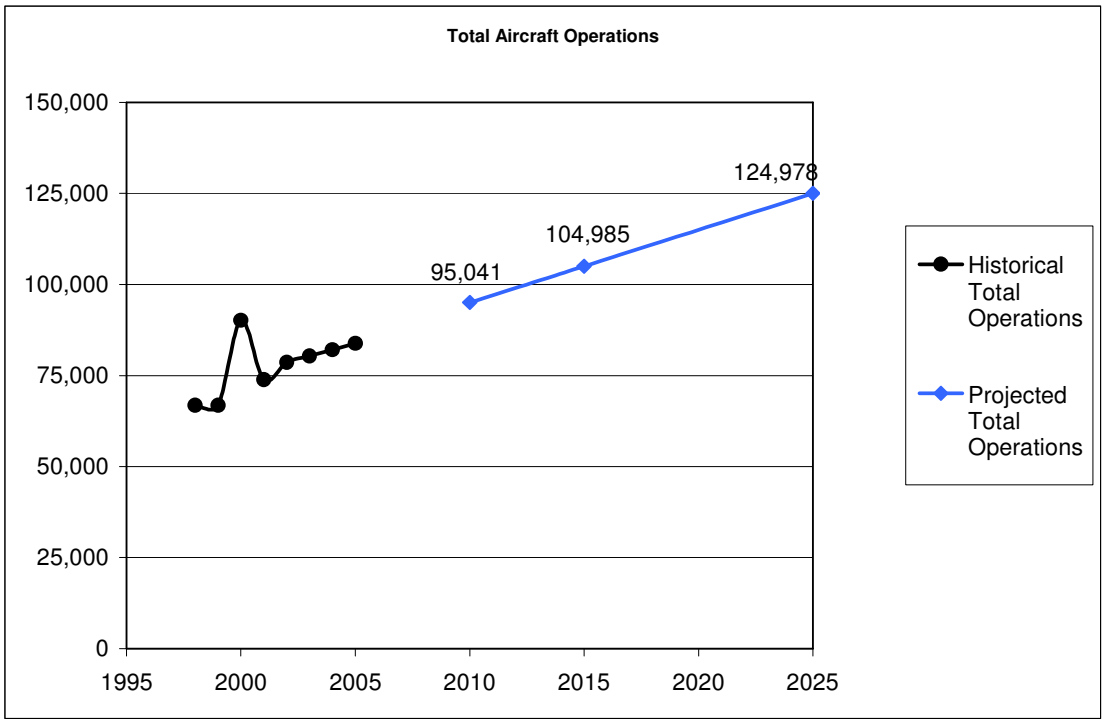
Market Share Methodology. Market share, ratio, or top-down models are utilized to scale large-scale aviation activity down to a local level. Inherent to the use of such a method is the demonstration that the proportion of the large-scale activity that can be assigned to the local level is a regular and predictable quantity. This method has been used extensively in the aviation industry for aviation demand forecasting at the local level. Its most common use is in the determination of the share of total national traffic activity that will be captured by a particular region or airport. Historical data is examined to determine the ration of local airport traffic to total national traffic. From outside data sources, in this case the FAA, projected levels of national activity are determined and then proportioned to the Airport based upon the observed and projected trends.

Socioeconomic Methodology. Socioeconomic or correlation analysis examines the direct relationship between two or more sets of historical data. In this case, socioeconomic analyses have been performed, relating historical aviation activity to historical population levels within the Airport region. Based upon the observed and projected correlation between historical aviation activity and the socioeconomic data sets, future aviation activity projections are developed based upon the projected socioeconomic data sets. In this case, projected population levels were obtained from Woods & Poole Economics, Inc. (W&P), an independent firm that specializes in long-term economic and demographic projections. This forecasting methodology is subject to how accurately an airport's activity reflects local demographic makeup.

Table 3.1 Summary of Aviation Projections

Aurora State Airport (UAO)

Year	Operations				Based Aircraft
	Commercial Air Carrier	General Aviation	Military	Total	
Historical:					
1995					
1996					
1997					
1998	8,791	57,850	180	66,821	233
1999	8,791	57,850	180	66,821	233
2000	9,000	81,000	180	90,180	265
2001	6,190	67,455	250	73,895	387
2002	9,227	69,115	250	78,592	387
2003	9,325	70,775	250	80,350	391
2004	9,422	72,396	250	82,068	387
2005	9,520	74,054	250	83,824	387
Projected:					
2010	10,077	84,713	250	95,041	422
2015	10,668	94,067	250	104,985	447
2025	11,953	112,774	250	124,978	498
CAGR (2005-2025)	*0.00%*	*2.13%*	*0.00%*	*2.02%*	*1.27%*



Source: Historical Enplanements, Operations - FAA Terminal Area Forecast System (TAF)
Historical Based Aircraft - FAA Terminal Area Forecast System (TAF)
Projections - Mead & Hunt, Inc.

3.4 Survey Responses

As previously discussed, surveys were a critical part of the data collection effort. Below is a summary of the surveys and staff interviews that provide the context that surrounds the *OAP 2007*. Surveys were sent to state, local, and county government officials, businesses, airport managers, pilots, chamber of commerce members, and host communities to solicit input of the state aviation system from diverse interests groups.

3.4.a Community Information

Currently, agriculture, timber, and manufacturing were noted as the primary industries in the Aurora area. Survey respondents indicate that the Airport is perceived to be a valuable economic asset to the community. The respondents also indicated that if there were no longer an airport available to the public, they would use the next closest airport. Survey results identified noise, security, safety, and expansion of the Airport as the main concerns regarding the future development of the Airport.

3.4.b Economic Development

The importance of aviation for growth from an economic perspective is ranked moderately high. The survey respondents noted that airport upgrades would increase economic growth for the surrounding communities. According to the survey results, the single most important item that the Airport could do to promote economic growth is to increase runway length. In addition, it was perceived that the impact to the economy would be negative if the Airport was no longer available. Businesses would depreciate in size, relocate, or use the next closest airport. Respondents were unsure if the city of Aurora and Marion County would be supportive of a funding mechanism to finance future airport developments.

3.4.c Airport Development and Use

Survey respondents indicate that the airport users of Aurora State Airport are local business, recreation, tourism, out-of-town business, and agriculture. Surrounding communities rely on the Airport for medical rescue flights and fire protection.

Survey respondents highlighted three areas of concern regarding the Airport. These concerns are outline below:

- There are perceived operational limitations of runway length, terminal amenities, navigational aids, taxiways, aircraft parking/storage, and availability of fuel
- Inclement weather significantly reduces the “usability” of the Airport
- Lack of infrastructure (sewer and water) was noted as a concern to the future of the Airport

3.4.d Air Shuttle

Upon the request of ODA, Mead & Hunt is investigating the feasibility of a state operated and subsidized air shuttle service. This air shuttle service would link various communities within the state. Traditionally, air shuttle services do not compete with regular commercial service, their intent is to commute between smaller local communities instead of large regional airports, therefore, they are viewed as a supplement to air service for airports.

Survey Respondents indicate that some form of an air shuttle service would be considered a convenience and would likely promote economic growth for communities. Survey results indicate that the primary users of the shuttle would be business, emergency services, and health services, transportation of cargo, higher education, and governmental services. Survey results provided the order of importance of issues for potential shuttle passengers. Most important to travelers was schedule, followed by cost, reliability, type of aircraft, and comfort. Survey results identified Bend, Eugene, and Portland as the destination cities for shuttle service originating in Aurora with service being provided daily. Survey results also indicate that the city of Aurora and Marion County would be willing to "guarantee" seats for their community on the air shuttle service; however, they would expect users to pay between $151 and $200 per seat, with a potential of over 20 users per flight.

3.5 Summary

Providing a comprehensive summary of the existing airport facility is an essential part of the planning process. The information contained in this chapter provides the foundation for the recommendations found in *Chapter Four*.

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Chapter 4

As discussed, the inventory and forecasts provide a basis from which recommendations can be made for future development. The recommendations illustrated within the *Oregon Aviation Plan 2007 (OAP 2007)* reflect the Oregon Department of Aviation's (ODA) desire to create a comprehensive aviation system that adequately services the aviation needs of the state and the various interest groups associated with this resource. This chapter is organized in the following sections:

4.1 Airport Facility and Service Needs
4.2 Definition of Airport System Role
4.3 Economic Impact Analysis

4.1 Airport Facility and Service Needs

A primary focus of this report is to identify and evaluate airside, landside, and other general facility needs and deficiencies at the Airport utilizing information collected through the physical inspection of the facility, field interviews and surveys, telephone conversations, review of previous studies, and review of appropriate airport records. The following section presents the recommended airport facility and service needs identified during the study process.

4.1.a Recommendations Based on Performance Criteria

The Aurora State Airport has been classified as a *Category II – Urban General Aviation* airport and should provide appropriate facilities and services commensurate with its system role. The existing airport facilities were compared to the minimum and desired criteria for a *Category II* airport, which identified the following airport facility and service needs:

- Increase Airport Reference Code from B-II to C-II (associated safety area improvements)
- Correct parallel taxiway / runway centerline separation
- Install Medium Intensity Taxiway Lighting (MITL)
- Construct designated cargo apron

4.1.b General Observations and Recommendations

The Aurora State Airport is one of the busiest general aviation airports in the state. A vast majority of the traffic at the Airport is conducted by corporate jets and due to its prime location between the Portland Metropolitan area and Salem, the state capital; the Airport will continue to attract business/corporate aircraft. Therefore, it should be made a priority to increase the margin of safety by developing the Airport with C category aircraft design standards.

The majority of the landside developments at Aurora State Airport are privately owned and operated. However, some areas of the airfield are owned by the state of Oregon and leased to private business. The businesses that are located off airport property are entering the airfield from private property, more commonly known as a "through the fence" operations.

Through the fence agreements provide access onto the airfield for off-airport businesses or individuals who utilize the airport infrastructure but do not lease space at the airport or contribute financially to support the airport through ground leases or operational leases like those located on airport property.

General aviation airports often have difficulty generating revenue to offset the costs of operating, maintaining, and improving the airport. An important revenue generator at many airports is the lease of airport property for private or commercial use. Private property owners adjacent to an airport that are granted access to the airport infrastructure are typically not contributing to the airport fund through the normal lease process. This often results in an economically competitive advantage to off-airport businesses. They are allowed to access the airport without paying a lease rate which often reduces their overhead, allowing them to charge lower rates than their on-airport counterparts. This creates a situation which is first and foremost noncompliant with FAA policies but more importantly, often results in a weaker airport economy.

The FAA does not have a formal policy against "through the fence" operations; however they do strongly discourage their use. To maintain an economically viable business environment the airport sponsor should require all off field businesses or individuals to compensate the sponsor similarly to those being paid by on airport tenants. A yearly fee, percentage of gross profits, or access fees are common methods of collecting compensation from off airport businesses or individuals.

ODA is currently discussing Senate Bill 680 to address the "through the fence" operations at Aurora State Airport.

4.1.c Airport Capital Improvement Program

The Airport Capital Improvement Program (ACIP) is the primary planning tool the FAA utilizes to identify, prioritize, and assign funds to capital airport development and associated capital needs for all NPIAS airports. The 2006 ACIP for Aurora State Airport includes the following projects:

- Construct taxiway Phase 06 and 07
- Relocate taxiway including purchasing land
- Update Exhibit A Property Plan
- Update airport layout plan
- Implement Phase 2 – land purchase

4.1.d Other Potential Improvements for Consideration

No other airport improvement projects were being considered at the time of publication.

4.2 Definition of Airport System Role

Category II – Urban General Aviation
These airports support all general aviation aircraft and accommodate corporate aviation activity, including business jets, helicopters, and other general aviation activity. These airports' primary users are business related and service a large geographic region or they experience high levels of general aviation activity.

Performance criteria were evaluated by analyzing each airport's primary runway. A complete description of airport facilities is located in **Section 3.2**, *Existing Airport Facilities*.

Airside Facilities	**Existing Facilities**	**Minimum Criteria**	**Desired Criteria**
FAA - ARC	B-II	C-II	Varies
NPIAS	Yes	Yes	Yes
Based Aircraft	397	Not an Objective	Not an Objective
Runway Orientation	17/35	Not an Objective	Not an Objective
Runway Length	5,004 feet	5,000 feet	Varies by Aircraft
Runway Width	100 feet	100 feet	Varies by Aircraft
Runway Pavement Type	Bituminous	Bituminous, Concrete	Bituminous, Concrete
Runway Strength	30,000 (SW)	Not an Objective	Not an Objective
Runway Pavement PCI	84	Not an Objective	Not an Objective
Taxiways	Full Parallel	Full Parallel	Full Parallel/High Speed Exit
Approach Type	Non - Precision	Precision	Precision
Visual Approach Aids	V4R (17) V4L (35)	One Runway End	Both Runway Ends
Instrument Approach Aids	ODALS, LOC (17) GPS (17/35)	Not an Objective	One Runway End
Runway Lighting	MIRL	MIRL/HIRL	MIRL/HIRL
Taxiway Lighting	Reflectors	MITL/HITL	MITL/HITL

General Facilities	**Existing Facilities**	**Minimum Criteria**	**Desired Criteria**
Rotating Beacon	Yes	Yes	Yes
Lighted Wind Indicator	Yes	Yes	Yes
Weather Reporting	ASOS	AWOS/ASOS	AWOS/ASOS
Hangared Aircraft Storage	275	75% of Based Aircraft	100% of Based Aircraft
Apron Parking/Storage	70	75% of Daily Transient	100% of Daily Transient
Terminal Building	Yes	Yes	Yes
Auto Parking	Moderate	Moderate	Adequate
Fencing	Perimeter	Perimeter	Perimeter
Cargo	Non-Designated Apron	Designated Apron Area	Small Handling Facility w/ Apron
Deicing Facility	No	Not an Objective	Yes

Services	**Existing Facilities**	**Minimum Criteria**	**Desired Criteria**
Fuel	100 LL & Jet A	100 LL & Jet A	100 LL & Jet A, 24-hour service
FBO	Full Service (3)	Full Service	Full Service, 24-hour service
Ground Transportation	Rental Car, Taxi	Offsite Rental Car, Taxi	Rental Car, Taxi, or Other
Food Service	Vending, Coffee Shop	Vending	Coffee Shop/Deli & Cold Foods
Restrooms	Yes	Yes	Yes
Pilot Lounge	Yes w/Weather Reporting	Yes w/ Weather Reporting	Yes w/ Weather Reporting
Snow Removal	Yes	Yes	Yes
Telephone	Yes	Yes	Yes

4.3 Economic Impact Analysis

The economic impact analysis of airports in Oregon was developed for each airport, measuring economic impacts of airport facilities, within regions and throughout the state. Airports that are part of the Port of Portland were not part of this study, except for the regional-based analysis of aviation dependent businesses. This study used the five regions of *ConnectOregon* to measure local/regional economic impacts of airports and for dependent non-aviation businesses. The regions are shown by the accompanying map.

Total economic impacts are the sum of on-airport economic activities, off-airport spending by visitors who arrive by air, and spin-off impacts (multiplier effect). Airport impacts are provided by region and state to show the contribution of each airport to the regional and state economies. In addition, aviation dependent impacts are provided by region to show the importance of airports in each region to non-aviation businesses. All impacts reported represent a base year of 2005. Each type of impact is defined in the following paragraphs.

On-Airport direct impacts represent economic activities that occur on airport grounds. By separating aviation related activities from non-aviation activities, The *OAP 2007* illustrates the regional economic contribution of aviation by airport in the regional and state economies, as well as the overall impact of each airport as a facility. Aviation related activities are those that would not occur without the airport, such as airlines, fixed base operators (FBO), government, and other tenants located at the airport or directly dependent on the airport. This category also includes airport management and other individuals employed directly by the airport, as well as retail and service operations for passengers, pilots, and other airport employees. In some cases, airports provide land or building space for companies that are not affiliated with aviation. These tenants are not related to the aviation mission of the airport, but are using the facility as a convenient and affordable business or industrial parks.

Off-Airport visitor spending (Direct Impacts) are expenditures made by air travelers who are visiting from outside the region, and occurs off the airport-in the regional economy. Visitor spending includes lodging, food, entertainment, retail purchases and ground transportation (retail purchases and on-airport car rentals are captured by on-airport impacts). Visitor spending is analyzed for commercial passengers as well as for general aviation pilots and passengers. Visitors flying into Oregon from another state or nation contribute to the airport's regional economy as well as to the state. However, passengers flying within Oregon, from one region to another, contribute to the region of their destination airport, but are not bringing additional money into Oregon. Therefore, in regions with air carrier airports, the direct impact of visitor spending for the region is higher than the impact of visitor spending for the state.

Airport dependent impacts represent area businesses that are dependent on an airport for incoming and outgoing, and for business travel. These businesses may relocate or suffer substantial loss if the airport were not available. This impact is not included in traditional economic impact methodology and is analyzed and reported by region for this study. Thus the

economic dependence of a region on aviation represents the cumulative impacts of all airports within a region. The analysis is provided as an indicator of the importance of airports to regional economies.

Spin-off impacts (Multiplier Affect) are calculated using impact multipliers, which are used to reflect the recycling of dollars through both the regional and state economy. A dollar spent in the economy does not disappear; rather, it continues to move through the local economy in successive rounds until it is incrementally exported from the community. As the expenditures described above are released into the economy, they circulate among other industry sectors, creating successive waves of additional economic benefit in the form of jobs, payroll, and output (expenditures). These successive rounds of spending are known as spin-off impacts, and help to represent the full impact of each dollar spent in a region. An example would be an airport employee spending his or her salary for housing, food, and other services. Spending occurring outside the area is considered economic leakage and is not reflected in the multiplier. Spin-off impacts are often reported as indirect and induced impacts. Indirect impacts reflect the purchase of goods and services by businesses. Induced impacts reflect worker making consumer purchases.

The project team analyzed the economic contributions of 91 airports under the jurisdiction of the Oregon Department of Aviation (ODA). In addition, the Port of Portland commissioned a separate economic impact studies of Portland International Airport, Portland Hillsboro Airport and Portland Troutdale Airport, which are administered by the Port. The sum of economic impacts derived from the OAP 2007 and the Port of Portland studies account for economic impacts generated by all public use airports in Oregon.

4.3.a Contribution of Airports to the Economy of Oregon

As shown in **Table 4.1**, Oregon public-use airports contributed a total economic impact of $8.3 billion to the state economy, including $3 billion from ODA airports and more than $5 billion from Port of Portland airports. Following Table 4.1 is a summary entitled *Airport Role in Economy*, which illustrates the individual airport economic impact.

Additional study highlights include:

- Oregon ODA public-use airports, including airport tenants, directly employ 7,000 people for aviation related activities and expend $259 million in wages
- Oregon ODA public-use airport employees and tenants earned an average annual salary of $36,000 per year for aviation activities and $35,000 per worker, when including non-aviation jobs
- Off-airport visitor industry employees earn an average annual salary of $15,000 per year

Table 4.1 Economic Contribution of Airports to the Oregon Economy

	Jobs	Wages	Business Sales
Direct Effects of ODA On-Airport Aviation Activities and Visitor Spending			
On-Airport, including FBO & air related tenants	7,273	$262,147,000	$827,475,000
Off-Airport: visitor spending	6,762	$101,641,000	$324,097,000
Subtotal of Direct Effects From ODA Airports	14,035	$363,788,000	$1,151,572,000
ODA Spin-off Effects of Supplier and Income Re-spending			
Due to On-Airport Aviation	12,029	$305,851,000	$883,988,000
Due to Visitor Spending	3,558	$94,459,000	$310,756,000
Subtotal of Spin-off Effects	15,587	$400,310,000	$1,194,744,000
Total ODA Airport Aviation Related Impacts	29,621	$764,098,000	$2,346,316,000
ODA Airport Generated Impacts of Non-Aviation Activities			
On Airport Non-Aviation Activities	2,177	$67,294,000	$320,530,000
Spin-offs due to Non-Aviation Activities	3,374	$96,239,000	$332,084,000
Total ODA Airport Non-Aviation Impacts	5,551	$163,533,000	$652,614,000
ODA Airports Total Aviation and Non-Aviation Related	35,172	$927,631,000	$2,998,930,000
Port of Portland Totals*			
Airport Generated	20,005	$941,244,000	$3,533,456,000
Visitor Generated	39,418	$907,718,000	$1,740,344,000
Total Impact Port of Portland Airports	59,423	$1,848,862,000	$5,273,800,000
Grand Total – All Airports	94,595	$2,776,493,000	$8,272,630,000

Source: Airport and Tenant Surveys, EDR Group and Mead & Hunt Analyses, IMPLAN econometric package.
Note: Numbers may not add due to rounding.
*Port of Portland Airports include Portland International Airport, ,Portland Hillsboro Airport and Portland Troutdale Airport. Data for the Port of Portland airports was provided by the Port.

Oregon Aviation Plan 2007

Version OR 2.1 5/22/07

Airport Role in Economy

Airport: Aurora State
Airport Code: KUAO

County: Marion

Region: Willamette Valley and Coast

Evaluated for Year: 2005

Activity Data

Total Commercial Operations:	0
Total Commercial Emplanements:	0
Total Commercial Visitors:	0
Total GA Operations:	73,895
Total GA Passengers:	221,685
Total GA Visitors:	59,213
Total Military Operations:	0

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On-going Contribution to the Regional and State Economies

	Jobs		Wages		Business Sales	
	Local	**State**	**Local**	**State**	**Local**	**State**
Direct Effects of On Airport Activities and Visitor Spending						
1. On Airport (incl. FBO and air related tenants)	781	781	$22,305,000	$22,305,000	$62,654,000	$62,654,000
2. Off-Airport: Visitor Spending	179	179	$2,659,000	$2,659,000	$8,483,000	$8,483,000
Total Direct	960	960	$24,964,000	$24,964,000	$71,137,000	$71,137,000
Spin-off Effects: Supplier and Income Re-spending						
3. Due to On Airport Aviation	1,288	1,334	$23,432,000	$29,938,000	$50,205,000	$61,293,000
4. Due to Visitor Spending	84	96	$2,166,000	$2,460,000	$6,932,000	$8,232,000
Total Spin-off	1,372	1,430	$25,598,000	$32,398,000	$57,137,000	$69,525,000
Total Airport Aviation Related Impacts	2,332	2,390	$50,562,000	$57,362,000	$128,274,000	$140,662,000
Total Airport Generated Impacts - Not Aviation						
5. On Airport Non-aviation Activities	39	39	$958,000	$958,000	$3,946,000	$3,946,000
6. Spin-offs due to Non-aviation Activities	32	40	$827,000	$1,006,000	$2,607,000	$3,254,000
Total Airport Non-aviation Impacts	71	79	$1,785,000	$1,964,000	$6,553,000	$7,200,000
Total Aviation and Non-aviation Related	2,403	2,469	$52,347,000	$59,326,000	$134,827,000	$147,862,000
Regional Off-Airport Aviation Dependent Business Activity						
7. Direct Business Activity	8,061	8,061	$368,349,000	$368,349,000	$2,142,913,000	$2,142,913,000
8. Spin-offs due to Dependent Activity	14,509	17,423	$425,253,000	$518,828,000	$1,468,166,000	$1,788,387,000
Total Off-airport Aviation Dependent Activity	22,570	25,484	$793,602,000	$887,177,000	$3,611,079,000	$3,931,300,000

Note: Regional Off-airport Aviation Dependent Business Activities account for business activity in the region that rely on aviation for business travel and cargo, and do not reflect a specific airport.

Appendix G:
PAC COMMENTS COMPILATION

Airport Master Plan Update

Aurora State Airport

Aurora State Airport Master Plan Update - Comments Received on Miscellaneous Items

Comment #	Page #		WHPacific Response
Comments on Scope of Work		**Comments received from: Nick Kaiser**	
0.1	3-18, task 1.2	Significant growth doesn't mean that the runway should be extended. There is no mention of a tower.	A runway extension is not assumed, it is just one element to be studied in the Plan.
0.2	5-18, task 2D	Add proximity to Aurora's city limits.	No changes to Scope of Work will be made. Location of Airport, in relation to Aurora, is mentioned in the Plan.
0.3	6-18, task 2F	Need to collect actual data for airport operations and use ODA noise study.	All available data is used in the Plan, as well as information from the noise study.
0.4	6-18, task 2.4	Include city of Aurora land use data (vision for airport and off airport land use). Include Aurora comp plan and county UGB agreement (area of mutual concern).	Scope indicates land use documents from local government will be obtained. This comment is more applicable to Chapter Two, and this information will be supplemented in that chapter at the appropriate location(s).
0.5	7-18, task 3.2	Need to have firm data on projected critical aircraft. Why not have constraints on projected aircraft types? Current actual operations data should be used for airport demand/capacity not estimated operations.	See response to #3.1. All data available at the time of the study has been used to develop the forecasts.
0.6	9-18, task 4.2	Why not look at an airport design that fits within the current constraints of the airport?	The Facility Requirements only outlines infrastructure needed to meet the forecasted demand. The next task - Airport Alternatives - is where the Plan studies the No Build alternative, which would be a design that fits within the airport's current constraints, as well as other possible layouts.
0.7	13-18, task	(land use and noise contour drawing) Look at city zoning boundaries and noise study.	Noted, the City's zoning boundary will be evaluated, as appropriate. Traffic patterns, which at Aurora State are based on the noise study, are always a consideration in developing the noise contours.
0.8	14-18, task 7.2	Who will guarantee the bonds?	The issue of bonds, including if they are appropriate, will be discussed in Chapter Seven as stated in the Scope of Work.
Comments on Meeting Documents		**Comments received from: Nick Kaiser**	
0.9	4-6	Airport operations for 2002-2003 were 62,926 (actual count).	The RENS acoustical counting program reported 62,926 operations for that reporting cycle. However, that number is an estimate, based on seasonal samples. It is not an "actual" count.
0.10	5-6	The last master plan had a notation on the airport layout that evaluated adjacent property.	It stated the area would be acceptable for airport-related development under private ownership.

0.11	6-6	The last master plan was not adopted by the county but the CIP was completed anyway?	Elements of the CIP that were implemented went through the appropriate conditional use approvals with the County, since they were not approved outright through adoption of the Plan.
Meeting #1		**Comments received from: Nick Kaiser**	
0.12	2-7	(parameters) Will not do land use evaluations. If expansion occurs livability concerns from the local community needs to be considered.	If any deficiencies are noted the Plan will consider a variety of issues, including those that impact livability.
0.13	5-7	Aurora airport should not be a reliever airport for PDX.	As stated in Chapter 1, the Airport should continue to fulfill its role as an Urban General Aviation Airport.
General		**Comments received from: Tony Holt and City of Aurora**	
		Tony Holt	
0.14	-	Chapters 1-3 have been written prior to any discussion of a vision, goals and objectives or assumptions with the PAC. This leaves a clear impression that there is an attempt to lead the discussion in a predetermined direction.	There is no predetermined direction for this Plan. Goals and issues were a significant portion of the PAC #1 discussion, as well as the Kick-Off Meeting.
0.15	-	The process is being rushed and there is not sufficient time allocated, nor enthusiasm by the Consultant and ODA, to make sure all questions are answered at PAC meetings, that the PAC fully understands the assumptions being made and knows the sources of the data being used.	This planning process includes six PAC meetings, five open houses, and one kick-off meeting, which allows all interested parties an opportunity to review and comment on the Plan. ODA and WHPacific are attempting to address all questions and comments from the PAC; however, the meetings are designed to be working sessions and some questions must be answered off-line. These questions are being addressed in this spreadsheet and are available to the PAC and public.
0.16	-	There are obvious constraints to development and expansion of this airport (only one runway, bordered by roads on four sides, limited remaining areas for development within the footprint). Yet there is no discussion of constraints.	Chapter Five, *Airport Development Alternatives* , will address these constraints - as well as others.
0.17	-	ODA has already picked a preferred activity level forecast prior to any discussion with the PAC.	ODA's draft preferred forecast was submitted to the PAC and FAA in mid-September. Based on comments received, some changes will be made to the forecast chapter before final publication, but we do not see a need to substantially change the activity levels forecast.
0.18	-	Throughout the document many general statements mention that were collected from individuals or organizations but there is no proper attribution. There should be.	Sources will be added, as appropriate. However, some sources were given a promise of confidentiality, see response to #3.29.
		City of Aurora	
0.19	-	Has ODA hired a planning consultant for this update like in 2000 and if so, who is it?	Yes, ODA has retained WHPacific, Inc. to undertake the Master Plan Update.

0.20	-	Is there an Aviation System Plan adopted by ODA or Marion County as required by OAR 660?	Yes, the Oregon Aviation Plan was published in 2007. Please refer to ODA's website.
0.21	-	Text: Mutually beneficial to city and airport to have services provided by a utility and not under separate properties; the City of Aurora's future industrial and commercial lands will be impacted by expansion of the airport and they have mutually beneficial/reciprocal relationships; reference Aurora Comprehensive Plan goals and policies;	References will be made, as appropriate, within the plan.

Aurora State Airport Master Plan Update - Comments Received on Draft Chapter One

Comment #	Page #	Comments received from: Nick Kaiser, Susie Stevens, Tony Holt, Clackamas County, and City of Aurora	WHPacific Response	Will revisions to Chapter 1 be made based on comment?
		Nick Kaiser		
1.1	1-2	Enhance safety/noise - Need to complete VFR update of preferred traffic patterns.	Noted, this will be added to the paragraph.	Yes
1.2	1-2	Goal 2 - Livability of surrounding communities should also impact future growth of airport.	Livability of surrounding communities is a consideration for both environmental and political feasibility, which is why it wasn't mentioned outright.	No
1.3	1-3	Runway extension would disrupt the area's livability and encourage the growth of bigger and louder aircraft. Airport growth needs constraints so that the surrounding areas are not negatively impacted.	Impacts of any development will be discussed with the PAC when airport development alternatives are presented in Chapter Five.	No
1.4	1-4	Keep runway 35 as the calm wind runway for noise abatement. Instrument approach on 17 needs to have written training guidelines for calm wind use.	Noted. Chapter Four discusses this issue in more detail.	No
1.5	1-5	If the airport is changed from BII to CII will the runway have to be extended?	C-II is a classification for aircraft based on approach speed, tail height and wingspan. It does not relate directly to runway length.	No
1.6	1-6	Airport use from survey - inadequate runway length is an issue for only 8% of the respondents that don't keep their planes at Aurora.	The survey is only used anecdotally; it was not intended to be a representative sample of all airport users. Data on runway usage, in relation to runway length, was aquired by other sources in addition to this survey.	No
1.7	1-11	Chart error - II should be III	Noted, chart will be revised accordingly.	Yes
1.8	1-13	What is length of Salem airport? Troutdale is a reliever airport for PDX and has an ARC of BII. What is its runway length?	As noted in Table 1A, the length of Salem's runway is 5,811 and Troutdale's is 5,399.	No
1.9	1-14	Airport role - conclusions and recommendations. Need 3rd alternative - grow within the current (physical) constraints of the airport.	This alternative will be evaluated in Chapter Five. This recommendation states the airport should continue to fulfull its role as an Urban General Aviation Activity Airport; it makes no reference to expansion.	No
		Susie Stevens		
1.10	1-2	4th bullet - add "and cite sources."	Noted, text will be revised.	Yes
1.11	1-2	Goal 2 - Add physical constraints to feasibility.	Physical constraints are a component of the financial feasibility, environmental feasibility, and political feasibility.	No
1.12	1-2	Note: This paragraph should address physical constraints as well: one runway, adjacent roads, airport footprint, etc.	This will be discussed in Chapters Four and Five.	No
1.13	1-3	1st bullet - Remove "evaluate" and insert "involve."	Noted, text will be revised.	Yes
1.14	1-3	5th bullet - Conduct proper noise study.	A noise study was conducted in 2002 and noise contours will be prepared as part of this Plan. No other noise study will be conducted as part of this project.	No

1.15	1-3	Could the appendices please be included with the next draft chapters or posted to the website?	The appendices were mailed to all PAC members in hard copy form. For future mailings, they will also be posted on the website (note, they were later added). The appendices were not included in the initial PAC emailing, because of their filesize. However, if future appendices have smaller filseizes, they too will be included in the initial PAC emailing.	Yes
1.16	1-3	Please cite the sources for the statements made in this paragraph (runway extension). Include the survey in the appendices.	Copies of the user surveys will be included as an appendix.	Yes
1.17	1-3	Air traffic control tower section: Please cite sources for these comments.	Sources will be added, as appropriate.	Yes
1.18	1-4	1st full paragraph, revise to read "…rural character [, quality of life,] and natural…"	Noted, text will be revised.	Yes
1.19	1-4	Other Airport Improvements section: Most important to have the survey and interview data to make this paragraph credible.	See response to #1.16.	Yes
1.20	1-6	Survey paragraph: Please note that there was no random or other conventional method survey. Who received the survey? Who did not? What was the percent returned of those sent out?	We will clarify the survey was not intended to be a statistical representation of airport users, along with a list of where the survey was distributed. The rate of return is difficult to account for, since the survey was also available online and copies may have been made to those that we distributed; however, we will attempt to quantify a firm number.	Yes
1.21	1-7	2nd paragraph: This number does not appear to tied in with graph on 3-10.	We bought IFR data from 2 different providers. The 14,186 IFR ops for Oct. 2007-Oct. 2009 came from FlightAware. Addresses in that database were easy to sort, which helped to mail surveys & analyze service area. Later, the master plan was put on hold for several months. When the project started up again, we needed more up-to-date data for forecasting. We subscribed to GCR's less expensive Airport IQ Data Center to obtain IFR data used in Chapter 3. In comparing calendar year 2008, FlightAware shows 3,606 arrivals and 3,664 departures, or 7,270 operations. For the same period, GCR information shows 3,226 arrivals and 2,462 departures, or 5,688 operations. Perhaps FlightAware is capturing more of the flight plans filed after departure and those cancelled before landing. We will add a source (FlightAware) to the reference in Chapter 1 & change the estimate of IFR ops at the top of page 3-10 from "5% to 7% of total traffic" to "5% to 10% of total traffic." This does not affect the forecasts summarized on 3-32.	Yes
1.22	1-14	Troutdale airport is in Multnomah County.	Noted, text will be revised.	Yes
		Clackamas County		
1.23	1-2	Last bullet top of page. The PAC requested a vision at the beginning of the process.	Yes, however, the Plan initially did not include a vision statement at all (see PAC #1 summary: "The Plan will not: … develop a vision statement for the Airport.") This was a compromise.	No

1.24	1-2	Goal 2 - 1st sentence. This is not an accurate statement. Not all the PAC members stated this as a concern. Some PAC members share the community's concern.	It is our recollection the PAC members who are airport users expressed this opinion. However, text will be revised to state "Some PAC members who are airport users fear …"	Yes
1.25	1-3	Runway Extension - entire paragraph. This statement is based on 2009 survey? Survey responses should be available on webpage for review.	See response to #1.16.	Yes
1.26	1-3	Air Traffic Control Tower - last sentence. What is meant by "slowed down?"	The FAA and ODA have postponed some critical decision-making points in the ATCT process to include information from the Plan once it becomes available.	No
1.27	1-4	Other Airport Improvements. The survey responses should be available on wepage and to the PAC.	See response to #1.16.	Yes
1.28	1-5	Aurora State Airport's Regional Role. Is the reference to "spin-off" addressing off site businesses the airport serves?	From the 2007 OAP: "Spin-off impacts are calculated using impact multipliers, which are used to reflect the recycling of dollars through both the regional and state economy… Spin-off impacts are often reported as indirect and induced impacts."	No
1.29	1-6	5th paragraph. Implies that there is a possibility that Airport will become a reliever. Is that really the intent here, especially when it is concluded on page 1-15 that commercial service is not an appropriate future role for the Aurora Airport. Consultant clarified reliever airport during meeting - does not include commercial aircraft but does include business aircraft that meets the standards in chapter 1, page 11.	Correct, reliever airports do not provide commercial (airline) service.	No
1.30	1-15	Bullet at top of page. See comment for page 1-6.	See response to #1.29.	No
1.31	1-15 & 1-16	4th paragraph, last paragraph 1-16. What would be the "trigger" to designate the Aurora Airport as a reliever airport, and why Aurora when it was stated above the Salem [airport] is the better choice? What is the process?	The "trigger" points are generally those described in the bullets on pages 1-15 and 1-16. However, each airport is reviewed on a case-by-case basis. Most likely, at Aurora State, the trigger would be if any of the three entities (ODA, Port of Portland, or FAA) initiated an individual review.	No
		Tony Holt		
1.32	1-2	Goal 2 Heading says "as feasible" Several areas of feasibility are listed. However, this section needs to recognize the physical constraints to airport expansion such as one runway, bordered by roads on four sides, limited areas remaining available for development within the footprint, etc.	See responses to #1.11 and 1.12.	No

1.33	1-3	First bullet, change word "evaluate" to properly describe the meaning of this bullet (it is meaningless currently)---including assessing the effect of any proposed changes on the livability of airport neighbors. **Add bullet**-Perform noise study (to measure potential impacts of proposed developments). **Runway Extension paragraph**-- Please provide proper attribution to the many statements loosely made in this paragraph such as 'Some Airport users and businesses favor a runway extension of up to 1,500 feet'—which?. 'Airport neighbors are concerned that a runway extension would unduly disrupt the area and encourage more and louder aircraft' --who stated that? **Air Traffic Control Tower paragraph**—again, need proper attribution for statements made.	See responses to #1.13, 1.14, 1.16, and 1.17. Sources will be added for statements regarding airport neighbors and noise, as well.	Yes
1.34	1-4	2nd para "Airport neighbors are----". **Add to this sentence** 'and their quality of life'. **Calm Wind Runway Change section** Need to explain this move has never lessened the noise over Charbonneau so to revert to 17 is not a major concern. **Other Airport Improvements** for complete transparency, need a list of individuals interviewed and those given survey with an explanation of how they were chosen, either here or in a table.	See responses to #1.18, 1.27, and 3.29. The calm wind runway section will be supplemented.	Yes
1.35	1-5	2nd Section, first sentence. How has Aurora Airport suddenly changed from a **rural** GA airport to an **urban** GA airport? Note: the Oregon 'Through the Fence' Bill only applies to rural airports.	Aurora State has always been defined as an Urban GA Airport, as it lies on the southern extents of the Portland-Vancouver-Beaverton Metropolitan Statistical Area (MSA) and is within the Salem MSA. It was included in SB 680 explicitly as an exception to the rural airport requirement.	No
1.36	1-7	2nd para the **14,186 IFR operations** does not seem to tie to the graph on page 3-10	See response to #1.21.	Yes
1.37	1-14	Page 1-14 6th para-error-**Troutdale is not in Washington County**.	See response to #1.22.	Yes
1.38	14-Jan	Para 7-again refers to Aurora as an urban airport.	See response to #1.35.	No
1.39	1-16	4th para- refers to 79,953 operations at Aurora on a 10 year average. **This calculation needs to be carefully explained to the PAC.**	The footnote on p. 1-16 mistakenly says it is a ten-year average, when in fact 1998-2008 is 11 years. That footnote will be corrected to say 11 instead of ten. Using averages instead of individual years discredit year-to-year fluctuations. 79,953 is the average of the 1998-2008 total operations in Table 3K, p. 3-23.	Yes
1.40	-	--"PAC members who are airport users fear community concerns will unduly constrain growth."	See response to #1.33.	Yes
1.41	-	--"Some airport users report there are times that they must lessen their airplanes weight in order to depart---"	See response to #1.33.	Yes
1.42	-	--"Some Airport users and businesses favor a runway extension of up to 1,500 feet." (but not mentioned in the survey)	See response to #1.33.	Yes
1.43	-	--"Airport neighbors are concerned that a runway extension would unduly disrupt the area and encourage more and louder aircraft."	See response to #1.33.	Yes
1.44	-	--Re changing calm wind runway back to 17, "noise impact would move with traffic, a concern for Airport neighbors."	See response to #1.34.	Yes

1.45	-	One goal is “evaluate all communities and jurisdictions in the Airport’s influence area.” Meaning?	See response to #1.33.	Yes
1.46	-	When did Aurora Airport go from being classified as a Rural General Aviation Airport to an Urban General Aviation Airport.	See response to #1.35.	No
1.47	-	-You want to “determine” Airport’s future role rather than predict it.	There is no predetermined direction for this Plan.	No
1.48	-	-No discussion of possible constraints to growth such as one runway, hemmed in by roads, current zoning, etc.	See responses to #1.11 and 1.12.	No
1.49	-	-No mention of livability of airport neighbors as goal.	See response to #1.2	No
1.50	-	-An MP goal should be to predict demand as accurately as possible.	It is, see bullet #4 on page 1.2.	No
1.51	-	-An MP goal should be to evaluate potential noise and traffic impacts for any new development.	These are included as Goal #3, "Consider all the off-airport impacts of Airport development." Impacts to ground transportation are cited specifically, and noise contours will be developed as part of the Plan.	No
1.52	-	-Should show a list which individuals/organizations responded to the survey?	See response to #1.16.	Yes
1.53	-	-Should show a list of which individuals/organizations were interviewed?	Sources will be added, as appropriate. However, some sources were given a promise of confidentiality, see response to #3.29.	Yes
1.54	-	-How do the Oct 2007 to Oct 2009 IFR numbers on page 1-7 fit with Exhibit 3D, page 3-10?	See response to #1.21.	Yes
1.55	1-16	Says the average operations at Aurora from 1998-2008 were 79,953 operations; how calculated and isn’t this meaningless?	See response to #1.39. Average operations at both Aurora and PDX were used to perform the calculations associated with the reliever designation. Using averages instead of individual years discredit year-to-year fluctuations. The reliever calculations help assess the role of the Airport. In the past, reliever airports received set-aside funding in the Airport Improvement Program (AIP). This is not the case with the current (expired) legislation covering the AIP, although reliever airports receive higher priority than general aviation airports for some discretionary funding, according to the AIP Handbook. Because the authorizing legislation for the FAA has expired and the content of new legislation is unknown, we were hesitant to go into much detail. We will summarize this information and add it to the chapter so that it seems more meaningful.	Yes
		City of Aurora		
1.56	1-2	Goal 3 has good language that needs to be referred to often in other parts of the plan update, “Consider all the off-airport impacts of Airport development; minimize negative impacts and maximize positive impacts”	All goals are used to evaluate the proposed preferred alternative in Chapter 5, and are used in the decision-making process.	No

1.57	1-3	"For example, the lack of sewer service is a major constraint for having a restaurant at the Airport…" Add text: "While Oregon Department of Aviation recognizes the complexities of Oregon's land use system and potential need for upgrades to City of Aurora utilities prior to annexation, ODA is generally supportive of annexation of the Aurora Airport by the City of Aurora due to the economic growth potential for the airport if it were connected to city services".	Noted, text will be revised.	Yes
1.58	1-12	Page 1-12 under Aurora State Airport heading, add text: "Located less than a quarter mile from the City of Aurora"	See response to #2.1.	Yes

Aurora State Airport Master Plan Update - Comments Received on Draft Chapter Two

Comment #	Page #	Comments received from: Nick Kaiser, Susie Stevens, Tony Holt, Clackamas County, and City of Aurora	WHPacific Response	Will revisions to Chapter 2 be made based on comment?
		Nick Kaiser		
2.1	2-1	Airport location - correction - airport is 1/3 mile from the city limits.	Noted, text will be revised.	Yes
2.2	2-7	Airspace - Need written guidelines for IFR on 17 when calm wind runway 35 is used during VFR conditions.	Chapter Two reports existing conditions. ODA is working with FAA to create procedures to reduce the noise impact to surrounding communities.	No
2.3	2-8	Use noise study	A detailed discussion of the noise study is in Chapter Four.	No
2.4	2-8	Land use - Airport is public Zone - If airport becomes an airport zone what changes other than outright uses will be allowed?	No other changes would occur.	No
2.5	2-9	RPZ - How will this change with runway extension?	Chapter Five discusses alternative Airport Layouts, along with design standards.	No
2.6	2-9	Human factors - consultants indicate there are currently 87,000 operations and the plan projects there will be 100,000 by the end of 2010? Does no make sense? There continues to be noise sensitive issues because of flight over populated areas.	See response to #3.19. 87,345 is the number for 2008 from the Terminal Area Forecast. 100,224 is the number estimated by multiplying 2010 based aircraft (432) by average operations per based aircraft (232). Will revise p. 2-9 to be more clear.	Yes
2.7	2-10	Golf course is on Airport Road. (correct)	Noted, text will be revised.	Yes
2.8	2-10	Social impact - If the state has to acquire land and business and homes are relocated, that is beyond constraint.	This is a general statement, quantifying what would be considered a "social impact" per the National Environmental Policy Act definition. Any proposed land acquisition would undergo NEPA review and the impact would be further assessed.	No
2.9	2-11	Farmland - What happens during the process of coordinating with NRCS?	NRCS coordination is conducted by FAA per NEPA requirements, once a project is identified and if the project includes a taking of farmland. Through consultation, the NRCS would need to be shown there's no feasible and prudent alternative to taking farmland for the use.	Yes
2.10	2-13	Wetlands - Are they not jurisdictional?	A wetland delineation was not conducted, so this is unknown. A delineation would be prepared if any development action could affect the areas in question.	No
2.11	2-14	Controversy - Not correct - There are opinions that the airport should exist but growth should have some constraints to insure livability in the community.	Noted, text will be revised.	Yes
2.12	2-15	Terminal area forecast of operations at 87,345 is shown as "actual data." How is this measured?	See response to #3.13. We will change the word "actual" to "estimated."	Yes
2.13	2-16	Fuel fees - 2010 down 12% from 2009 and down 8% from 2008. This is indication that airport activity is going down.	See response to #3.3. Not all fees were paid on time.	No
		Susie Stevens		
2.14	2-7	Other Support Facilities: Please add Wilsonville to this paragraph.	Wilsonville will be added.	Yes

2.15	2-7	Airspace: Note - From the City of Aurora only, but not to the north. What is the source of this sentence?	Overall complaints have been reduced and source will be given. Text will clarify that overall complaints have reduced, but complaint levels from the north have remained at a consistent level.	Yes
2.16	2-11	Farmland: Please add information from the Oregon Department of Agriculture on the designation of Foundation farmland.	Information will be added.	Yes
2.17	2-14	Other Issues: Add a paragraph on (vehicular) traffic.	Issues relating to vehicular traffic will be added to the environmental conclusion section.	Yes
2.18	2-15	Regarding the Terminal Area Forecast: It would be more informative to have a couple sentences explaining how this forecast is determined.	See response to #3.45.	Yes
		Clackamas County		
2.19	2-2	Area Topography. Incorrect: Not part of Mt. Hood National Forest	Marion County reports the forest extends into Marion County, as does the Clackamas River Ranger District Office.	No
2.20	2-2	Community and Airport History. Why not include when tower was 1st put on ALP? This will provide clarification on all structures planned.	Noted, this will be included.	Yes
2.21	2-3	Airfield Facilities. How often is runway rated? What type of aircraft does runway support - commercial, business? Is there a limitation on runway strength and future strength?	The runway is rated every three years. The runway supports General Aviation, which includes private and business operators but does not include commercial (airline) operators. Discussions relating to runway limitations are provided in Chapters Four and Five.	Yes
2.22	2-8	3rd paragraph. Unclear sentence, please restate for clarity. Are you saying that allowed uses on adjacent lands must be compatible with the airport imaginary surface overlays?	Statement will be clarified. The FAA does require that airport sponsors - to the extent of their ability - restrict zoning on adjacent lands and lands within an airport's immediate vicinity to compatible land uses.	Yes
2.23	2-8	Surrounding Area Land Use. This statement gives the impression that adjacent lands are RRFF5 and the golf course. Restate as "… further north of the airport are RRFF-5 zoned lands and a golf course."	Statement will be clarified.	Yes
2.24	2-8	Surrounding Area Land Use. Did not address local, regional or state land use laws and regulations. As long as there is not a proposal to expand the airport runway or locate a facility off of the ALP boundaries the MP does not have to address these regulations, however any expansion will require addressing local, regional and state laws to include an exception process. Then again the FAA guidelines in accordance with the FPPA will prohibity the expansion of the airport boundary on high value farm lands.	This chapter presents the existing conditions. Any actions proposed in this Plan - in subsequent chapters - will address local, regional and state land use laws and regulations.	No
2.25	2-9	1st paragraph. Clackamas County's Capital Improvement Plan (CIP) 2006-2008 Update shelved the Arndt Rd/99E (#267) in 02-23-05.	Noted, text will be revised.	Yes

2.26	2-9	2nd to last sentence. Is this an FAA requirement in response to PAC and community's concerns relating to noise impacts?	No, this is a standard planning requirement for airports. Occasionally FAA will waive this requirement for smaller airports. It has always been in the Scope of Work for this project.	No
2.27	2-10	1st paragraph. In the 2002 noise mitigation study, where was the noise redirected with the implementation of use of Runway 35? Need to see this runway on a map to know where it is.	Please refer to the exhibits for a visual of Runway 17/35. Aircraft landing Runway 35 are approaching from the south.	No
2.28	2-11	4th paragraph. This implies that extension of the airport lands cannot be achieved. The surrounding farmlands are considered high value farmland according to the 1985 soil survey of Clackamas County Area, Oregon, that identifies surrounding soils as type #3 Amity silt loam and #88 Willamette silt loam. Other high value soils surrounding the airport property include #68 and #69 Newberg loam.	Any proposed improvement off airport would undergo NEPA review, in which this concern would be addressed. See response to #2.9.	No
2.29	2-14	Conclusion. The Master Plan goals stated in the beginning of this document also commit the MP to include"… evaluation and minimum impacts of airport growth to include transportation."	See response to #2.17.	Yes
		Tony Holt		
2.30	2-7	4th para, second last sentence-**"complaints from neighboring Aurora have dropped---"**should note that they have not dropped at Charbonneau which is now suffering the wide spectrum of take-off noise.	See response to #2.15.	Yes
2.31	2-9	last para-the PAC needs to properly understand how the current annual operations number quoted of 87,345 was arrived at. Also, the sentence 'Because the majority of the adjacent land is in agricultural use, the number of noise sensitive uses is minimal' is ludicrous given the adjacent residential areas of Aurora and Charbonneau	See response to #3.45. When compared to other urban airports, there are fewer noise sensitive land uses. However, that statement does not negate the impacts at Aurora State.	
2.32	2-11	3rd para should also quote the Oregon Department of Agriculture study classifying areas as either Foundation or Important or Conflicted farmland. The area around the Airport is classified as Foundation farmland the D of A's top rated classification.	See response to #2.16.	Yes
2.33	2-14	2nd para who are the community members who **'desire closure of the Airport'**? 3rd para- under "Other Issues" traffic impacts should be mentioned.	See response to #2.17. Source will be added.	Yes
2.34	2-15	**Table 2D Operational Records**. The PAC needs to know how this was developed. It is fundamental to the key forecasts.	See response to #3.45.	Yes
2.35	2-14	Page 2-14, "There are some members of the community who are against airport growth and desire closure of the Airport and release of the land to other uses." Who are they??	Source will be added.	Yes
2.36	-	"An accurate inventory helps produce an aviation demand forecast---"	--	--

2.37	2-7	"Complaints from neighboring Aurora have dropped since this designation (calm wind 35) was enacted." Maybe, but not from Charbonneau.	See response to #2.15.	Yes
2.38	2-9	Under 'Human Factors' and 'Noise' talks about noise sensitive land uses and says "the number of noise sensitive land uses is minimal' because the majority of the adjacent land is in agricultural use.	See response to #2.31.	No
2.39	2-11	Under 'Farm Preservation' should also reference the Oregon Department of Agriculture study.	See response to #2.16.	Yes
2.40	2-14	'Conclusion' "Beyond controversy over noise and airport expansion, there do not appear to be any significant environmental issues on the Airport or in the airport vicinity." What about traffic??	See response to #2.17.	Yes
		City of Aurora		
2.41	2-1	Page 2-1 under Airport Location and Access hearing: "The city of Aurora is located approximately ~~one~~ **one-quarter** mile southeast of the Airport".	See response to #2.1.	Yes
2.42	2-6	Page 2-6 under Airport Support Facilities heading: Add text: "Surrounding communities have expressed concerns that additional growth at the airport and the potential for airport expansion will have negative impacts upon their water supplies and/or water quality. Advanced planning and feasibility assessments regarding the airport's ability to meet water, sewer, and fire protection needs for development and expansion are of concerns. While not required as part of the Airport Master Plan Update and not included in this document, the ODA recognizes the importance of completion of this work in the future. ODA is supportive of pursuing funding options for such studies and supports surrounding communities in their pursuit of funding for such studies".	Noted, text will be added.	Yes
2.43	2-6	Page 2-6 under Airport Support Facilities heading and Utilities subheading, add text: "While Oregon Department of Aviation recognizes the complexities of Oregon's land use system and potential need for upgrades to the City of Aurora utilities prior to annexation, ODA is generally supportive of annexation of the Aurora Airport by the City of Aurora due to the economic growth potential for the airport if it were connected to city services."	A reiteration of this point will be made. See response to #1.57.	Yes
2.44	2-8	Page 2-8 under the Surrounding Area Zoning and Land Use heading, please make reference to the Urban Growth Boundary Coordination Agreement with Marion County that has a section on the Airport and surrounding lands as an Area of Mutual Concern, and the IGA signed between ODA, Marion County and the City of Aurora. I can provide copies of these documents if needed.	Noted, text will be supplemented.	Yes

2.45	-	Reference should be made to the following City of Aurora Comprehensive Plan Goals and Policies (I can make a copy of the Comp Plan available if needed):	Noted, text will be supplemented.	Yes
	-	Goal 14- Growth and Urbanization. Policy 4: The city will seek the funding to evaluate the impacts of development of the industrial and commercial properties at the Aurora Airport and on surrounding lands to determine the role of the Aurora Airport in relationship to the Overall Objectives of the Aurora Comprehensive Plan and to identify formal and informal relationships needed to achieve mutually beneficial goals.		
	-	Goal 9- Economic Policies. Policy 1: The City will work closely with Marion County, the Oregon Department of Aviation, and the Oregon Department of Economic and Community Development to evaluate and balance the net value (cost/benefit) of the industrial and commercial potential of the Aurora Airport and surrounding lands. The City will strive to minimize potential land use conflicts within the mutual planning area in an effort to maximize the livability of the community.		
	-	Goal 11-Public Facilities. Policy 2 and 8: The City shall consider extension of a sewer and water line to the Aurora Airport industrial district if it is determined by the City and county that: a. The City is the most logical service provider; and b. The extension benefits the City economically; and c. Precautions prevent hook-ups to the line by property owners in the rural area between the urban growth boundary and airport; and d. In full compliance with applicable laws.		

Aurora State Airport Master Plan Update - Comments Received on Draft Chapter Three

Comment #	Page #	Comments received from: Nick Kaiser, Susie Stevens, Tony Holt, and Clackamas County	WHPacific Response	Will revisions to Chapter 3 be made based on comment?
		Nick Kaiser		
3.1	General	Why are the projections unconstrained? There should be some parameters. The last master plan one of the constraints was an ARC of BII.	Airport master plan forecasts of aviation demand are usually unconstrained. ODA did not feel it necessary to constrain the forecasts, particularly since there is undeveloped land at the Airport (ODA and private) for hangars, etc. ODA may elect to constrain the forecasts later in the planning process, as happened in the 2000 master plan update. (During the last master plan, ODA decided to constrain the forecasts by not meeting design standards for Airport Reference Code C-II.) Identifying how to constrain the future is much easier when you have an idea what the unconstrained future might be. The FAA typically produces unconstrained forecasts. The FAA's annual Terminal Area Forecast (TAF) (http://www.faa.gov/data_research/aviation/taf_reports/media/TAF%20Summary%20Report%20FY%202009%20-%202030.pdf) contains forecasts for over 3,000 airports. Page 3 of the TAF report published December 2009 says, "The TAF assumes an unconstrained demand for aviation services based upon local and national economic conditions as well as conditions within the aviation industry. In other words, an airport's forecast is developed independent of the ability of the airport and the air traffic control system to furnish the capacity required to meet demand." This information will be added to Chapter Three to more clearly indicate why the forecasts are unconstrained.	Yes
3.2	3-2	"Critical Aircraft" current analysis is an unconstrained mix. Where do you draw the line on size of plan?	Decisions about the size of the plan will be made later.	No
3.3	3-3	2010 trend is still down so how can operations go up?	Nationwide aircraft shipments were down the first quarter of 2010, although billings were up (p. 3-3). At Aurora, IFR traffic was up 22% for partial year 2010 (p. 3-10) and fuel flowage resumed growth in 2009 (p. 3-8).	No
3.4	3-5	Need to label the charts 3A and 3B.	Exhibits 3A and 3B have titles and sources, so the comment intent is not clear.	No
3.5	3-7	With the slight increase in US active aircraft and Oregon trending below that how can we show such a large increase in base aircraft? How can you conclude that operations will increase at the same rate as based aircraft?	Aurora's historical 2000-2009 growth is 7.0% annually (233 based aircraft in 2000 growing to 427 in 2009), while the national increase for 2000-2009 is 0.6% annual (Table 3A on p. 3-5). So, it is reasonable that Aurora's future growth is higher than the national forecast (1.36% compared to 0.9%). Using a constant OPBA for forecasting future general aviation operations is common in airport master plans. Historical info at Aurora shows operations sometimes go down when based aircraft go up and vice versa.	No
3.6	3-8	Aviation gas dropped 47% in 2008 and the increase in 2009 and 2010 is mainly jet fuel. Jets are a small portion of based aircraft so operations should have not increased at levels indicated.	Fuel is sold to transient as well as based aircraft. Jets have larger fuel tanks and on average are flown more hours than other fixed wing aircraft. This explanation will be added.	Yes
3.7	3-9	2002 & 2003 operaions were measured at 62,926. Chart 3C shows approximately 78,000?	See Table on p. 3-23 for the numbers in Exhibit 3C and see response to #3.13.	No
3.8	3-10	IFR operations in 2009 is approximately the same as 2002-2003. 2010 continues to be a bad year.	See response to #3.3. IFR is growing in 2010.	No
3.9	3-13	I don't see the correlation between the population growth in the core area and licensed pilots.	We did not specifically correlate population growth with pilot growth.	No
3.10	3-16	Based Jet aircraft went from 33 in 2007 to 21 today.	Noted. However, the number in 2006 was only 6. We tried to look at trends over time.	No

3.11	3-18	Based aircraft increase is not following the socioeconomic trends.	Based aircraft forecast is 1.36% annual growth. Average annual population growth in service area is 1.53% (p. 2-13). Metro forecasts for nonfarm employment are between 0.7% and 1.8% annual (p. 3-14).	No
3.12	3-21	Using preferred forecast 1.36% the based aircraft is too optimistic. It will not follow population growth or other socioeconomic trends. For based aircraft to increase at the forecasted rate there will need to be a lot more hangar space. (constraint?)	See response to #3.11. Hangar space needed for forecasts will be in Chapter Four.	No
3.13	3-22	The last actual operations recorded was 2002/2003 at 62,900. No actual data was taken in 2008.	Acoustical counts in 2002/2003 were estimates based on samples (as reported on ODA's website). We have not been able to account for the difference in operations reported from acoustical sampling on ODA's website and the operations reported in the Terminal Area Forecast, which the FAA says come from ODA. We will change the word "actual" to "estimated".	Yes
3.14	3-23	OPBA of 232 means there is little itinerant traffic (according to FAA guidelines). Table shows heavy itinerant traffic? The OPBA from the survey doesn't make sense?	We noted that FAA's OPBA guidance does not relate well with Aurora having considerable itinerant traffic, hence the discussion on p. 3-23 and 3-24. The survey was a random sample, but it did cover a wide range of aircraft types and convey average OPBA per fixed wing aircraft similar to FAA's historical records of aircraft and operations.	No
3.15	3-25	Preferred forecast 1.9% - At 232 OPBA the itinerant will be lower so how do you get to 1.9%/year?	In 2008, operations were 87,345 and the number of based aircraft was 422. The OPBA was 207, below the average of 232. 1.9% average annual growth is from 87,345 in 2008 to 131,312 in 2030.	No
3.16	3-26	Why large growth in itinerant from 51,000 to 85,000?	Itinerant operations are those that are not local (touch and go training, primarily) and are performed by both based and transient aircraft. The assumption is that training operations will comprise a slightly lower portion of total operations in the future, which often happens when airports grow busier. However, the growth in itinerant operations (2.1% per year) is not much different than the growth rate for total operations.	No
3.17	3-27	With 21 jets in 2010 what is the correct % of the jet capable airports.	We do not have 2010 information about the other airports, so cannot calculate that.	No
3.18	3-27	With 21 based jets and 432 total based aircraft (5%) how do you get to 13% of operations growing to 18%?	Business jet aircraft are used more often than piston aircraft. From Tables 3A and 3B, compare national averages by aircraft type. Piston aircraft are flown 83 hours per year and jet aircraft are flown 252 hours per year on average. Also, since it is jet capable, and most of the 46 other airports in the service area are not, Aurora will be used more by transient jet aircraft than most of the other airports. This explanation will be added.	Yes

3.19	3-28	There is a sensitivity to using an inflated operations per year number. Just going from 100,000 to 87,000 the peak hour operations goes from 40 to 34 and 80,000 gets you 32.	This comment is one of several concerned with inaccurate or inflated numbers of aircraft operations. The FAA uses aircraft operations estimates from airport owners to determine the number of aircraft operations at non-towered facilities, and assesses them for their reasonableness before publishing them in the Terminal Area Forecasts. See p. 3-22 through 3-24 for a discussion of different ways to measure operations at non-towered airports, FAA guidance for ratios of operations per based aircraft, and analysis of Aurora's operations per based aircraft compared to other airports in the region. The FAA's records of aircraft operations at over 2,000 airports across the nation are estimates, so reliance on estimates for planning is not unique to Aurora State. Here is how the number of aircraft operations could affect the requirements in Chapter Four: . The capacity analysis uses operations numbers. (However, the analysis will show that the runway has the capacity for many more operations than are estimated to occur at the Airport now or in the 20-year future.) Also, peak operations are used to project the amount of transient aircraft parking apron needed in the future. These projections help in planning the future layout of the Airport. However, neither ODA nor private entities will build more apron until actual need is demonstrated.	No
3.20	3-29	What % of the Aurora based jets is the runway design for?	Airports are designed for transient airplanes as well as based airplanes; this is not something a master plan would normally calculate.	No
3.21	3-29	Do we want to go to ARC C and open the door to much larger jets? What is max weight of jets in C category?	The standards for ARC C-II will be spelled out in Chapter Four, along with weight information about jets in C category that use the Airport. The decision about meeting those standards will be made later.	No
3.22	3-29	How many planes listed in the II category fit the weight restrictions (45,000 dual) currently at the airport? What increase would the runway weight capability have to be to fit the critical aircraft?	All or nearly all the current based aircraft have maximum takeoff weights below 45,000 pounds. The current and forecast critical aircraft mentioned on pages 3-30 and 3-31 weigh 23,500 and 36,100.	No
3.23	3-30	I thought that the current ARC was BII?	The Airport is now designed to meet ARC B-II standards. Operations at the Airport now meet the threshold for the ARC to be C-II.	No
3.24	3-30	What are the weight design specs fro ARC CII? What are the weight design specs for the Astra 1125 and Cessna Citation (X)? Is it 36,000# for both? Are the dual wheel? Footnote shows that ARC CI and CII have the same max takeoff weight?	ARC is based on approach speed, wingspan, and tail height, not weight. Aircraft in one ARC can and do have different weights. More information about different weights of business jets will be in Chapter Four.	No
3.25	3-30	Since 2009 C category jet operations are low and if you used 2009 and 2010 you would probably be below the 500 critical operations.	See p. 3-10. IFR Traffic is up 22% in 2010 compared to 2009, so that is probably not the case.	No
3.26	3-30	What are the runway design specifications for ARC CII? What is the Runway length specs for the Critical aircraft?	This will be in Chapter Four.	No
		Susie Stevens		
3.27	3-1	1st paragraph: Constrained projections should be part of the Master Plan if there is the possibility that ODA may choose to not meet the unconstrained projections.	See response to #3.19.	-
3.28	3-5	Oil prices: This seems unrealistic; perhaps a couple of other sources will provide credibility.	The oil price assumption is in the FAA's forecast for aviation activity nationwide (*FAA Aerospace Forecasts Fiscal Years 2010-2030* , March 2010) and is based on Global Insight's October 2009 oil price forecast. This is simply part of the description of the FAA's latest national forecasts. We don't have sufficient data about Aurora activity to distinguish the effect of high fuel prices in 2008 from effects of the recession or other factors in 2008. High fuel costs usually influence discretionary/recreational flying more than business travel.	No

3.29	3-10	Regarding business interviews: It would be helpful to know which businesses provided this information.	We promised those businesses confidentiality because they compete with each other. If there are any businesses at the Airport that believe this paragraph misrepresents their activity or projections for the future, we will delete the paragraph.	No/Yes
3.30	3-12	I suggest a paragraph that notes that Marion County is the entity that approves zoning and land use changes.	See Chapter Two, page 2-9: "The entire Airport is zoned ... in the Marion County Zoning Code. Marion County is the planning and building permit authority for the Airport."	No
3.31	3-16	Last paragraph: It would be interesting to see, maybe in the appendix, the Table 3I recalculated without Southend Airpark's growth. Sort of like eliminating high and low numbers to get a better average.	We may have mistakenly implied that the Southend Airpark was the only cause of the market shift and will revise the text to mention that the development and removal of hangars at other airports in the region may have contributed to the shift in market share. For example, the privately owned Evergreen Field in Vancouver with up to 165 aircraft closed in 2006 (http://www.airfields-freeman.com/WA/Airfields_WA_SW.html#evergreen). Several other private airports in the region closed between 1998 and 2007. In 2008, Portland International Airport removed 18 hangars for a road improvement project.	Yes
3.32	3-21	Preferred Based Aircraft Forecast: I realize PAC members may feel like we are going backwards, but this is such a critical paragraph. I suggest we discuss the assumptions made in choosing the Preferred Forecasts.	Noted for Dec. 9 meeting.	-
3.33	3-22	It's frustrating that we can't get an accurate count. Using the estimated forecast results in an operation every 6 minutes, 24 hours a day, 365 days per year. This seems too high.	See response to #3.19.	-
3.34	3-23	It would be good to note how the survey was done; how many sent, how many returned, etc.	See Appendix C. It is difficult to estimate how many questionnaires were distributed, but we'll try to quantify this more. See response to #1.20.	Yes
3.35	3-29	Last paragraph: It would be helpful to have a table showing the numbers of piston and turboprop aircraft operations, even if they are estimates. This relates to the ideas expressed at the first PAC meeting of a "vision" for the airport - what do the majority of users want. In 2000, ODA decided to constrain the forecast by keeping the ARC BII (pg 3-28). We should discuss this idea.	See Table 3M, p. 3-27. For a response to the comment about vision, see the response to comment #1.23.	No
3.36	3-32	With over 70% of the projected operations by piston or helicopter for the next 20 years, improvements should be geared to serve the majority of users.	Chapter Four will address the needs of piston and helicopter users. Following FAA guidance, airfield design is for the most demanding aircraft in regular use and then the airfield is adequate for all the less demanding aircraft.	No

3.37	-	In reference to the data and text on pages 3-28 through 3-31, is a designation of ARC C-II mandatory?	Probably not. The obligation to improve the Airport to meet demand is not in the 39 assurances that ODA makes when accepting Federal Airport Improvement Program grants. However, it is possible that the FAA will not fund a future airfield project if does not meet the design standards for the ARC. The FAA's guiding principles for investing in airports include: "Airports should be safe and efficient, located at optimum sites, and developed and maintained to appropriate standards," and "Airports should be flexible and expandable, and able to meet increased demand and to accommodate new aircraft types." On the other hand, cost beneficial investing is another guiding principle for the FAA, along with "Airports should be compatible with surrounding communities, maintaining a balance between the needs of aviation and the requirements of residents in neighboring areas." We believe the best time for deciding whether or not it is feasible to meet ARC C-II standards is after we know the impact of meeting those standards, later in the process. (The guiding principles are in the National Plan of Integrated Airport Systems (NPIAS) 2011-2015, p. 3, http://www.faa.gov/airports/planning_capacity/npias/.)	No
		Clackamas County		
3.38	-	Forecast Growth Rate for Jets. … It would seem that the linear trend would not be a valid predictor of future growth. Is there any factual basis for predicting that the rapid growth that resulted from the opening of the Southend Airpark will or can continue? Is there room within the existing airport boundaries or sufficient land available outside the airport? Zoning maps indicate that there is not. Is the ODA aware of any plans to change the surrounding zoning?	We agree that growth in based jet aircraft will not continue at the 5.9% historical growth rate. The 4.5% growth rate for based jets is substantially less than the historical rate, but comparable to the 4.3% annual growth from 2010 to 2030 that the FAA projects for jets nationwide (Table 3A). The forecasts are unconstrained. Evaluating the amount of land available will be in Chapter Four. If any change in zoning is contemplated, it will be later in the planning process.	No
3.39	-	Critical Aircraft. Is there any reason why the "critical aircraft" is different than the predominant aircraft of last year? How does this meet the "regularly" or "substantially" standards set forth on page 3-28?	The prevalent or predominant jet aircraft is the model that uses the Airport the most. This discussion just expands on what Table 3P shows. The most used aircraft is not the critical aircraft. The critical aircraft is the most demanding that regularly uses the Airport. The predominant jets in 2007 and 2009 were Airport Reference Code (ARC) B-I and B-II. ARC C-II has more demanding design standards (generally larger safety clearances) than ARC B-I or B-II, as Chapter Four will show. We will try to explain the distinction between predominant and critical for better clarity.	Yes
		Tony Holt		
3.40	3-1	1st para, 3rd sentence-**"These projections are unconstrained and assume ODA or others will be able to develop the various facilities necessary to accommodate based aircraft and future aircraft operations."** This is a fatal flaw in the conclusions so far. Constraints to growth must be considered in producing any accurate operations forecast(s).	See response to #3.1.	-
3.41	3-5	last para, the statement that **oil prices will not exceed $100 before 2025** is ridiculous given the limited supply of new sources of petroleum and increases in demand once the current worldwide recession is over. What is the source?	See response to #3.28.	-
3.42	3-9	**Exhibit 3C Historical Aircraft Operations at Aurora State Airport**. On the following page it is admitted that this is an estimate so Exhibit 3C should show that. How were these data it compiled? Sentence above Exhibit 3C says' The FAA keeps records of airport operations reported by airport owners'. Please explain this.	We will add that the airport owners estimate the operations they report to the FAA. Airport operators report estimated operations on periodically updated http://www.gcr1.com/5010web/airport.cfm?Site=UAO) and the FAA Airport District Office in Seattle reports numbers to Headquarters annually.	Yes

3.43	3-10	Exhibit 3D It is hard to believe that out of supposedly **90,000 total operations at Aurora in 2009 only 5,000 were IFR!!** Please confirm and supply source	We realize from our line-by-line analysis of jet IFR operations that quite a few IFR operations are not documented in the IFR records from GCR (http://www.airportiq.com/) because flight plans are filed after takeoff or cancelled before landing. We documented those unrecorded jet operations to identify the appropriate airport reference code, but jets account for less than half of the IFR records. When charting the IFR operations trend in Exhibit 3D, we felt using the data exactly as provided by GCR would be the best course of action. We are increasing the estimate of IFR operations to up to 10% of total operations to account for unrecorded operations. 36% of operations are classified local (touch-and-go) operations that are nearly all VFR. Underestimating or overestimating the IFR operations proportion of total operations has no impact on the facility requirements in Chapter Four, although the FAA might consider IFR operations numbers when contemplating new or different instrument approaches in the future. The consequences of underestimating or overestimating total operations is described in the response to #3.19.	Yes
3.44	3-15	**Based Aircraft Forecast**-explain how various forecast models were developed and the preferred one selected.	The explanation is in the chapter and can be discussed more at the meeting Dec. 9.	-
3.45	3-22	3rd para- the **FAA's Terminal Forecast** is mentioned frequently. What is it, how is it developed and explain how it is relevant.	The Terminal Area Forecast (TAF) is the FAA's annual forecasting for terminal control centers and for the approximately 3,300 individual airports that are in the National Plan of Integrated Airport Systems (NPIAS). According to the Terminal Area Forecast Summary, Fiscal Years 2009 – 2030, p. 3, "The TAF is prepared to assist the FAA in meeting its planning, budgeting, and staffing requirements. In addition, state aviation authorities and other aviation planners use the TAF as a basis for planning airport improvements." The TAF provides a benchmark for individual master plan forecasts. The FAA may modify or update the TAF based on an approved master plan forecasts. If an airport master plan forecast for operations exceeds the TAF by more than 10% in the first five years, they are sent to FAA Headquarters for review. According to Par. 428.a, FAA Order 5100.38C, AIP Handbook, the lack of FAA acceptance of forecasts may delay any further planning or capital improvements depending on them. See Appendix H for the comparison of Aurora's master plan forecasts and the TAF. We will add this explanation to the chapter. For more information about the TAF, see http://www.faa.gov/data_research/aviation/taf_reports/media/TAF%20Summary%20Report%20FY%202009%20-%202030.pdf.	Yes
3.46	3-29	last para-**"The airport has now passed the 500 operations threshold for Aircraft Approach Category C"**. How do we know? Where is it documented and by whom? **But there are not 500 operations for ARC C II.**	There are at least 500 operations for Aircraft Approach Category C and at least 500 operations for Airplane Design Group II, hence the ARC is C-II. Table 3P shows the number of Aircraft Approach Category C operations in FY 2007 and FY 2009 (665 and 377)—these include Airport Reference Code (ARC) C-I, C-II, and C-III. The average of these two years is 521. We consider this average a fair representation of activity because within the last ten years, 2007 was the peak year and 2009 was the valley year. To get these numbers, we counted individual jet operations in IFR records, adding VFR arrivals and departures as required. Here's an example of the backup for Table 3P. The table lists 293 ARC C-I operations in FY2007. These ops are: BAE 125-122, Israel 1124-15, Learjet 36-2, Learjet 45-4, Learjet 55-2, Learjet 31/31A-12, Learjet 35A-14, and Hawker 400/400A-122. A sample from the IFR data is copied below these comment responses.	No
3.47	-	All activity forecasts presented are unconstrained; that is unrealistic.	See response to #3.1.	-

3.48	3-5	The oil price prediction needs references as to source/basis. The prediction is totally unrealistic.	See response to #3.28.	-
3.49	3-10	Exhibits 3C and 3D indicate that of an estimated 88,000 operations at Aurora in 2008, only some 5,800, or 7% were IFR. That seems unrealistic.	See response to #3.10.	-
3.50	3-29	How do we know "the airport has now passed the 500 operations threshold for Aircraft Approach Category C, so the current ARC should be C-II"? What proof? Why C II ?	See response to #3.46.	-

ADDITIONAL INFO FOR DOCUMENTATION OF ARC

Exhibit 3D on page 3-10 lists IFR operations for all types of aircraft, piston and turboprop as well as jet aircraft. Table 3P is only jet aircraft.
The jet operations in Table 3P result from reviewing IFR records line-by-line and adding additional arrivals and departures as needed.
See the footnote on p. 3-29. Here is an example of an IFR record:

Aircraft - **N600ST** Make and Model **CESSNA 550** Class **JET**
ROBERTS FIELD to AURORA STATE - 02/13/2007 at 08:01 AM
REDDING MUNI to **AURORA STATE** - 02/13/2007 at 03:55 PM
ROBERTS FIELD to **AURORA STATE** - 03/07/2007 at 07:44 AM
AURORA STATE to **ROBERTS FIELD** - 03/07/2007 at 08:19 AM
ROBERTS FIELD to **AURORA STATE** - 03/07/2007 at 02:45 PM
AURORA STATE to **ROBERTS FIELD** - 03/07/2007 at 03:12 PM
ROBERTS FIELD to **AURORA STATE** - 06/11/2007 at 09:25 AM
AURORA STATE to **REDDING MUNI** - 06/11/2007 at 10:28 AM
SACRAMENTO MATHER to **AURORA STATE** - 06/11/2007 at 06:59 PM
BOEING FIELD/KING COUNTY INTL to **AURORA STATE** - 07/18/2007 at 12:19 PM
AURORA STATE to **ROBERTS FIELD** - 07/18/2007 at 04:18 PM
Total Operations 11

Operations need to be added to get the airplane from Aurora to Redding Muni on 2/13, from Aurora to Roberts Field between 2/13 and 3/7, and from Aurora to Boeing Field between 6/11 and 7/18.

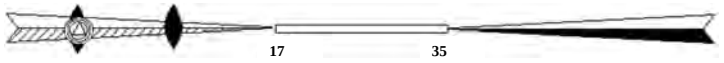
Nick Kaiser (submitted March 24, 2011)

3.51	3-22	1.36% growth in based aircraft will be dependent on what facilities are available at Aurora vs. other airports. What data other than population and Employment shows that Aurora will get this kind of growth?	It is an unconstrained forecast that assumes capacity will be built to meet demand. Chapter Three discusses historical growth at the airport, national and state aviation trends, other forecasts for the airport, and anecdotal projections by some businesses at the Airport.	No
3.52	3-24	According to the FAA guidelines having 240 OPBA indicates little itinerant traffic but according to the Aurora airport operations chart over half of the operations are itinerant?	The FAA uses two different meanings for the word "itinerant". Itinerant operations are those travelling more than 20 miles to/from the airport, and are performed by aircraft based at the airport and by aircraft based at other airports. Operations that are not "itinerant" are "local". Local operations are mostly touch-and-go and other training operations that stay within 20 miles of the airport. Local operations are also performed by both based and visiting aircraft. By saying that 250 OPBA is typical at a rural GA airport with little itinerant traffic, the FAA means little activity by aircraft based at another airport. Aurora State Airport's activity is not consistent with this guidance regarding OPBA, as discussed on pages 3-24 and 3-25 of Chapter Three.	No

Aurora State Airport Master Plan Update - Comments Received on Draft Chapter Four

Comment #	Page #	Comments received from: Tony Holt, Nick Kaiser, Bruce Bennett, Roger Kaye, and City of Aurora	WHPacific Response	Will revisions to Chapter 4 be made based on comment?
		Tony Holt		
4.1	General	Repeating a question I asked at the last meeting, to ensure a response: Current runway length is 5004ft. What is the current length of the required 'safety zones' (sz) at the north end and the south end? What is the distance from the ends of the current safety zones to the airport fence (F) at the north end and the south end? For example, what are the following distances: F---------I---sz----I---------- runway----------I----sz----I----------F	Safety zones are referred to as Runway Protection Zones (RPZs) per FAA Advisory Circular 150/15300-13. Table 4C (page 4-8) shows the RPZ dimensions for the existing condition (ARC B-II with approach minima greater than 1 statute mile), as well as for ARC C-II (all approach minimums). The dimensions you requested are shown below, along with the Runway Safety Area (RSA) lengths (Runway 17 end is to the north, and Runway 35 end is to the south): RPZ length beyond Runway 17: 1,200' RPZ length beyond Runway 35: 1,200' Runway 17 RPZ end to fence: 847' Runway 35 RPZ end to fence: -154 (RPZ extends south of Keil Rd) RSA length beyond Runway 17: 300' RSA length beyond Runway 35: 300' Runway 17 RSA end to fence: 1,747 Runway 35 RSA end to fence: 746'	No. Chapter 5 addresses these issues.
4.2	General	If the runway was lengthened as much as possible without expanding outside the current airport fence, what would be the new runway length and how long would the new 'safety zones' be?	Draft Chapter 5 shows an alternative that extends the runway, while keeping within the current Airport footprint. The appropriate RPZs and RSAs are shown in each alternative.	No. Chapter 5 addresses these issues.
4.3	General	Chapter 5 of the FAA Advisory Circular on Airport Master Plans talks about 'Environmental Considerations' and spends considerable time talking about noise pollution. It mentions noise levels as one of the three most common environmental concerns, talks about a noise compatibility planning program and noise overlay zones. When will this master planning exercise talk about noise? Hopefully it will be before a choice of "possible development alternatives" is made since that must surely be a factor in basing a decision.	Per the Scope of Work, noise contours are developed for Draft Chapter 5. Within Chapter 5 each alternative, including the no build alternative, will be shown with the noise contours. The FAA's Integrated Noise Modeling (INM) program is used to develop the contours. Additionally, an environmental overview for each alternative is given in Draft Chapter 5, wherein noise is an important component for analysis. The noise contours and subsequent analysis will assist decision-making for the "Preferred Alternative."	No. Chapter 5 addresses these issues.
4.4	General	Regarding the survey, it is interesting that of the 61 respondents only 10, or 16%, would publicly say that they have constrained operations. It is interesting also that these 10 operators are content to use KUAO, rather than move to Hillsboro or elsewhere, even though they claim to be constrained. It is also interesting that one operator claims to be about to purchase a new Citation X even though he knows that aircraft may be constrained. It makes one wonder why considerable taxpayer money may be expended to make these already happy operators even happier.	Two surveys were distributed for this planning project: Airport User Survey and Runway Length Survey. The responses you reference are from the Airport User Survey. This survey was distributed at FBOs on Airport and at nearby airports, and on the project website. Many of the respondents were operators of single engine, piston-driven aircraft that have vastly different needs than business jet users. The Runway Length Survey (Appendix I) was distributed to a targeted group identified by IFR flight records that would likely be constrained due to runway length. The runway length analysis identified 358 constrained annual operations based on those survey returns (this number will likely change, as more surveys continue to be returned), see page 4-13. Many factors are used by operators to determine where they base their aircraft - or operate in and out of - in addition to runway length (*i.e.* , location, hangar availability, etc.).	No

4.5	4-2	1st paragraph, talks again about the ARC being C-II. This claim is based on arbitrarily picking two years (2007 and 2009) and averaging them with the defense that one is the decade's highest activity year and 2009 is apparently the decade's lowest year. That is not a robust enough analysis to justify big changes in airport facilities at KUAO. And while we're on that topic, the fact that one operator talks about buying a Citation X surely cannot justify announcing it as the new, official, 'critical aircraft'.	The averaging of two years was a reasonable way to account for the extraordinary impact of the recession. We did not examine more than two years because tallying this information is very labor intensive. There are airports that upgrade their ARC based on forecasts only, without having already surpassed the 500 operations threshold as Aurora has. The ARC represents a family of aircraft and the representative aircraft chosen as the critical aircraft is the one in that ARC that uses Aurora the most. Since the forecast chapter was prepared, an Astra aircraft (ARC C-II) has based at Aurora. (The Astra was listed as the current critical aircraft in the forecast chapter, due to operations by transient aircraft.) Astras were introduced in the mid-1980s. The Citation X is a newer business jet model in ARC C-II and so is likely to remain in the business jet fleet longer than the Astra. If the Aurora tenant purchases a Citation X, the number of Citation X operations will increase considerably in the future from the number occurring now. The Citation X is neither the heaviest airplane using the airport nor the one needing the longest runway, as shown in Table 4E. Consequently, there is no need to fear that future airport design will be focused on that one aircraft. ODA has not yet decided to upgrade the airport from ARC B-II to ARC C-II and will not before considering the development alternatives that show both ARCs.	No
4.6	4-5	The table at the bottom of the page, I presume the hourly capacities mentioned for VFR and IFR are either /or, not additive? It is interesting that one respondent to your questionnaire says "---we have only a single runway which under normal economic conditions is close to the maximum traffic possible now."	Yes, the capacities are not additive, because weather is either visual or instrument. One user may feel the runway is close to maximum traffic, but examples of busier airports with one runway include McClellan-Palomar (Carlsbad, CA) with over 170,000 annual ops and Scottsdale with over 190,000 annual ops.	No
4.7	4-14	Runway Pavement Strength---currently 45,000lbs for dual wheel and taxiway currently 60,000lbs, so if mtow of ARC CII aircraft is more than 45,000lbs and they are using the runway, why is "the current strength rating adequate for the current runway length and using aircraft"?	As shown in Table 4E, not all ARC C-II aircraft have a maximum takeoff weight (MTOW) greater than 45,000 lbs (seven aircraft are shown to have MTOW's greater than 45,000 lbs, regardless of ARC). While this list is not all inclusive of business jets, it is representative of the common business jet fleet, which shows MTOWs can vary greatly. Rarely do aircraft operate at MTOW, due to constraints such as runway length or high ambient temperatures, nor do operators fill the fuel tanks completely if the flight does not require it for safe operations. As such, it is our analysis that because of constraints, such as runway length limitations, few operators will be able to take off with weights greater than 45,000 lbs. ODA, in some instances, has issued waivers for heavier aircraft to operate at the Airport. If the runway were extended, however, operators would be less constrained and more likely to put on more fuel, for instance, thus increasing the aircraft's weight and the need for the pavement strength to be increased. Even with increased pavement strength, operators are not likely to operate at MTOW.	Yes, clarification will be added as to why the current strength rating is adequate for the existing runway length and aircraft fleet.

4.8	4-17	1st bullet, if FAA approves this additional departure procedure will it (and a 90-degree left turn) become mandatory, even without a tower?	Departure procedures, unless flying under instrument flight rules (IFR), are not mandatory for aircraft operators. An air traffic control tower (ATCT) would be able to direct both IFR and visual flight rules (VFR) traffic on the departure procedures. The purpose of an ATCT is to provide aircraft separation and sequencing. Without an ATCT it is solely the pilot's discretion on how to operate safely.	Yes, clarification will be given.
4.9	4-17	3rd bullet, please explain “allow a back course approach”.	Runway 17 has a localizer approach. A "back course" approach would utilize the Runway 17 localizer to give approach guidance for Runway 35. See the drawing below. The hatched chevrons show the localizer, while the solid chevron represents the back course approach. Tracking the back course approach inbound gives reverse sensing unless the aircraft has an HSI (horizontal situation indicator) installed; meaning if the indicator shows course deflection to the left, the pilot would actually correct to the right to get back on the localizer course. For this to work at Aurora State, the distance measuring equipment (DME) associated with the localizer would require an upgrade. Utilizing a back course approach to Runway 35 would reduce the conflict of flight students practicing the Runway 17 localizer approach during calm wind conditions (Runway 35 is the preferred calm wind runway). 	Yes, clarification will be given.
		Nick Kaiser		
4.10	General	In the 2000 master plan update it was noted that the operations acoustical counts for 1997 were not totally accurate but the procedures would be improved for 1998. Were there acoustical counts taken in 1998 or beyond?	According to ODA records (http://www.aviation.state.or.us/Aviation/docs/RENSSummary94-02.pdf), four counts have occurred since the 1997 cycle. The results were: 1998-99 = 74,056 ops; 1999-2000 = 57,823 ops; 2001-02 = 58,479 ops; and 2002-03 = 62,926 ops. The RENS counts are estimates, based on seasonal acoustical samples. While procedures were improved, flaws with the RENS program are inherent (*i.e.* , aircraft noise not "triggering" the system, false-positives, etc).	No
4.11	4-7	How does the C II design standards affect land use outside the airport boundary if the RSA requirements goes from 300’ to 1000’ and the RPZ goes from 1000’ to 1700’? What can be built in the RSA and RPZ? Where do you start the measurement for the increased RSA and RPZ requirements?	If the RPZ extends off airport, the FAA recommends ODA acquire the property; however, in some cases avigation easements would be allowed. Regardless of ARC, the RPZ begins 200' beyond the runway end. While it is desirable to clear all objects from the RPZ some uses are permitted, provided they do not attract wildlife, are outside of the Runway object free area (OFA), do not allow assembly of people, do not allow bulk fuel storage, and do not interfere with navigational aids. If the RSA extends off airport, ODA would acquire the property. Table 4C shows the RSA length beyond runway end for ARCs B-II and C-II. The RSA must remain free of objects, except for objects that need to be located in the RSA because of their function (those objects higher than 3 inches above runway grade should be constructed on frangible mounted structures).	No. Chapter 5 addresses these issues.
4.12	4-10	Is there a category of mid size airplanes that could be applied to table 4D?	No. These are the categories included in FAA's design program.	No

4.13	4-18	Will wastewater land requirements be considered when the final land needs are identified for the various airport designs?	Wastewater land requirements for development needs on state-owned property will be identified in Chapter 5.	No. Chapter 5 addresses these issues.
4.14	4-26	(land use planning) The city of Aurora's comprehensive plan and vision plan have references to current and future airport opportunities and issues and should be reviewed in the master planning process. Also the City has an Urban Growth Boundary Coordination Agreement with Marion County that has a section on the Airport and surrounding lands as an Area of Mutual Concern.	These planning documents will be reviewed and included, as appropriate.	Yes. Documents cited in Chapter 2.
		Bruce Bennett		
4.15	General	Should the current weight restrictions of both based and visiting aircraft be mentioned in the length sections?	See response to 4.7.	No
4.16	General	Please be advised a 27,400 pound Hawker 800A s/n 2580055 (federal registration N855BC pending) has flown into Aurora and is based here until eventual sale, it is not now flyable but will be when registration is complete and US Airworthiness established and issued.	Noted.	No
4.17	General	I request the addition of the attachment to the master plan; this follows up on my comments at the last meeting and on my attempt to keep things in perspective. (attachment shown below)	The information will be included in an appendix of the Final Draft Master Plan Update.	No
4.18	4-11	Table 4E. JHRD does base their Citation CJ3 at UAO.	Noted, table will be corrected.	Yes
4.19	4-16	We do have precision instrument approaches (GPS 17 & 35) although with high (1 mile) visibility.	The Airport has LPV (localizer performance with vertical guidance) approaches, which are considered nonprecision.	No

Aurora Airport Relative Runway Length & Strength Comparison

Based on FAA Airport Facility Directory dated 18 NOV 2010
Compiled by Aurora Aviation December 13, 2010

Airport	MAX Strength	Runway Length
UAO- Aurora State	45K	5004
AST- Astoria	119K	5796
Baker	82K	5095
Bend		5200
Burns	90K	5100
Christmas Valley		5200
Toketee		5350
Corvallis	100K	5900
Cape Blanco	340K	5100
John Day		5220
Joseph		5200
K-Falls	230K	10301
LaGrande	130K	5600
Lakeview	109K	5306
Madras	180K	5089
McDermitt		5900
McMinnville	80K	5420
Newport	170K	5398
OTH- N. Bend	190K	5980
Ontario	50K	5011
PDT- Pendleton	210K	6301
TTD- Troutdale		5399
RDM- Redmond	200K	7038
RBG- Roseburg	88K	4602
Scappoose	90K	5100
Sunriver		5455
The Dalles		5097
Tillamook	125K	5001

		Roger Kaye (asked at the PAC #3 meeting)		
4.20	4-26	The zoning/planning discussion should be deferred to Chapter 5. If were to remain in Chapter 4, there could be conflicting data.	The recommendations given would remain, regardless of alternatives presented in Chapter Five, as they are broad and conform with State guidance given in the Oregon Aviation Plan.	No
		Nick Kaiser (submitted March 24, 2011)		
4.21	4-13	Constraints have increased from 358 to 473 and at the last PAC meeting it was said that it was now even higher. Does ODA have a way to verify these constraints?	Names, phone numbers, addresses, N numbers, and aircraft types can be verified through public records.	No
		City of Aurora		
4.22	4-24	Add text to the effect that public services/facilities should be planned in accordance with needs and capacities rather than be forced to respond to development as it occurs.	Chapter Four identifies facilities that would be required to meet the forecasted demand. Planning and the phasing of specific projects, including utilities, is more appropriate in later chapters of the Plan.	No
4.23	4-25	Under Utilities subheading, add text, "The City of Aurora has express concerns that additional groundwater wells or expansion of water facilities at the Aurora State Airport will have negative impacts upon the City's current water supply. Drinking water quality is also a concern for the City. Continued development and/or potential expansion of airport facilities without proper advanced planning and feasibility assessments regarding the airport's ability to meet water, sewer, and fire protection needs concerns the City.	Noted, text will be supplemented.	Yes
4.24	4-25	Under Utilities subheading, add text, "While it is not within the scope of the Airport Master Plan Update to collect data on surrounding properties and potential expansion of the airport boundary and whether expansion of the airport boundary would be able to provide adequate water or sanitary sewer service (septic or otherwise), the City has requested that the Master Plan Update provide additional documentation as to the adequacy of water, sewer, and other proposed utilities of existing facilities and within the existing airport boundary prior to adoption of the plan document. It is the City's position that adequate consideration of impacts to public facilities and services such as water, sanitary sewer, storm water, and traffic should be given as part of the Plan Update".	This request is outside of the Plan's Scope of Work. Issues relating to utilities will be addressed, as specific projects are identified.	No
4.25	4-5	Under Airfield Capacity: Reference should be made to the Airport Planning Rule here and the requirement that land use applicants should *show* that the proposed increased capacity and projections for flight growth/need *cannot* be reasonably accommodated in the existing airport boundary.	This section is relating to runway capacity; therefore, this addition would not be appropriate.	No

Aurora State Airport Master Plan Update - Comments Received on Draft Chapter Five

Comment #	Page #	Comments received from: Fred Netter, Dan Riches, Nick Kaiser, Tony Holt, City of Wilsonville, City of Aurora, Marion County, and Dave Waggoner	WHPacific Response	Will revisions to Chapter 5 be made based on comment?
		Fred Netter		
5.1	General	Since our role is safety and we strive to be "the safety experts", we place this as our number one concern. We support any proposals that enhance safety as well as protecting the other patrons of our district from economic hardship or undo inconvenience.	Noted.	No
5.2	General	After evaluating all of the proposals, we concluded that a fire facility consisting of two apparatus bays should be included in any plan, even the "no build". We believe this facility should be located by the airport water supply facility along Airport Rd. This location best serves ARFPD for accessibility and eliminates the problem of security. Since this facility is necessitated by airport use and business, it should be paid for by airport generated funding.	Noted, the Preferred Alternative will reserve land for a facility in the location supported by the ARFPD. Funding sources will be identified at a later time. As an Airport Rescue and Fire Fighting facility is not required at the Airport, funding from FAA or ODA is unlikely.	No
5.3	General	We would support the expansion of the runway both north and south as long it does not impinge on the use of private property, both farm and non farm, or result in increased response times or call volume for ARFPD without funding increases.	A runway extension has been shown to be infeasible at this time.	No
5.4	General	Necessary changes in area intersections and roadways must be part of any plan with a focus on safety.	Traffic impacts of proposed development will be evaluated as projects are defined.	No
		Dan Riches		
5.5	General	Columbia Helicopters supports modernization and possible extension of the … Airport runway to provide for a safer operating environment … however, it cannot support any proposal that would restrict business development of our property.	See response to #5.3.	No
		Nick Kaiser		
5.6	General	Need to correct the calm wind runway in chapter 5 pages 9 , 15 , 20.	Yes, these errors will be corrected.	Yes
5.7	5-2	ODA and FAA will establish departure procedures for both runway 35 and 17 to avoid flight over noise sensitive areas.	Runway 17 will be included in the text.	Yes
5.8	General	I still feel that the number of actual operations used, as base data in this study is too high. There should be an actual count made over the various seasons of the year to validate the number and type of operations.	See response to #3.19.	No
5.9	General	The number of operations for critical aircraft that exceeded 500 is still borderline.	See response to #3.25.	No
5.10	General	Constrained operations need to be further validated. The timing of implementing any alternative that is based on constrained operations should be looked at again after further study.	See response to #4.21.	No
5.11	General	There should be a category of airplanes that is used in the study that is medium size not just small and large. The study mix that includes medium size might show a better fit.	The aircraft called "large jets" in the noise input are actually medium-sized according to the industry (see Table 4A in Chapter Four).	No
5.12	General	The preferred alternative should not extend past the current airport boundary, including the RPZ.	Noted.	No
5.13	General	The weather is below 1 mile visibility a small % of the time so having an approach that is usable in lower visibility minimums might not be necessary.	Noted.	No

5.14	General	Calm Wind runway 35 has worked to help abate noise over populated areas and should be continued.	Agreed. See response to #5.6.	No
5.15	General	Having a control tower will help with Safety and Noise.	Noted.	No
5.16	General	In the short term no change in the airport (except for a run-up area for runway 17) is needed and should be adequate to accommodate planned business growth.	Noted.	No
5.17	General	A longer-term look could accommodate a build alternative like number 1 and still stay within the boundaries of the airport.	Noted.	No
5.18	General	All livability issues from the surrounding communities need to be considered when Airport development changes are planned and all long-term impacts are not thoroughly understood.	The planning team has tried to consider these needs, as outlined in the Goals and Issues section of the Master Plan.	No
5.19	General	How did you use the noise data from the 2002 noise study to help develop the noise contours for each alternative?	The 2002 noise data was utilized to determine the model aircraft type and the percentage of operations in a given group (i.e. turboprop, small prop, large prop, jets, and heli). The operations data from this older study was not used to determine the number of operations – just the group makeup. The same group composition (percents and aircraft) was used for each alternative, with the only change the operation numbers between existing conditions and the future conditions.	Yes
		Tony Holt		
5.20	General	Constrained Operations: Given the proviso that the FAA requires airport sponsors to document at least 500 annual itinerant aircraft operations before considering funding of a runway extension (Chapter 4, page 4-11), it is vitally important that proper and accurate documentation be provided by operators demonstrating past constrained operations. Simply sending surveys to based aircraft operators and a wide selection of non-based operators, including some aircraft brokers in California, and asking them how many constrained operations they estimate they have had (or even would have) at Aurora Airport, is insufficient and can lead to possible manipulation of the data. There needs to be a more rigorous attempt at accurate documentation from logbooks or other records. Given that more surveys were returned and mentioned at the last PAC meeting I believe this is a valid topic for Chapter 5.	See response to #4.21. The mailing list for the questionnaire was compiled from IFR records of aircraft that operated frequently at the Airport.	No
5.21	General	Predicted Noise Contours: It is notable that the maps shown as Exhibits 5E-5H have predicted (after a tower is installed and new departure rules are approved by the FAA) noise contours that stop short of Wilsonville City Limits. Clearly, the noise does not stop at the 55 dBA contour. The contours should continue northward to show what noise level is experienced over the City of Wilsonville, including that caused by landings on runway 17. The noise analysis was poorly explained at the last PAC meeting, in my view, and more time should be spent discussing the basis for the conclusions.	The FAA requires noise contours to the 65 dBA line be shown, we have shown contours to the 55 dBA line. The contours show an averaging of noise exposure and we acknowledge there may be noise events of the City of Wilsonville that exceed the average contour line.	No
		City of Wilsonville		
5.22	General	The Wilsonville City Council recognizes the Oregon Department of Aviation master planning obligations, and supports an Aurora State Airport Master Plan alternative that achieves the following outcomes:		
5.23	General	Improves management of aircraft approaching and departing Aurora State Airport that results in minimized noise and enhanced safety to the City of Wilsonville;	Noted.	No
5.24	General	Eliminates the need to expand the runway to the North in a way that impacts current facilities;	Noted.	No

5.25	General	Preserves foundation farmland by restricting future airport development to the property suitable for airport use and bounded by the Hubbard Cutoff to the West, Airport Road to the East, and Arndt Road to the North;	Noted.	No
5.26	General	Supports concurrency by recognizing surface transportation impacts on Airport Road resulting from future development and allowing for cooperation with Clackamas and Marion Counties on the scope and funding of any future improvements that may be required;	Noted.	No
5.27	General	Recognizes a preference for preserving the existing use of Keil Road.	Noted.	No
		City of Aurora		
5.28	5-2	When addressing demand, please specify whether land is public or private or a combination of both to meet hangar demand, aprons and aircraft parking, cargo apron, fuel tanks, etc. (bullets under "Landside Requirements")	As shown in the alternatives, the allocation of these items vary by alternative. Therefore, it would be inappropriate to allocate specific acreages.	No
5.29	5-3	It is my understanding that the Aurora Rural Fire Protection District has not yet identified the site for their new facilities and this was confirmed with the fire chief. While the fire district may have identified the need to park a vehicle at the airport, this distinction needs to be made. Also, please specify how much land is being dedicated/set aside for the fire district under Landside Requirements.	The acreage allocation will be added. ODA and the District acknowledge a specific site has yet to be determined. The alternative merely show areas that would be suitable.	No
5.3	5-3	3rd bullet from the top re: Airport Road. Improvements to Airport Road will occur as improvements occur and will require Traffic Impact Analysis (TIA) from Marion County. This bullet should be completely removed as it is not a statement of fact. ODA and private owners WILL BE required to work with Marion County and City of Aurora as improvements to Airport Road are REQUIRED as a result of development. Funding for improvements are based upon traffic impacts of development. I can provide suggested language from Marion County if requested.	Noted, section will be revised as appropriate.	Yes
5.31	5-3	2nd to last paragraph, please clarify whether the needs for 40 developable acres to meet demand includes: ODA land, private land, or a combination or both. This is clarified later in the text (pages 5-4) but it should be made clear from the beginning. Also include information regarding whether the 40 acres includes needs for water and sewer to accommodate this growth (i.e. Septic fields)	This paragraph states ODA only has nine developable acres, implying development will be a combination of private and public lands. The 40 acres includes allowances of 3 to 4 times the building floor or individual vehicle/aircraft parking area, to account for circulation, fire separation, inefficiency in layout, etc. Depending on how many facilities have plumbing, the land allowance may not be enough for septic fields.	Yes
5.32	5-3	2nd to last paragraph- Again, the Aurora Fire District has not identified a site for their new facility. Please remove reference to the Fire District facility.	See response to #5.29.	No
5.33	5-4	Includes the following statement, "Combining 9 acres of undeveloped State-owned property and 26 acres of undeveloped private property currently zoned for airport use this is a shortfall of approx. 5 acres… over the next 20 years…adjacent property is shown to be suitable for airport-related development. This area incorporates approximately 16 acres. This land, now used as a church camp…" Please explain how the adjacent lands cannot meet the need for 5 additional acres over the next 20 years.	We project a need for 40 acres of landside development over the next 20 years and 35 acres are available for development on either state-owned land or privately owned land that is zoned appropriately for airport use. To provide for the 5-acre shortfall, the church camp is the most suitable for converting to airport development, given its location. The explanation of our 40-acre projection begins on p. 4-18 of Chapter Four.	
5.34	5-4	"Development of private property, adjacent to the Airport, would be permitted-consistent with local and State regulations". This sentence does not provide an appropriate explanation of the land use constraints associated with rezoning EFU land to Public including application to Marion County for Oregon Planning Goal 3 exception. Language from Marion County should be requested and submitted here.	This statement is referring to the adjacent private property on-airport currently zoned as Public, which would be consistent with zoning. Clarification will be given that the No Build Alternative is only a no build for the state, private property (*i.e.* , Southend Airpark, Columbia Helicopter, etc) could still be developed. For the church camp property, a statement will be included to detail the Planning Goal exception.	Yes

5.35	5-5	"The runway extension would accommodate… Keil Road would be dead-ended". Please specify whether this Alternative would result in the loss of road access/frontage for any property owners along Keil Road.	Information will be added to text.	Yes
5.36	5-9	Alternative 2 Noise Contours should acknowledge that by moving closer to the City of Aurora and its surrounding communities would result in a significantly higher impact as the number of residential impacts is much higher than any other alternative since the City of Aurora is primarily residential in nature in the NW end of the city limits and UGB.	Text will include a statement that the 65 dBA contour line would incorporate more residential properties than the other build alternatives.	Yes
5.37	5-15	1st paragraph: Remove reference to the No Build Alternative not presenting noise concerns. The document has acknowledged that the No Build Alternative would still result in growth at the Airport, simply within the current land use boundary. As such, growth at the Airport will continue to have noise concerns/impacts of growth upon surrounding communities.	This statement relates to FAA thresholds of noise impact. A statement will be added that surrounding communities are concerned of the increased noise expected at the airport due to the increase in operations.	Yes
5.38	5-16	Please provide clarification on why avigation easements will be sought on residential lands but agricultural use lands will require acquisition. All lands south of the airport are EFU, some of which include residential uses along with their EFU zone. If the ODA is to pursue acquisition of some lands and only avigation easements over others, this needs to be explained in more detail. In addition, the document later references (on page 5-17) that the FAA may allow continuation of agricultural practices in the RPZ based upon the commodity produced. Whether or not property owners with EFU lands can pursue avigation easements rather than acquisition needs to be explained.	Please refer to the Preferred Alternative and the proposed plan for acquisition/easement within the RPZ.	No
		Marion County - Patti Milne		
5.39	General	An air traffic control tower at the airport can improve safety and reduce the impact of air traffic over residential properties in the area.	Noted.	No
5.40	General	A fire facility at the airport is necessary…	Noted.	No
5.41	General	Based on information provided throught the planning process, we favor an extension of the length of the runway and an increase in it's weight-dearing capacity to support safe and economically efficient airport operations.	Noted.	No
5.42	General	Marion County would support instrument upgrades that improve safety through improved technology.	Noted.	No
5.43	General	Marion County supports ODA's efforts to design departure procedures and designate a calm-wind runway…	Noted.	No
5.44	General	Marion County recognizes that Aurora State Airport is different from many airports in the state… Marion County encourages ODA as well as property owners in the Public Zone at the airport to continue working collaboratively with Marion County on landside development, zoning issues, and traffic impacts in the area outside the airport property.	Noted.	No
		Dave Waggoner		
5.45	General	Modify Build Alternative 1 (600' runway extension to the north) by adding a 400' Displaced Threshold.	Displaced thresholds and the use of "declared distances" (different runway lengths for different components of takeoff/landing) are not recommended at this Airport and they are not supported by the FAA for Aurora. Declared distances must be approved by the FAA. The FAA would rather invest in pavement that can be used for both landing and taking off, otherwise they are only getting half of the utility from their investment.	No

Aurora State Airport Master Plan Update - Comments Received at the Planning Advisory Committee (PAC) #4 Meeting

Comments received from PAC Members and the Audience that warrant further response/clarification	WHPacific Response
If the runway object free area (ROFA) extends, what will happen to the highway?	The highway would not be relocated. ODA would request the FAA to approve modifying the ROFA standard to allow the highway to remain. Recent conversations with the FAA indicate the request would likely be approved.
Have you considered what this project will do to the town of Aurora? Who needs this extension?	Yes, surrounding communities have been considered, including Aurora. The City of Aurora also has a seat on the PAC. As for the extension question, please refer to Appendix I.
Currently the flight plan/pattern is not followed, especially at night. Planes fly right over houses and shake the windows. Concerned about the future safety and who disciplines pilots who fly in no flight zones.	The flight pattern and noise abatement procedures are recommended, not required in most situations. The air traffic control tower will allow for better oversight of operations and sequencing of traffic.
Can we use the additional capacity at Salem Airport rather than expand Aurora?	While there may be unused capacity at Salem, users prefer to operate at Aurora.
What does it take to become a C-II Airport?	For the most part, the Airport already meets C-II design standards. Notable changes would be the increased runway object free area (ROFA) width and increased runway protection zone (RPZ) size.
Can alternative 1 become a C-II with all other elements remaining the same?	Yes, however, the ROFA, RPZ, and runway safety area (RSA) would have to increase in size.
Since we are already a volunteer fire station in Aurora, who will pay for a new fire facility?	We do not know. ODA could not obtain a grant from the FAA to pay for such a facility, since the Airport does not have airline service (therefore a fire facility is not required). Consequently, ODA would not be able to fund construction of the facility. ODA could lease land for the facility, however.
Can you request a modification to standards of the ROFA (on Highway 551) from the FAA?	Yes, see first response above.
Why do you need more clearance for a more precise approach?	A more precise approach allows landing in lower visibility conditions. Larger safety clearances increase the margin of safety - they account for the fact a pilot cannot see as far as in clear weather.
Has ODOT gotten onboard with road improvements, especially Keil Road?	ODOT has reviewed the alternatives, and has expressed concern over the possiblity of closing Keil Road.
If the current noise/flight pattern policy isn't being followed, why would a different policy be followed?	Efforts to educate pilots would continue and the air traffic control tower could provide oversight of operations.

Where is the money/funding for the project coming from?	No specific projects have been defined yet. For those projects eligible for FAA funding, the FAA could fund up to 95% of the project costs. The remaining responsibility would fall on the state or private developers (depending on the project).
Will there be any consideration for jet fumes in any of the future alternatives?	We see no appreciable difference in the alternatives regarding jet fumes. An environmental assessment for a runway improvement would look at air quality in more detail.
Who enforces the noise abatement procedures?	There is no enforcement; they are recommendations.
Will future zoning be amended due to the expanded noise footprint?	We do not know. The FAA and airport owners encourage local governments to make zoning around airports consistent with the FAA's aircraft noise/land use compatibility guidance. According to FAA guidance, any land use is normally compatible outside the 65 DNL noise contour. Guidance for land use compatibility inside the 65 DNL contour is in FAA Advisory Circular 150/5020-1, Noise Control and Compatibility Planning for Airports, Appendix 1.
What will be done to mitigate noise from maintenance on jet engines?	No mitigation is proposed at this time.

Appendix H:
FAA Terminal Area Forecast (TAF) Worksheet

Airport Master Plan Update

Aurora State Airport

WHPacific
OREGON DEPARTMENT OF AVIATION

Comparison of Airport Planning and FAA TAF Forecasts

AIRPORT NAME/LOCATION ID: **Aurora State Airport / UAO**
Date: **8/27/2010**

	Year	Airport Forecast	FAA TAF	AF/TAF (% Difference)
Passenger Enplanements				
Base yr.	2010	0	0	#DIV/0!
Base yr. + 5yrs.	2015	0	0	#DIV/0!
Base yr. + 10yrs.	2020	0	0	#DIV/0!
Base yr. + 15yrs.	2025	0	0	#DIV/0!
Commercial Operations				
Base yr.	2010	11,025	9,920	11.1%
Base yr. + 5yrs.	2015	11,795	10,579	11.5%
Base yr. + 10yrs.	2020	12,619	11,237	12.3%
Base yr. + 15yrs.	2025	13,501	11,896	13.5%
Total Operations				
Base yr.	2010	100,224	91,645	9.4%
Base yr. + 5yrs.	2015	107,227	102,396	4.7%
Base yr. + 10yrs.	2020	114,720	113,144	1.4%
Base yr. + 15yrs.	2025	122,736	123,895	-0.9%

NOTE: TAF data is on a U.S. Government fiscal year basis

Summary of Documention for Airport Planning Forecast

AIRPORT NAME/LOCATION ID: **Aurora State Airport / UAO**
Date: **8/27/2010**

A. Forecast Levels and Growth Rates

Base year: **2010**

	2010	2011	2015	2020	2025	Average Annual Compound Growth Rates 2011	2015	2020	2025
Passenger Enplanements									
Air Carrier	0	0	0	0	0	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Commuter	0	0	0	0	0	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
TOTAL	**0**	**0**	**0**	**0**	**0**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**
Operations									
Itinerant									
Air carrier	0	0	0	0	0	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Commuter/air taxi	11,025	11,175	11,795	12,619	13,501	1.4%	1.4%	1.4%	1.4%
Total Commercial Operations	**11,025**	**11,175**	**11,795**	**12,619**	**13,501**	**1.4%**	**1.4%**	**1.4%**	**1.4%**
General aviation	53,370	54,097	57,109	61,110	65,391	1.4%	1.4%	1.4%	1.4%
Military	250	250	250	250	250	0.0%	0.0%	0.0%	0.0%
Local									
General aviation	35,580	36,065	38,073	40,740	43,594	1.4%	1.4%	1.4%	1.4%
Military	0	0	0	0	0	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
TOTAL OPERATIONS	**100,224**	**101,587**	**107,227**	**114,720**	**122,736**	**1.4%**	**1.4%**	**1.4%**	**1.4%**
Instrument Operations	6,013	6,298	7,506	9,178	10,432	4.7%	4.5%	4.3%	3.7%
Peak Hour Operations	40	40	43	46	49	0.0%	1.5%	1.4%	1.4%
Cargo/mail (enplaned+deplaned tons)	0	0	0	0	0	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Based Aircraft									
Single Engine (Nonjet)	312	316	333	344	360	1.3%	1.3%	1.0%	1.0%
Multi Engine (Nonjet)	40	40	40	41	43	0.0%	0.0%	0.2%	0.5%
Jet Engine (Turbofan & Turboprop)	40	41	50	59	70	2.5%	4.6%	4.0%	3.8%
Helicopter	35	36	37	45	51	2.9%	1.1%	2.5%	2.5%
Other	5	5	5	5	5	0.0%	0.0%	0.0%	0.0%
TOTAL	**432**	**438**	**465**	**494**	**529**	**1.4%**	**1.5%**	**1.3%**	**1.4%**

B. Operational Factors

	2010	2011	2015	2020	2025
Average aircraft size (seats)					
Air carrier	0.0	0.0	0.0	0.0	0.0
Commuter	0.0	0.0	0.0	0.0	0.0
Average enplaning load factor					
Air carrier	0.0%	0.0%	0.0%	0.0%	0.0%
Commuter	0.0%	0.0%	0.0%	0.0%	0.0%
GA operations per based aircraft	**206**	**206**	**205**	**206**	**206**

Note: Show base plus one year if forecast was done.
If planning effort did not include all forecast years shown interpolate years as needed, using average annual compound growth rates.

Appendix I:
RUNWAY LENGTH SURVEY

Airport Master Plan Update

Aurora State Airport

Oregon
Theodore R. Kulongoski, Governor

OREGON DEPARTMENT OF AVIATION

3040 25th Street SE ♦ Salem, OR 97302-1125
Phone: (503) 378-4880 ♦ Toll Free: (800) 874-0102
Fax : (503) 373-1688

Aurora State Airport Runway Length Questionnaire

1. Please list the aircraft currently operated by your company into the Aurora State Airport, along with the aircraft's tail number:
   PC-12NG N811DD
   LR-45 N75XP
2. What is the typical stage length for each of the aircraft listed above?
   PC-12 - 800 nm
   LR-45 - 1600 nm
3. What is the maximum stage length for each of the aircraft listed above?
   PC-12 1200 nm
   LR45 - 2100 nm
4. If aircraft operations at the Aurora State Airport are constrained (i.e., reduced payload for takeoff), identify those constraints:
   runway not long enough on hot days
   traffic congestion - safety issues
5. Identify the number of annual operations at the Aurora State Airport that require a runway extension (this can be a cumulative number based on constrained operations of multiple aircraft, if you have a fleet of various aircraft): 30-40
6. Does your insurance company require a minimum runway length for operations? ___ Yes X No
   a. If you responded Yes to #6, please provide a letter from your insurance company stating the minimum runway length requirement.
7. Do you currently operate at the Aurora State Airport? X Yes ___ No
   a. If you responded No to #7, can you assure that your company intends on operating at the Aurora State Airport, if a runway extension that meets your criteria is constructed?
   ___ Yes ___ No
8. Are there any other comments/suggestions you have for improving the Aurora State Airport?
   Control tower

Optional - Please provide your contact information, in the event we have follow-up questions for you:
Name: Bill Grabewich Company: Premier - Air
Phone: 503 880 3254 E-Mail: premier-air@comcast.net

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Aurora State Airport Runway Length Questionnaire

1. Please list the aircraft currently operated by your company into the Aurora State Airport, along with the aircraft's tail number:
   CE-560 XL N567MC , PC-12/47E N52MW
   C-172 N943SP

2. What is the typical stage length for each of the aircraft listed above? NM = Nautical Miles SM = Statute Miles
   CE560 XL - 1800 NM (2071 SM)
   PC-12 800 NM (920 SM)

3. What is the maximum stage length for each of the aircraft listed above?
   CE 560 XL 1900 NM
   PC-12 1500 NM

4. If aircraft operations at the Aurora State Airport are constrained (i.e., reduced payload for takeoff), identify those constraints:
   During the summer on Hot days we are limited to less than a full gross weight take off because of too short of a runway. Also, Winter months cause us to operate out of Portland, OR because of runway too short.

5. Identify the number of annual operations at the Aurora State Airport that require a runway extension (this can be a cumulative number based on constrained operations of multiple aircraft, if you have a fleet of various aircraft):
   40 operations combined

6. Does your insurance company require a minimum runway length for operations? ____ Yes X No

   a. If you responded Yes to #6, please provide a letter from your insurance company stating the minimum runway length requirement.

7. Do you currently operate at the Aurora State Airport? X Yes ____ No

   a. If you responded No to #7, can you assure that your company intends on operating at the Aurora State Airport, if a runway extension that meets your criteria is constructed?
   ____ Yes ____ No

8. Are there any other comments/suggestions you have for improving the Aurora State Airport?
   #1, install a control tower, #2 lengthen runway to 6500 ft. #3, install an ILS precision approach.

   Please don't hesitate to contact me with any questions.

Optional - Please provide your contact information, in the event we have follow-up questions for you:
Name: Larry Brons - Chief Pilot Company: Management West
Phone: 503-678-1090 E-Mail: Larry@managementwest.com

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Fax: (503) 373-1688

Aurora State Airport Runway Length Questionnaire

1. Please list the aircraft currently operated by your company into the Aurora State Airport, along with the aircraft's tail number:
   CJ3 N149WW

2. What is the typical stage length for each of the aircraft listed above?
   400 NM

3. What is the maximum stage length for each of the aircraft listed above?
   1,800 NM

4. If aircraft operations at the Aurora State Airport are constrained (i.e., reduced payload for takeoff), identify those constraints:
   During hot summer days we have to take less fuel and at times incurre a fuel stop.

5. Identify the number of annual operations at the Aurora State Airport that require a runway extension (this can be a cumulative number based on constrained operations of multiple aircraft, if you have a fleet of various aircraft): 7

6. Does your insurance company require a minimum runway length for operations? ____ Yes X No

   a. If you responded Yes to #6, please provide a letter from your insurance company stating the minimum runway length requirement.

7. Do you currently operate at the Aurora State Airport? X Yes ____ No

   a. If you responded No to #7, can you assure that your company intends on operating at the Aurora State Airport, if a runway extension that meets your criteria is constructed?
   ____ Yes ____ No

8. Are there any other comments/suggestions you have for improving the Aurora State Airport?
   My company is considering buying a larger aircraft that would benefit significantly from having a longer runway

Optional - Please provide your contact information, in the event we have follow-up questions for you:

Name: Manny Martinez
Company: JHRD Investments
Phone: 503-957-4891
E-Mail: FIRSTCLASSCJ@msn.com

Oregon

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Aurora State Airport Runway Length Questionnaire

1. Please list the aircraft currently operated by your company into the Aurora State Airport, along with the aircraft's tail number:
   Cessna Citation CE-650 N896RJ

2. What is the typical stage length for each of the aircraft listed above?
   900 + miles

3. What is the maximum stage length for each of the aircraft listed above?
   1500 N.M. if conditions are perfect at Aurora. In summer we cannot takeoff full fuel & Pax.

4. If aircraft operations at the Aurora State Airport are constrained (i.e., reduced payload for takeoff), identify those constraints:
   We are currently limited on take off weight due to runway length. This is especially critical in summer.

5. Identify the number of annual operations at the Aurora State Airport that require a runway extension (this can be a cumulative number based on constrained operations of multiple aircraft, if you have a fleet of various aircraft):
   30 +

6. Does your insurance company require a minimum runway length for operations? ____ Yes __X__ No

   a. If you responded Yes to #6, please provide a letter from your insurance company stating the minimum runway length requirement.

7. Do you currently operate at the Aurora State Airport? __X__ Yes ____ No

   a. If you responded No to #7, can you assure that your company intends on operating at the Aurora State Airport, if a runway extension that meets your criteria is constructed?
   ____ Yes ____ No

8. Are there any other comments/suggestions you have for improving the Aurora State Airport?
   Our current aircraft is limited due to current runway length. We are changing aircraft to a larger model. The new model will be restricted more than the current aircraft. We would be able to operate safely with full fuel at a 7000' runway.

Optional - Please provide your contact information, in the event we have follow-up questions for you:

Name: Tod Coombs — Company: RJ2 / 08 Aviation
Phone: 503-358-0678 — E-Mail: tcoombs2@msn.com

Please contact me to discuss.

Lucas, Sarah

From: tod coombs [tcoombs2@msn.com]
Sent: Wednesday, August 18, 2010 7:42 PM
To: Lucas, Sarah
Subject: Re: Aurora State Airport

Follow Up Flag: Follow up
Flag Status: Flagged

Hi Sarah,

We are looking at a Citation X. We need to go non-stop to the east coast and Bahamas.
We are currently restricted with our current aircraft due to runway length requirements being to short for fuel loads required for the long trips.
When we get the Citation X, we will be more restricted. This of course means wasted time for fuel stops and extra costs involved.
During the summer months we cannot take off from Aurora without making a fuel stop for any trip over two hours.
We conduct on average 12-15 operations per month. Figure about 150-175 operation as a minimum per year.
I hope this information helps. If you need anything else from me, just let me know.
Thank-you,
Tod Coombs

----- Original Message -----
From: Lucas, Sarah
To: tcoombs2@msn.com
Sent: Monday, August 16, 2010 11:36 PM
Subject: Aurora State Airport

Mr. Coombs,

I am writing this email as a follow-up to a survey you completed for the Aurora State Airport Master Plan Update last winter regarding runway length. Due to financial constraints the project was put on hold, but now we are proceeding once again.

In the survey response you mention that you are currently constrained in your operations at UAO, but that constrained operations would be increasing as the company intends to purchase a more demanding aircraft. What type of aircraft is it that you are looking to purchase? What is your estimate for future constraints with this new aircraft? Also, you mention that current constrained operations are 30+: how many total operations per year do you conduct at UAO?

If you could assist me with these follow-up questions I would be greatly appreciative.

If you have any questions, please do not hesitate to contact me.

Oregon
Theodore R. Kulongoski, Governor

OREGON DEPARTMENT OF AVIATION

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Fax : (503) 373-1688

Aurora State Airport Runway Length Questionnaire

1. Please list the aircraft currently operated by your company into the Aurora State Airport, along with the aircraft's tail number: ASTRA JET | N41AL

2. What is the typical stage length for each of the aircraft listed above? 6000 feet of Runway, TRIPS OF 500-2000 N.M.

3. What is the maximum stage length for each of the aircraft listed above? 2500 N.M.

4. If aircraft operations at the Aurora State Airport are constrained (i.e., reduced payload for takeoff), identify those constraints: ON OCCASION I would need to take more fuel to Be able to Fly nonstop, however, the Runway is too short for Full Fuel & payload.

5. Identify the number of annual operations at the Aurora State Airport that require a runway extension (this can be a cumulative number based on constrained operations of multiple aircraft, if you have a fleet of various aircraft): 50 Take OFFS & Landings

6. Does your insurance company require a minimum runway length for operations? ____ Yes X No

   a. If you responded Yes to #6, please provide a letter from your insurance company stating the minimum runway length requirement.

7. Do you currently operate at the Aurora State Airport? X Yes ____ No

   a. If you responded No to #7, can you assure that your company intends on operating at the Aurora State Airport, if a runway extension that meets your criteria is constructed?
   X Yes ____ No

8. Are there any other comments/suggestions you have for improving the Aurora State Airport? LONGER RUNWAY By at least 1000 feet. 1500 feet would Be ideal.

   With increasing traffic a control tower would be a great addition!

Optional - Please provide your contact information, in the event we have follow-up questions for you:

Name: Michall Bony
Company: Novellus Systems Inc.
Phone: 408-781-5191
E-Mail: michall.bony@novellus.com

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Aurora State Airport Runway Length Questionnaire

1. Please list the aircraft currently operated by your company into the Aurora State Airport, along with the aircraft's tail number:
   __N900TG___Falcon900B_____

2. What is the typical stage length for each of the aircraft listed above? _____Average 1500miles._____

3. What is the maximum stage length for each of the aircraft listed above? _____3400 miles_____

4. If aircraft operations at the Aurora State Airport are constrained (i.e., reduced payload for takeoff), identify those constraints: ____Reduced payload for longer flights. We have a 46,500 lb max takeoff weight. Limited to 45,000 dual wheel weight restriction for runway. We also run into performance issues at the higher weights with runway length. An extra 1000 ft would help our operation. _____

5. Identify the number of annual operations at the Aurora State Airport that require a runway extension (this can be a cumulative number based on constrained operations of multiple aircraft, if you have a fleet of various aircraft):
   _____5_____

6. Does your insurance company require a minimum runway length for operations? ____ Yes __x__ No

   a. If you responded Yes to #6, please provide a letter from your insurance company stating the minimum runway length requirement.

7. Do you currently operate at the Aurora State Airport? _x___ Yes ____ No

   a. If you responded No to #7, can you assure that your company intends on operating at the Aurora State Airport, if a runway extension that meets your criteria is constructed?
      ____ Yes ____ No

8. Are there any other comments/suggestions you have for improving the Aurora State Airport?
   _____We are for the Control Tower for safety management with the increase in operations particularly with the growing number of larger jet aircraft.
   _____
   _____

Optional - Please provide your contact information, in the event we have follow-up questions for you:
Name: ____Marlin Dumler_____ Company: ____CSIM LLC___
Phone: _____503-516-5857_____ E-Mail: _____marlin@ csimllc.com_____

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By

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Phone: (503) 378-4880 ♦ Toll Free: (800) 874-0102
Fax : (503) 373-1688

Aurora State Airport Runway Length Questionnaire

1. Please list the aircraft currently operated by your company into the Aurora State Airport, along with the aircraft's tail number:
   IAI ASTRA N777AM, CIRRUS N769PC

2. What is the typical stage length for each of the aircraft listed above?
   1.0 HOUR, 0.7 HOURS

3. What is the maximum stage length for each of the aircraft listed above?
   4.5 HOURS, 2.5 HOURS

4. If aircraft operations at the Aurora State Airport are constrained (i.e., reduced payload for takeoff), identify those constraints:
   REDUCED PAYLOAD FOR T/O AND LDG

5. Identify the number of annual operations at the Aurora State Airport that require a runway extension (this can be a cumulative number based on constrained operations of multiple aircraft, if you have a fleet of various aircraft):
   15-20 DEPARTURES ANNUALLY

6. Does your insurance company require a minimum runway length for operations? ___ Yes [X] No

   a. If you responded Yes to #6, please provide a letter from your insurance company stating the minimum runway length requirement.

7. Do you currently operate at the Aurora State Airport? [X] Yes ___ No

   a. If you responded No to #7, can you assure that your company intends on operating at the Aurora State Airport, if a runway extension that meets your criteria is constructed?
   ___ Yes ___ No

8. Are there any other comments/suggestions you have for improving the Aurora State Airport?
   OUR COMPANY HEADQUARTERS ARE IN WILSONVILLE. WE ROUTINELY DEPART WITH 6-8 PASSENGERS, ESPECIALLY IN SUMMER. WE PURCHASE ALOT OF FUEL @ AURORA AND ARE LIMITED BY RUNWAY LENGTH FOR MANY DEPARTURES - ESPECIALLY IN SUMMER MONTHS.

Optional - Please provide your contact information, in the event we have follow-up questions for you:

Name: GENE MOBLEY
Company: AMERICAN MEDICAL CONCEPTS, INC.
Phone: 541-968-2140
E-Mail: [redacted]
GENE.MOBLEY@AMCMEDICAL.COM

Oregon
Theodore R. Kulongoski, Governor

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Fax : (503) 373-1688

Aurora State Airport Runway Length Questionnaire

1. Please list the aircraft currently operated by your company into the Aurora State Airport, along with the aircraft's tail number: ___Hawker 800A N508MM (currently registered in Mexico) Pilatus PC-12 N535PT & Beech A36 N349RP_____

2. What is the typical stage length for each of the aircraft listed above? ___800 NM, 400 NM, & 60 NM_____

3. What is the maximum stage length for each of the aircraft listed above? __2000 NM, 1500 NM, & 700 NM_____

4. If aircraft operations at the Aurora State Airport are constrained (i.e., reduced payload for takeoff), identify those constraints: ___Hawker reduced payload (fuel) for takeoff_____

5. Identify the number of annual operations at the Aurora State Airport that require a runway extension (this can be a cumulative number based on constrained operations of multiple aircraft, if you have a fleet of various aircraft):
_____120_____

6. Does your insurance company require a minimum runway length for operations?*__X__ Yes __X__ No
*Not specifically, but it does (as I believe most do) require safe & legal operations which includes balance field lengths.
   a. If you responded Yes to #6, please provide a letter from your insurance company stating the minimum runway length requirement.

7. Do you currently operate at the Aurora State Airport? __X__ Yes ____ No

   a. If you responded No to #7, can you assure that your company intends on operating at the Aurora State Airport, if a runway extension that meets your criteria is constructed?
   __X__ Yes ____ No

8. Are there any other comments/suggestions you have for improving the Aurora State Airport?

___The transient parking/ramp area on the state ramp (adjacent A2) needs work i.e. paving / seal-coating and better lighting_____

Optional - Please provide your contact information, in the event we have follow-up questions for you:
Name: __Bill Corn___ Company: _____W.A.C. Charter_____
Phone: ____503-979-7499____ E-Mail: _____

Oregon
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Aurora State Airport Runway Length Questionnaire

1. Please list the aircraft currently operated by your company into the Aurora State Airport, along with the aircraft's tail number:
   EMB-135BJ AC90, AC95 LR-35A, CL-601-3A/R
   N53NA, N543LG, N544LG, N115WF, N71AR, N83WA

2. What is the typical stage length for each of the aircraft listed above?
   EMB - 3400, AC90 = N/A, AC95 = N/A, LR-35A = 3300, CL601 = 4000
   (ALL NUMBERS ARE ESTIMATES)

3. What is the maximum stage length for each of the aircraft listed above?
   EMB = 7600 AC90 = N/A AC95 = N/A, LR-35A = 8300, CL601 = 9000
   (ALL NUMBERS ARE ESTIMATES)

4. If aircraft operations at the Aurora State Airport are constrained (i.e., reduced payload for takeoff), identify those constraints:
   ~~N/A~~ DURING SUMMER MONTHS NO JET CAN TAKE OFF UNDER 135 REQUIREMENTS WITH FULL PAYLOAD / FUEL

5. Identify the number of annual operations at the Aurora State Airport that require a runway extension (this can be a cumulative number based on constrained operations of multiple aircraft, if you have a fleet of various aircraft):
   BEST GUESS: ≈ 50 / YEAR

6. Does your insurance company require a minimum runway length for operations? ____ Yes ✓ No

   a. If you responded Yes to #6, please provide a letter from your insurance company stating the minimum runway length requirement.

7. Do you currently operate at the Aurora State Airport? ✓ Yes ____ No

   a. If you responded No to #7, can you assure that your company intends on operating at the Aurora State Airport, if a runway extension that meets your criteria is constructed?
   ____ Yes ____ No

8. Are there any other comments/suggestions you have for improving the Aurora State Airport?
   UPDATED TAXIWAY MARKINGS.

Optional - Please provide your contact information, in the event we have follow-up questions for you:

Name: VINCE HAMBLIN
Company: ACCO AIR, LLC.
Phone: 503-640-3711
E-Mail: VHAMBLIN@ACCOAIR.COM

Oregon
Theodore R. Kulongoski, Governor

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Aurora State Airport Runway Length Questionnaire

1. Please list the aircraft currently operated by your company into the Aurora State Airport, along with the aircraft's tail number: Global Express (N724AF), Gulfstream V (N531AF) and Twin Otter (N711AF)

2. What is the typical stage length for each of the aircraft listed above? Global Express – 4500NM, GV – 4500NM and Twin Otter – 100NM

3. What is the maximum stage length for each of the aircraft listed above? Global Express -- 6200NM, GV – 6500NM and Twin Otter – 300NM

4. If aircraft operations at the Aurora State Airport are constrained (i.e., reduced payload for takeoff), identify those constraints: In the two larger aircraft, we are constrained by maximum takeoff weight and could also be constrained by runway length if a higher weight were allowed

5. Identify the number of annual operations at the Aurora State Airport that require a runway extension (this can be a cumulative number based on constrained operations of multiple aircraft, if you have a fleet of various aircraft):
   4-5 Operations

6. Does your insurance company require a minimum runway length for operations? ____ Yes _X_ No

   a. If you responded Yes to #6, please provide a letter from your insurance company stating the minimum runway length requirement.

7. Do you currently operate at the Aurora State Airport? __X__ Yes ____ No

   a. If you responded No to #7, can you assure that your company intends on operating at the Aurora State Airport, if a runway extension that meets your criteria is constructed?
   ____ Yes ____ No

8. Are there any other comments/suggestions you have for improving the Aurora State Airport?

Optional - Please provide your contact information, in the event we have follow-up questions for you:

Name: Bruce Dunton Company: Vulcan Flight
Phone: (206) 658-4928 E-Mail: bruced@vulcan.com

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OREGON DEPARTMENT OF AVIATION

3040 25th Street SE ♦ Salem, OR 97302-1125
Phone: (503) 378-4880 ♦ Toll Free: (800) 874-0102
Fax : (503) 373-1688

Aurora State Airport Runway Length Questionnaire

1. Please list the aircraft currently operated by your company into the Aurora State Airport, along with the aircraft's tail number: ___CL-604, CL-601, G200

2. What is the typical stage length for each of the aircraft listed above? __2 to 4 hours_____

3. What is the maximum stage length for each of the aircraft listed above? _____6 – 8 hours_____

4. If aircraft operations at the Aurora State Airport are constrained (i.e., reduced payload for takeoff), identify those constraints: __reduced passenger load due to runway length, possible diversion upon arrival if rain due to runway lenght_____

5. Identify the number of annual operations at the Aurora State Airport that require a runway extension (this can be a cumulative number based on constrained operations of multiple aircraft, if you have a fleet of various aircraft):
___once a month_____

6. Does your insurance company require a minimum runway length for operations? ____ Yes _X___ No

    a. If you responded Yes to #6, please provide a letter from your insurance company stating the minimum runway length requirement.

7. Do you currently operate at the Aurora State Airport? _X___ Yes ____ No

    a. If you responded No to #7, can you assure that your company intends on operating at the Aurora State Airport, if a runway extension that meets your criteria is constructed?
    ____ Yes ____ No

8. Are there any other comments/suggestions you have for improving the Aurora State Airport?
___Our policy manual and me the director of operations make restrictions that apply to this shorter type runway. It also is very hard to plan for our executives since we never know if we can land in UAO since the possibility of rain is high in Oregon. If we arrive into that area and the runway is wet we would have to divert to PDX costing our passenegr a major delay and possible missing the meetings they are flying out there for. One event like that and my orders will be never to fly into there again. I know it sounds odd, but if I plan the drive from PDX then the passneger will not miss the meeting. Don't forget, the type passneger that is on this airplane "IS" the reason for the meeting and many people are awaiting her arrival.__DON'T FORGET THE MAIN REASON YOU SHOULD DO THIS IS FOR INCREASED SAFETY MARGIN FOR ALL!

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Aurora State Airport Runway Length Questionnaire

1. Please list the aircraft currently operated by your company into the Aurora State Airport, along with the aircraft's tail number:
   Our company currently does not operate from KUAO.
   We do however occassionly operate from KHIO, KADX and KMFR
   GLOBAL EXPRESS, N881WT and GULFSTREAM 550, N885WT
2. What is the typical stage length for each of the aircraft listed above?
   4500 NM
3. What is the maximum stage length for each of the aircraft listed above?
   N881WT 5700 NM
   N885WT 6100 NM
4. If aircraft operations at the Aurora State Airport are constrained (i.e., reduced payload for takeoff), identify those constraints:
   Fuel limited by maximum Takeoff weight allowable at KUAO
5. Identify the number of annual operations at the Aurora State Airport that require a runway extension (this can be a cumulative number based on constrained operations of multiple aircraft, if you have a fleet of various aircraft):
   We currently do not operate from KUAO due to location and runway length.
6. Does your insurance company require a minimum runway length for operations? ____ Yes X No
   a. If you responded Yes to #6, please provide a letter from your insurance company stating the minimum runway length requirement.
7. Do you currently operate at the Aurora State Airport? ____ Yes X No
   a. If you responded No to #7, can you assure that your company intends on operating at the Aurora State Airport, if a runway extension that meets your criteria is constructed?
   ____ Yes ____ No Not yet considered. Would have to evaluate.
8. Are there any other comments/suggestions you have for improving the Aurora State Airport?
   Our flight department has never operated from Aurora State Arpt.
   If the runway extension were to equal or exceed the KHIO runway 12/30
   facility, we would possibly consider operations from KUAO
   occassionally.

Optional - Please provide your contact information, in the event we have follow-up questions for you:

Name: Charles Reeves
Company: QUALCOMM
Phone: 858 525 2331
E-Mail: creeves@qualcomm.com

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Aurora State Airport Runway Length Questionnaire

1. Please list the aircraft currently operated by your company into the Aurora State Airport, along with the aircraft's tail number:
   N A

2. What is the typical stage length for each of the aircraft listed above?
   N A

3. What is the maximum stage length for each of the aircraft listed above?
   N A

4. If aircraft operations at the Aurora State Airport are constrained (i.e., reduced payload for takeoff), identify those constraints:
   N A

5. Identify the number of annual operations at the Aurora State Airport that require a runway extension (this can be a cumulative number based on constrained operations of multiple aircraft, if you have a fleet of various aircraft):
   N A

6. Does your insurance company require a minimum runway length for operations? ____ Yes __X__ No

   a. If you responded Yes to #6, please provide a letter from your insurance company stating the minimum runway length requirement.

7. Do you currently operate at the Aurora State Airport? ____ Yes __X__ No

   a. If you responded No to #7, can you assure that your company intends on operating at the Aurora State Airport, if a runway extension that meets your criteria is constructed?
   ____ Yes ____ No

8. Are there any other comments/suggestions you have for improving the Aurora State Airport?

Optional - Please provide your contact information, in the event we have follow-up questions for you:

Name: R. Hopkins Company: D+D Aviation
Phone: 801 532 0990 E-Mail:

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Aurora State Airport Runway Length Questionnaire

1. Please list the aircraft currently operated by your company into the Aurora State Airport, along with the aircraft's tail number:
   PC-12/47E N812GS
   PC-12/47E N812FS

2. What is the typical stage length for each of the aircraft listed above?
   Typical flight length is 800 miles.

3. What is the maximum stage length for each of the aircraft listed above?
   Maximum length is 1500 miles

4. If aircraft operations at the Aurora State Airport are constrained (i.e., reduced payload for takeoff), identify those constraints:
   No constraints.

5. Identify the number of annual operations at the Aurora State Airport that require a runway extension (this can be a cumulative number based on constrained operations of multiple aircraft, if you have a fleet of various aircraft):
   0

6. Does your insurance company require a minimum runway length for operations? ____ Yes X No

   a. If you responded Yes to #6, please provide a letter from your insurance company stating the minimum runway length requirement.

7. Do you currently operate at the Aurora State Airport? X Yes ____ No

   a. If you responded No to #7, can you assure that your company intends on operating at the Aurora State Airport, if a runway extension that meets your criteria is constructed?
   X Yes ____ No

8. Are there any other comments/suggestions you have for improving the Aurora State Airport?
   In the vicinity of Hangar K we need a wider taxi way. Recent hangar construction has caused a chock point and no place to stage aircraft.

Optional - Please provide your contact information, in the event we have follow-up questions for you:

Name: Greg Lund
Company: FLIR Systems
Phone: 503-593-2727
E-Mail: greg.lund@flir.com

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Aurora State Airport Runway Length Questionnaire

1. Please list the aircraft currently operated by your company into the Aurora State Airport, along with the aircraft's tail number:
   CITATION XL
2. What is the typical stage length for each of the aircraft listed above?
   200 MILES
3. What is the maximum stage length for each of the aircraft listed above?
   1600 MILES
4. If aircraft operations at the Aurora State Airport are constrained (i.e., reduced payload for takeoff), identify those constraints:
   N/A
5. Identify the number of annual operations at the Aurora State Airport that require a runway extension (this can be a cumulative number based on constrained operations of multiple aircraft, if you have a fleet of various aircraft):
   NONE.
6. Does your insurance company require a minimum runway length for operations? ____ Yes _X_ No
   a. If you responded Yes to #6, please provide a letter from your insurance company stating the minimum runway length requirement.
7. Do you currently operate at the Aurora State Airport? _X_ Yes ____ No
   a. If you responded No to #7, can you assure that your company intends on operating at the Aurora State Airport, if a runway extension that meets your criteria is constructed?
   _X_ Yes ____ No
8. Are there any other comments/suggestions you have for improving the Aurora State Airport?
   WE ARE HAPPY WITH UAO AND PLAN TO BE HERE FOR MANY YEARS.

Optional - Please provide your contact information, in the event we have follow-up questions for you:

Name: RICH WARDEN
Company: RSG FOREST PRODUCTS
Phone: 678-1475
E-Mail:

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Aurora State Airport Runway Length Questionnaire

1. Please list the aircraft currently operated by your company into the Aurora State Airport, along with the aircraft's tail number: ____C-152 N64942, C-172(s) N172JV & N2457X, PA-28R N425JV, C-421(s) N513SJ, N2668A & N700MR, BE-200B N411KC_____

2. What is the typical stage length for each of the aircraft listed above? ___40 NM, 60 NM, 110 NM, 200 NM, and 250 NM_____

3. What is the maximum stage length for each of the aircraft listed above? ____240 NM, 450 NM, 600 NM, 950 NM and 1200 NM_____

4. If aircraft operations at the Aurora State Airport are constrained (i.e., reduced payload for takeoff), identify those constraints: ____Yes, but not currently (see below)_____

5. Identify the number of annual operations at the Aurora State Airport that require a runway extension (this can be a cumulative number based on constrained operations of multiple aircraft, if you have a fleet of various aircraft):
_____Approx. 500 (See below)_____

6. Does your insurance company require a minimum runway length for operations? __X__ Yes ____ No

    a. If you responded Yes to #6, please provide a letter from your insurance company stating the minimum runway length requirement. Our Policy is voluminous but requires a balanced field length.

7. Do you currently operate at the Aurora State Airport? __X__ Yes ____ No

    a. If you responded No to #7, can you assure that your company intends on operating at the Aurora State Airport, if a runway extension that meets your criteria is constructed? __X__ Yes ____ No

8. Are there any other comments/suggestions you have for improving the Aurora State Airport?
___We have operated off here since 1968 including Commercial Air-Carrier ("on call –charter under FAR 135) since 1980, from 2003 to 2007 this included Jet Charter (RA-390, BE-400, HS-125 & DA-900) which was constantly limited by runway length, resumption of this service would be expedited by an improved runway. Our jet fuel sales are currently limited by runway length and strength.___

Optional - Please provide your contact information, in the event we have follow-up questions for you:
Name: __Bruce Bennett__ Company: ___Aurora Aviation, Inc._____
Phone: ____503-678-1217_____ E-Mail: _____Bruce@AuroraAviation.com_____

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Aurora State Airport Runway Length Questionnaire

1. Please list the aircraft currently operated by your company into the Aurora State Airport, along with the aircraft's tail number: We do not presently operate our Global Express into Aurora State Airport since it only has 5,000 foot runway. N823DF

2. What is the typical stage length for each of the aircraft listed above? 4,500 NM

3. What is the maximum stage length for each of the aircraft listed above? 5,900 NM

4. If aircraft operations at the Aurora State Airport are constrained (i.e., reduced payload for takeoff), identify those constraints: With the runway at its present length. We would not be able to depart Aurora State Airport with enough fuel to reach any destination in Europe or Asia. The minimum length would we would need would be 6,000 feet.

5. Identify the number of annual operations at the Aurora State Airport that require a runway extension (this can be a cumulative number based on constrained operations of multiple aircraft, if you have a fleet of various aircraft):
50

6. Does your insurance company require a minimum runway length for operations? ____ Yes __X__ No

   a. If you responded Yes to #6, please provide a letter from your insurance company stating the minimum runway length requirement.

7. Do you currently operate at the Aurora State Airport? ____ Yes __X__ No

   a. If you responded No to #7, can you assure that your company intends on operating at the Aurora State Airport, if a runway extension that meets your criteria is constructed?
   __X__ Yes ____ No

8. Are there any other comments/suggestions you have for improving the Aurora State Airport?

Optional - Please provide your contact information, in the event we have follow-up questions for you:

Name: Larry B Edeal
Company: Y2K Aviation LLC
Phone: 503 640 9518
E-Mail: ledeal@y2kaviationllc.com

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Aurora State Airport Runway Length Questionnaire

1. Please list the aircraft currently operated by your company into the Aurora State Airport, along with the aircraft's tail number:
ASTRA #034 N541RL TRANSCONTINENT INV. LLC.

2. What is the typical stage length for each of the aircraft listed above?
1000 - 2000

3. What is the maximum stage length for each of the aircraft listed above?
2400

4. If aircraft operations at the Aurora State Airport are constrained (i.e., reduced payload for takeoff), identify those constraints:
RUNWAY LENGTH DUE TO TEMP.

5. Identify the number of annual operations at the Aurora State Airport that require a runway extension (this can be a cumulative number based on constrained operations of multiple aircraft, if you have a fleet of various aircraft):
60-70 (SINGLE AIRCRAFT)

6. Does your insurance company require a minimum runway length for operations? ____ Yes ✓ No

   a. If you responded Yes to #6, please provide a letter from your insurance company stating the minimum runway length requirement.

7. Do you currently operate at the Aurora State Airport? ✓ Yes ____ No

   a. If you responded No to #7, can you assure that your company intends on operating at the Aurora State Airport, if a runway extension that meets your criteria is constructed?
   ✓ Yes ____ No

8. Are there any other comments/suggestions you have for improving the Aurora State Airport?
(1) CONTROL TOWER ASAP –
(2) RUNWAY EXTENSION –

Optional – Please provide your contact information, in the event we have follow-up questions for you.

Name: RENNY PRICE
Company: HAMMERHEAD AEROBATICS
Phone: 503-381-5564
E-Mail: RENNYPRICE@MSN.COM

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Aurora State Airport Runway Length Questionnaire

1. Please list the aircraft currently operated by your company into the Aurora State Airport, along with the aircraft's tail number:
Currently N/A due to runway length. We operate two Challengers - N601RC and 605RC as well as one Hawker 800XP - N800RC

2. What is the typical stage length for each of the aircraft listed above?
6000 NM each

3. What is the maximum stage length for each of the aircraft listed above?
N601RC - 3000 NM, N605RC - 4000 NM,
N800RC 2700 NM

4. If aircraft operations at the Aurora State Airport are constrained (i.e., reduced payload for takeoff), identify those constraints:
Reduced max T.O. weight resulting in additional fuel stop to return to destination (Essex). Unable to use when runway contaminated

5. Identify the number of annual operations at the Aurora State Airport that require a runway extension (this can be a cumulative number based on constrained operations of multiple aircraft, if you have a fleet of various aircraft):
If runway extended - would use 12-15 Times/year

6. Does your insurance company require a minimum runway length for operations? ____ Yes X No

   a. If you responded Yes to #6, please provide a letter from your insurance company stating the minimum runway length requirement.

7. Do you currently operate at the Aurora State Airport? ____ Yes X No

   a. If you responded No to #7, can you assure that your company intends on operating at the Aurora State Airport, if a runway extension that meets your criteria is constructed?
   X Yes ____ No

8. Are there any other comments/suggestions you have for improving the Aurora State Airport?

Optional - Please provide your contact information, in the event we have follow-up questions for you:

Name: Evan McBride Company: Rockwell Collins
Phone: 319-295-5221 E-Mail: emcbride@rockwellcollins.com

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Aurora State Airport Runway Length Questionnaire

1. Please list the aircraft currently operated by your company into the Aurora State Airport, along with the aircraft's tail number:
   A300F5 CL-30

2. What is the typical stage length for each of the aircraft listed above?
   600 nm

3. What is the maximum stage length for each of the aircraft listed above?
   2,200 nm

4. If aircraft operations at the Aurora State Airport are constrained (i.e., reduced payload for takeoff), identify those constraints:
   restricted operations on West Runway for departures

5. Identify the number of annual operations at the Aurora State Airport that require a runway extension (this can be a cumulative number based on constrained operations of multiple aircraft, if you have a fleet of various aircraft):
   6

6. Does your insurance company require a minimum runway length for operations? ✓ Yes ____ No

   a. If you responded Yes to #6, please provide a letter from your insurance company stating the minimum runway length requirement. Variable based on 90% scenario

7. Do you currently operate at the Aurora State Airport? ✓ Yes ____ No

   a. If you responded No to #7, can you assure that your company intends on operating at the Aurora State Airport, if a runway extension that meets your criteria is constructed?
   ✓ Yes ____ No

8. Are there any other comments/suggestions you have for improving the Aurora State Airport?
   We are unable to use 100 about 30% of the time due to runway restrictions

Optional - Please provide your contact information, in the event we have follow-up questions for you:

Name: Ken Doubet
Company: Kap Air
Phone: 206-913-1063
E-Mail: [illegible]

Replaces prior survey.

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Aurora State Airport Runway Length Questionnaire

1. Please list the aircraft currently operated by your company into the Aurora State Airport, along with the aircraft's tail number: ASTRAJET 1125 / N41AU

2. What is the typical stage length for each of the aircraft listed above?
800 N.M.

3. What is the maximum stage length for each of the aircraft listed above?
2200 N.M.

4. If aircraft operations at the Aurora State Airport are constrained (i.e., reduced payload for takeoff), identify those constraints:
Not able to top off Fuel & passengers for some mission Because we are Restricted for weight for Runway length!

5. Identify the number of annual operations at the Aurora State Airport that require a runway extension (this can be a cumulative number based on constrained operations of multiple aircraft, if you have a fleet of various aircraft).
48 take off / year average.

6. Does your insurance company require a minimum runway length for operations? ___ Yes X No

   a. If you responded Yes to #6, please provide a letter from your insurance company stating the minimum runway length requirement.

7. Do you currently operate at the Aurora State Airport? X Yes ___ No

   a. If you responded No to #7, can you assure that your company intends on operating at the Aurora State Airport, if a runway extension that meets your criteria is constructed?
   ___ Yes ___ No

8. Are there any other comments/suggestions you have for improving the Aurora State Airport?
LONGER RUNWAY WOULD BE MUCH APPRECIATED!

Optional - Please provide your contact information, in the event we have follow-up questions for you:

Name: MICHALL BONY
Company: Novellus Systems Inc.
Phone: 408-781-5191
E-Mail: michall.bony@novellus.com

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Aurora State Airport Runway Length Questionnaire

1. Please list the aircraft currently operated by your company into the Aurora State Airport, along with the aircraft's tail number:
   CE 560 N38NS

2. What is the typical stage length for each of the aircraft listed above?
   400 nm 2 hrs

3. What is the maximum stage length for each of the aircraft listed above?
   1680 nm 4.5 hrs

4. If aircraft operations at the Aurora State Airport are constrained (i.e., reduced payload for takeoff), identify those constraints:
   TEMP's ABOVE 35°C / WET

5. Identify the number of annual operations at the Aurora State Airport that require a runway extension (this can be a cumulative number based on constrained operations of multiple aircraft, if you have a fleet of various aircraft):
   10

6. Does your insurance company require a minimum runway length for operations? ____ Yes X No

   a. If you responded Yes to #6, please provide a letter from your insurance company stating the minimum runway length requirement.

7. Do you currently operate at the Aurora State Airport? X Yes ____ No

   a. If you responded No to #7, can you assure that your company intends on operating at the Aurora State Airport, if a runway extension that meets your criteria is constructed?
   ____ Yes ____ No

8. Are there any other comments/suggestions you have for improving the Aurora State Airport?
   ILS
   RWY EXTENSION 500' - 1000' FT
   TOWER

Optional - Please provide your contact information, in the event we have follow-up questions for you.

Name: ERNIE STURM
Company: AIRCRAFT MANAGEMENT SERVICES
Phone: 360-834-2211
E-Mail: estrum@aircraftmgt.com

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Aurora State Airport Runway Length Questionnaire

1. Please list the aircraft currently operated by your company into the Aurora State Airport, along with the aircraft's tail number:
   Hawker 800XP N650JS

2. What is the typical stage length for each of the aircraft listed above?
   500 nm 2-3 hrs

3. What is the maximum stage length for each of the aircraft listed above?
   2500 nm 6 hrs

4. If aircraft operations at the Aurora State Airport are constrained (i.e., reduced payload for takeoff), identify those constraints:
   TEMP ABOVE 20° C / WET

5. Identify the number of annual operations at the Aurora State Airport that require a runway extension (this can be a cumulative number based on constrained operations of multiple aircraft, if you have a fleet of various aircraft):
   12

6. Does your insurance company require a minimum runway length for operations? ____ Yes X No

   a. If you responded Yes to #6, please provide a letter from your insurance company stating the minimum runway length requirement.

7. Do you currently operate at the Aurora State Airport? X Yes ____ No

N/A a. If you responded No to #7, can you assure that your company intends on operating at the Aurora State Airport, if a runway extension that meets your criteria is constructed?
   ____ Yes ____ No

8. Are there any other comments/suggestions you have for improving the Aurora State Airport?
   Runway Extension
   ILS
   Tower

Optional - Please provide your contact information, in the event we have follow-up questions for you.

Name: Ernie Struss
Company: Aircraft Mechanic Solutions
Phone: 360-834-2211
E-Mail: estruss@aircraftmechanic.com

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Aurora State Airport Runway Length Questionnaire

1. Please list the aircraft currently operated by your company into the Aurora State Airport, along with the aircraft's tail number:
   FA/20 N987AB

2. What is the typical stage length for each of the aircraft listed above?
   2-5 hrs 500 nm

3. What is the maximum stage length for each of the aircraft listed above?
   4-5 hrs 1000 nm

4. If aircraft operations at the Aurora State Airport are constrained (i.e., reduced payload for takeoff), identify those constraints:
   TEMP's ABOVE 20°C / WET

5. Identify the number of annual operations at the Aurora State Airport that require a runway extension (this can be a cumulative number based on constrained operations of multiple aircraft, if you have a fleet of various aircraft):
   15

6. Does your insurance company require a minimum runway length for operations? X Yes X No

   a. If you responded Yes to #6, please provide a letter from your insurance company stating the minimum runway length requirement.

7. Do you currently operate at the Aurora State Airport? X Yes ____ No

N/A a. If you responded No to #7, can you assure that your company intends on operating at the Aurora State Airport, if a runway extension that meets your criteria is constructed?
   ____ Yes ____ No

8. Are there any other comments/suggestions you have for improving the Aurora State Airport?
   ILS
   EXTENDENDED RNWY 500' - 1000'
   TOWER

Optional - Please provide your contact information, in the event we have follow-up questions for you.

Name: ERNIE STURM Company: Aircraft Mount Solutions
Phone: 360-834-2211 E-Mail: esturm@aircraftmount.com

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Fax: 503-373-1688

Aurora State Airport Runway Length Questionnaire

1. Please list the aircraft currently operated by your company into the Aurora State Airport, along with the aircraft's tail number:
   N6780Q Beech A36

2. What is the typical stage length for each of the aircraft listed above?
   200 nm

3. What is the maximum stage length for each of the aircraft listed above?
   1000 nm

4. If aircraft operations at the Aurora State Airport are constrained (i.e., reduced payload for takeoff), identify those constraints:

5. Identify the number of annual operations at the Aurora State Airport that require a runway extension (this can be a cumulative number based on constrained operations of multiple aircraft, if you have a fleet of various aircraft):

6. Does your insurance company require a minimum runway length for operations? ____ Yes X No

   a. If you responded Yes to #6, please provide a letter from your insurance company stating the minimum runway length requirement.

7. Do you currently operate at the Aurora State Airport? X Yes ____ No

   a. If you responded No to #7, can you assure that your company intends on operating at the Aurora State Airport, if a runway extension that meets your criteria is constructed?
   ____ Yes ____ No

8. Are there any other comments/suggestions you have for improving the Aurora State Airport?
   Need a Control Tower; Several Near misses when entering or departing.

Optional - Please provide your contact information, in the event we have follow-up questions for you.

Name: Craig Stuckey
Company: Aircraft Management Solutions
Phone: 503 780 4151
E-Mail: CStuckey@aircraftmgmtsolutions.com

Oregon

Theodore R. Kulongoski, Governor

OREGON DEPARTMENT OF AVIATION

3040 25th Street SE • Salem, OR 97302-1125
Phone: 503-378-4880 • Toll Free: 800-874-0102
Fax: 503-373-1688

Aurora State Airport Runway Length Questionnaire

1. Please list the aircraft currently operated by your company into the Aurora State Airport, along with the aircraft's tail number:
   Hawker 800XP N800YY

2. What is the typical stage length for each of the aircraft listed above?
   500 - 1000 nm 3-4 hrs

3. What is the maximum stage length for each of the aircraft listed above?
   1500 nm 6 hrs

4. If aircraft operations at the Aurora State Airport are constrained (i.e., reduced payload for takeoff), identify those constraints:
   ~~TO~~ Temp Above 30°C / Wet

5. Identify the number of annual operations at the Aurora State Airport that require a runway extension (this can be a cumulative number based on constrained operations of multiple aircraft, if you have a fleet of various aircraft):
   12

6. Does your insurance company require a minimum runway length for operations? ____ Yes X No

   a. If you responded Yes to #6, please provide a letter from your insurance company stating the minimum runway length requirement.

7. Do you currently operate at the Aurora State Airport? X Yes ~~X~~ No

   a. If you responded No to #7, can you assure that your company intends on operating at the Aurora State Airport, if a runway extension that meets your criteria is constructed?
   ____ Yes ____ No

8. Are there any other comments/suggestions you have for improving the Aurora State Airport?
   ILS
   Tower
   Rnwy Ext 500 - 1000'

Optional - Please provide your contact information, in the event we have follow-up questions for you.

Name: Ernie Stuem Company: Aircraft Maint. Solutions
Phone: 360-834-2211 E-Mail: estuem@aircraftsol.com

Oregon

Theodore R. Kulongoski, Governor

OREGON DEPARTMENT OF AVIATION

3040 25th Street SE • Salem, OR 97302-1125
Phone: (503) 378-4880 • Toll Free: (800) 874-0102
Fax: (503) 373-1688

Aurora State Airport Runway Length Questionnaire

1. Please list the aircraft currently operated by your company into the Aurora State Airport, along with the aircraft's tail number: CJ3 – N417C

2. What is the typical stage length for each of the aircraft listed above? ___400 nm

3. What is the maximum stage length for each of the aircraft listed above? 1700 nm

4. If aircraft operations at the Aurora State Airport are constrained (i.e., reduced payload for takeoff), identify those constraints: Shortened runway would affect balanced field length, which would affect range and payload. Not good for us.

5. Identify the number of annual operations at the Aurora State Airport that require a runway extension (this can be a cumulative number based on constrained operations of multiple aircraft, if you have a fleet of various aircraft): For us, 2

6. Does your insurance company require a minimum runway length for operations? _____ Yes _X___ No

   a. If you responded Yes to #6, please provide a letter from your insurance company stating the minimum runway length requirement.

7. Do you currently operate at the Aurora State Airport? __X__ Yes _____ No

   a. If you responded No to #7, can you assure that your company intends on operating at the Aurora State Airport, if a runway extension that meets your criteria is constructed? __X__ Yes _____ No

8. Are there any other comments/suggestions you have for improving the Aurora State Airport? Not at this time

9.

10. provide your contact information, in the event we have follow-up questions for you:

Name: Jeffrey L. Glass_____ Company: Glass Aviation, Inc.
Phone: 408-292-3886 E-Mail: jglass@glassaviation.com

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OREGON DEPARTMENT OF AVIATION

3040 25th Street SE • Salem, OR 97302-1125
Phone: (503) 378-4880 • Toll Free: (800) 874-0102
Fax: (503) 373-1688

Aurora State Airport Runway Length Questionnaire

1. Please list the aircraft currently operated by your company into the Aurora State Airport, along with the aircraft's tail number: ___British Aerospace BAE 125 Series (Hawker) 800A N855BC_____

2. What is the typical stage length for each of the aircraft listed above? ___900 NM,_____

3. What is the maximum stage length for each of the aircraft listed above? __2000 NM, _____

4. If aircraft operations at the Aurora State Airport are constrained (i.e., reduced payload for takeoff), identify those constraints: ___ reduced payload (fuel, baggage or passengers) for takeoff due to runway length and balanced field safety requirements_____

5. Identify the number of annual operations at the Aurora State Airport that require a runway extension (this can be a cumulative number based on constrained operations of multiple aircraft, if you have a fleet of various aircraft):
   _____60/year_____

6. Does your insurance company require a minimum runway length for operations?*__X__ Yes ____ No
   *Not certain distance but does require legal operations which includes balance field lengths.
   a. If you responded Yes to #6, please provide a letter from your insurance company stating the minimum runway length requirement. (on request)

7. Do you currently operate at the Aurora State Airport? __X__ Yes ____ No

   a. If you responded No to #7, can you assure that your company intends on operating at the Aurora State Airport, if a runway extension that meets your criteria is constructed?
   __X__ Yes ____ No

8. Are there any other comments/suggestions you have for improving the Aurora State Airport?
   _____A Control Tower is very badly needed and the transient parking/ramp area on the state ramp (adjacent A2) needs work i.e. paving / seal-coating and better lighting_____

Optional - Please provide your contact information, in the event we have follow-up questions for you:
Name: __Bill Corn___ Company: _____PB Air Inc_____
Phone: _____503-979-7499_____ E-Mail: _____

Oregon

Theodore R. Kulongoski, Governor

OREGON DEPARTMENT OF AVIATION

3040 25th Street SE • Salem, OR 97302-1125
Phone: 503-378-4880 • Toll Free: 800-874-0102
Fax: 503-373-1688

Aurora State Airport Runway Length Questionnaire

1. Please list the aircraft currently operated by your company into the Aurora State Airport, along with the aircraft's tail number:
   N883HD, N707WR, N823HD, N884HD, N825HD
   FA-900, FA-900EX, FA-50, FA-50, FA-50

2. What is the typical stage length for each of the aircraft listed above?
   3-4 hours

3. What is the maximum stage length for each of the aircraft listed above?
   5 hours

4. If aircraft operations at the Aurora State Airport are constrained (i.e., reduced payload for takeoff), identify those constraints:

5. Identify the number of annual operations at the Aurora State Airport that require a runway extension (this can be a cumulative number based on constrained operations of multiple aircraft, if you have a fleet of various aircraft):
   4

6. Does your insurance company require a minimum runway length for operations? X Yes ____ No

   a. If you responded Yes to #6, please provide a letter from your insurance company stating the minimum runway length requirement.

7. Do you currently operate at the Aurora State Airport? X Yes ____ No

   a. If you responded No to #7, can you assure that your company intends on operating at the Aurora State Airport, if a runway extension that meets your criteria is constructed?
   X Yes ____ No

8. Are there any other comments/suggestions you have for improving the Aurora State Airport?

Optional - Please provide your contact information, in the event we have follow-up questions for you:

Name: Andrew Howard
Company: The Home Depot
Phone: 770-384-3837
E-Mail:

Oregon
Theodore R. Kulongoski, Governor

OREGON DEPARTMENT OF AVIATION

3040 25th Street SE • Salem, OR 97302-1125
Phone: (503) 378-4880 • Toll Free (800) 874-0102
Fax: (503) 373-1688

Aurora State Airport Runway Length Questionnaire

1. Please list the aircraft currently operated by your company into the Aurora State Airport, along with the aircraft's tail number: None because the runway is too short. We operate a Citation Encore. Jet N550PF

2. What is the typical stage length for each of the aircraft listed above? Hour and 30 min.

3. What is the maximum stage length for each of the aircraft listed above? Six hours

4. If aircraft operations at the Aurora State Airport are constrained (i.e., reduced payload for takeoff), identify those constraints. The runway is to short to even consider

5. Identify the number of annual operations at the Aurora State Airport that require a runway extension (this can be a cumulative number based on constrained operations of multiple aircraft, if you have a fleet of various aircraft): We would consider using it 10 times a year

6. Does your insurance company require a minimum runway length for operations? ____ Yes __X__ No

   a. If you responded Yes to #6, please provide a letter from your insurance company stating the minimum runway length requirement

7. Do you currently operate at the Aurora State Airport? ____ Yes __X__ No

   a. If you responded No to #7, can you assure that your company intends on operating at the Aurora State Airport, if a runway extension that meets your criteria is constructed?
   __X__ Yes ____ No

8. Are there any other comments/suggestions you have for improving the Aurora State Airport?
   Just make the runway longer

Optional - Please provide your contact information, in the event we have follow-up questions for you.

Name: Garry Pohrman Company: Adaptation Aviation LLC 3635 Alma Ave Redding, Ca 96002

Phone: 5309497614 Garry44@aol.com E-Mail:

Appendix J:
TRAFFIC ANALYSIS

Airport Master Plan Update

Aurora State Airport

WHPacific
OREGON DEPARTMENT OF AVIATION

Appendix J
TRAFFIC ANALYSIS

Contents

- Email memo from Don Crownover, ODOT, 11/15/10
- Transportation Development Division, TSM Unit, Aurora Airport Data Sheets
- Marion County, AADT data sheets
- Clackamas County, AADT data sheets
- Marion County, Rural road functional classification
- Marion County, Average daily traffic volume
- Marion County, Rural road functional classification characteristics
- Clackamas County, Functional classification guidelines
- Clackamas County, Access management plan, Appendix F
- Helicopter Transport Services, Transportation Impact Study excerpts, Mackenzie Group (2009)
- Fred Meyer, Transportation Impact Study excerpts, DKS associates (2008)

Anderson, Rainse

From: CROWNOVER Don R [Don.R.CROWNOVER@odot.state.or.us]
Sent: Wednesday, November 03, 2010 4:31 PM
To: Anderson, Rainse; CUMMINGS Christopher * ODA; WILSON John P * ODA
Subject: RE: Aurora airport counts [auto-ip][senderbase]

All; I applied factors to the counts to estimate a annual average daily traffic (AADT) at the sites. These should be taken with a great plus or minus. The AADT is derived by multiplying the count ADT by a seasonal factor by an axle factor. The count ADT is just the average from the seven days it was counted. The seasonal factor is just an adjustment based on our nearby Hubbard automatic traffic recorder (ATR) that is a ratio of that count week to the year (in this case a rolling year from Nov 2009 to Oct 2010, because 2010 is not yet complete. That factor was 0.97. The axle factor adjusts for the fact that the counter just sees every two axles as a vehicle. Since there were few trailers that we saw, I just applied an axle factor of 0.99. Since all that is such a long shot, I also rounded as much as I could get away with. The chart below presents the sites in clockwise order around the airport. If you have any questions, please let me know. Don

Site ID	Description	Count ADT	Estimated Annual ADT	Peak Hour
21127	Columbia North Exit	106	100	37
21165	Columbia North Entrance	142	140	50
21157	Columbia East Entrance	926	890	396
21187	Willamette Aviation	165	160	36
21122	Orange Entrance	75	70	15
21114	Blue Entrance	170	160	30
21160	Green Entrance	145	140	29
21159	Purple Entrance	137	130	33
21168	Yellow Entrance	306	290	39
21105	Van's Entrance	142	140	59
21119	Red Entrance	185	180	33
			2400	

Columbia (3) - 1130
Airport (8) - 1270
2400

HTS - keilrd 211
Peak 34 AM
36 PM

From: Anderson, Rainse [mailto:RAnderson@whpacific.com]
Sent: Friday, October 29, 2010 10:39 AM
To: CROWNOVER Don R; CUMMINGS Christopher * ODA; WILSON John P * ODA
Cc: Anderson, Rainse
Subject: RE: Aurora airport counts

Don,

Thanks for the data. Could you let me know what other reports you can provide....also I assume that these number are total axle counts so at a minimum they are one half of the total correct?

Thanks

Rainse
Rainse Anderson
Director of Aviation

Transportation Development Division - TSM Unit

Site Number:	21127	Site Name:	Columbia North Exit	Region:	2	Vehicle Type:	Vehicles	County:	Marion
Street Number:	0	Mile Point:		Start Date:	10/18/2010	Lane / Direction / Flow:	Combined		

ADT:	100	Avg Weekdays (Mon - Thu):	-	Avg Day:	106			
Max Hour:	37	Day:	Wed	Date:	10/20/2010	Hour:	18	
Max Day:	188	Day:	Tue	Date:	10/19/2010			

Sunday		Monday		Tuesday		Wednesday		Thursday		Friday		Saturday	
Date	Value	Date	Value	Date	Value	Date	Value	Date	Value	Date	Value	Date	Value
		10/18	-	10/19	188	10/20	157	10/21	140	10/22	151	10/23	00
10/24	01	10/25	-										
Avg:	1	Avg:	-	Avg:	188	Avg:	157	Avg:	140	Avg:	151	Avg:	0

Date	Day	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Total
10/18	Mon	-	-	-	-	-	-	-	-	-	-	-	-	-	5	6	5	28	33	0	0	0	0	0	0	77
10/19	Tue	0	0	0	0	0	1	8	27	3	3	4	29	14	13	4	1	32	35	0	13	1	0	0	0	188
10/20	Wed	0	0	0	0	0	1	6	20	0	0	4	29	13	5	5	1	36	37	0	0	0	0	0	0	157
10/21	Thu	0	0	0	0	0	2	5	28	2	4	3	20	10	4	16	2	28	16	0	0	0	0	0	0	140
10/22	Fri	0	0	0	0	0	1	4	17	2	1	3	31	28	7	2	14	28	13	0	0	0	0	0	0	151
10/23	Sat	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10/24	Sun	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
10/25	Mon	0	0	0	0	0	1	7	24	3	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	35

Transportation Development Division - TSM Unit

Site Number:	21165			Site Name:	Columbia North Ent			Region:	2			Vehicle Type:	Vehicles			County:	Marion								
Street Number:	0			Mile Point:				Start Date:	10/18/2010			Lane / Direction / Flow:	Combined												
	ADT:	140		Avg Weekdays (Mon - Thu):	-			Avg Day:	142																
	Max Hour:	50		Day:	Tue			Date:	10/19/2010			Hour:	8												
	Max Day:	242		Day:	Tue			Date:	10/19/2010																

Sunday		Monday		Tuesday		Wednesday		Thursday		Friday		Saturday	
Date	Value	Date	Value	Date	Value	Date	Value	Date	Value	Date	Value	Date	Value
		10/18	-	10/19	242	10/20	215	10/21	230	10/22	163	10/23	01
10/24	00	10/25	-										
Avg:	0	Avg:	-	Avg:	242	Avg:	215	Avg:	230	Avg:	163	Avg:	1

Date	Day	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Total
10/18	Mon	-	-	-	-	-	-	-	-	-	-	-	-	-	19	4	14	4	16	2	0	0	0	1	0	60
10/19	Tue	0	0	0	1	0	4	8	50	14	19	17	14	27	14	10	20	20	16	0	7	0	0	1	0	242
10/20	Wed	0	0	0	0	0	0	3	42	16	13	14	23	31	4	2	23	9	31	2	2	0	0	0	0	215
10/21	Thu	0	0	0	0	0	0	3	46	15	18	18	28	27	7	19	23	15	10	0	0	0	1	0	0	230
10/22	Fri	0	0	0	1	0	0	2	30	8	10	6	10	28	14	8	11	19	14	2	0	0	0	0	0	163
10/23	Sat	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
10/24	Sun	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10/25	Mon	0	0	0	0	1	0	2	28	13	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-	58

Transportation Development Division - TSM Unit

Site Number:	21157			Site Name:	Columbia East Entrance			Region:	2			Vehicle Type:	Vehicles			County:	Marion								
Street Number:	0			Mile Point:				Start Date:	10/18/2010			Lane / Direction / Flow:	Combined												
	ADT:	890		Avg Weekdays (Mon - Thu):	-			Avg Day:	926																
	Max Hour:	396		Day:	Thu			Date:	10/21/2010			Hour:	17												
	Max Day:	1538		Day:	Tue			Date:	10/19/2010																

Sunday		Monday		Tuesday		Wednesday		Thursday		Friday		Saturday	
Date	Value	Date	Value	Date	Value	Date	Value	Date	Value	Date	Value	Date	Value
		10/18	-	10/19	1538	10/20	1502	10/21	1499	10/22	1016	10/23	00
10/24	01	10/25	-										
Avg:	1	Avg:	-	Avg:	1538	Avg:	1502	Avg:	1499	Avg:	1016	Avg:	0

Date	Day	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Total
10/18	Mon	-	-	-	-	-	-	-	-	-	-	-	-	104	42	47	54	383	94	0	2	2	3	0	0	731
10/19	Tue	2	2	2	1	1	156	283	117	29	40	35	122	51	56	55	76	375	107	11	0	5	2	9	1	1538
10/20	Wed	0	3	0	1	0	152	260	104	68	45	42	72	92	66	58	63	367	94	3	2	5	3	0	2	1502
10/21	Thu	1	2	3	1	1	140	281	118	25	54	52	83	89	57	68	47	396	75	3	0	2	0	0	1	1499
10/22	Fri	0	2	0	2	0	130	216	101	53	49	54	59	29	23	31	115	125	27	0	0	0	0	0	0	1016
10/23	Sat	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10/24	Sun	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
10/25	Mon	0	0	0	0	0	6	10	10	18	18	23	-	-	-	-	-	-	-	-	-	-	-	-	-	85

Transportation Development Division - TSM Unit

Site Number:	21187			Site Name:	Willimette Entrance			Region:	2			Vehicle Type:	Vehicles			County:	Marion								
Street Number:	0			Mile Point:				Start Date:	10/18/2010			Lane / Direction / Flow:	Combined												
	ADT:	160		Avg Weekdays (Mon - Thu):	-			Avg Day:	165																
	Max Hour:	36		Day:	Mon			Date:	10/18/2010			Hour:	13												
	Max Day:	244		Day:	Tue			Date:	10/19/2010																

Sunday		Monday		Tuesday		Wednesday		Thursday		Friday		Saturday	
Date	Value	Date	Value	Date	Value	Date	Value	Date	Value	Date	Value	Date	Value
		10/18	-	10/19	244	10/20	199	10/21	182	10/22	147	10/23	142
10/24	77	10/25	-										
Avg:	77	Avg:	-	Avg:	244	Avg:	199	Avg:	182	Avg:	147	Avg:	142

Date	Day	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Total
10/18	Mon	-	-	-	-	-	-	-	-	-	-	-	-	36	16	20	7	18	15	6	3	2	6	1	0	130
10/19	Tue	0	0	0	0	0	0	0	2	16	18	19	23	17	17	17	20	8	22	17	9	15	24	0	0	244
10/20	Wed	0	0	0	0	0	0	0	6	24	15	12	15	20	15	22	9	11	16	17	0	2	15	0	0	199
10/21	Thu	0	0	0	0	0	0	1	4	10	3	18	20	21	32	13	19	16	14	10	0	1	0	0	0	182
10/22	Fri	0	0	0	0	0	0	0	7	9	16	13	22	18	21	14	6	8	2	9	2	0	0	0	0	147
10/23	Sat	0	0	0	0	0	3	11	1	3	14	14	16	14	11	5	10	6	4	4	0	1	3	22	0	142
10/24	Sun	0	0	0	0	0	0	0	0	4	2	5	6	6	10	11	9	9	3	1	0	4	7	0	0	77
10/25	Mon	0	0	0	0	0	0	2	4	8	12	24	-	-	-	-	-	-	-	-	-	-	-	-	-	50

Transportation Development Division - TSM Unit

Site Number:	21122	Site Name:	Orange Entrance	Region:	2	Vehicle Type:	Vehicles	County:	Marion
Street Number:	0	Mile Point:		Start Date:	10/18/2010	Lane / Direction / Flow:	Combined		

ADT:	70	Avg Weekdays (Mon - Thu):	-	Avg Day:	75			
Max Hour:	15	Day:	Tue	Date:	10/19/2010	Hour:	12	
Max Day:	116	Day:	Wed	Date:	10/20/2010			

Sunday		Monday		Tuesday		Wednesday		Thursday		Friday		Saturday	
Date	Value	Date	Value	Date	Value	Date	Value	Date	Value	Date	Value	Date	Value
		10/18	-	10/19	100	10/20	116	10/21	84	10/22	58	10/23	54
10/24	40	10/25	-										
Avg:	40	Avg:	-	Avg:	100	Avg:	116	Avg:	84	Avg:	58	Avg:	54

Date	Day	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Total
10/18	Mon	-	-	-	-	-	-	-	-	-	-	-	-	13	6	4	3	5	8	8	1	0	0	0	0	48
10/19	Tue	0	0	0	0	0	0	5	0	2	7	4	15	5	11	8	3	15	6	9	3	0	2	3	2	100
10/20	Wed	0	0	0	0	0	0	0	2	8	8	3	15	12	4	15	13	5	15	13	0	0	0	2	1	116
10/21	Thu	0	0	0	0	0	3	0	0	6	13	2	6	9	7	6	3	9	4	2	0	1	1	0	12	84
10/22	Fri	0	0	0	0	0	0	0	0	7	6	3	2	7	12	13	2	2	2	2	0	0	0	0	0	58
10/23	Sat	0	0	0	1	0	0	0	0	3	0	5	2	3	10	8	6	8	5	2	1	0	0	0	0	54
10/24	Sun	0	0	0	0	0	1	6	0	0	0	1	4	7	4	1	6	3	5	2	0	0	0	0	0	40
10/25	Mon	0	0	0	0	0	0	0	0	4	4	1	-	-	-	-	-	-	-	-	-	-	-	-	-	9

Transportation Development Division - TSM Unit

Site Number:	21114			Site Name:	Blue Entrance			Region:	2			Vehicle Type:	Vehicles			County:	Marion								
Street Number:	0			Mile Point:				Start Date:	10/18/2010			Lane / Direction / Flow:	Combined												
	ADT:	160		Avg Weekdays (Mon - Thu):	-			Avg Day:	170																
	Max Hour:	30		Day:	Thu			Date:	10/21/2010			Hour:	16												
	Max Day:	219		Day:	Wed			Date:	10/20/2010																

Sunday		Monday		Tuesday		Wednesday		Thursday		Friday		Saturday	
Date	Value	Date	Value	Date	Value	Date	Value	Date	Value	Date	Value	Date	Value
		10/18	-	10/19	213	10/20	219	10/21	215	10/22	173	10/23	112
10/24	91	10/25	-										
Avg:	91	Avg:	-	Avg:	213	Avg:	219	Avg:	215	Avg:	173	Avg:	112

Date	Day	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Total
10/18	Mon	-	-	-	-	-	-	-	-	-	-	-	-	14	9	19	15	10	8	12	1	0	9	0	2	99
10/19	Tue	0	2	2	3	0	4	7	11	7	16	15	22	15	23	18	17	16	10	11	7	2	2	1	2	213
10/20	Wed	0	0	3	1	0	1	7	5	16	20	14	24	11	16	22	27	19	8	11	3	2	4	3	2	219
10/21	Thu	0	0	0	2	5	0	7	3	12	14	13	15	18	28	17	30	20	14	3	0	3	4	0	7	215
10/22	Fri	0	0	3	1	3	0	5	4	12	15	12	17	11	17	16	21	12	6	7	5	6	0	0	0	173
10/23	Sat	0	0	3	1	7	7	8	9	6	3	1	11	5	3	11	6	8	3	2	6	4	3	5	0	112
10/24	Sun	3	2	0	3	3	0	5	1	0	3	5	15	5	10	9	4	4	7	2	1	4	0	0	5	91
10/25	Mon	3	0	0	3	0	0	7	5	13	11	10	-	-	-	-	-	-	-	-	-	-	-	-	-	52

Transportation Development Division - TSM Unit

Site Number:	21160		Site Name:	Green Entrance		Region:	2		Vehicle Type:	Vehicles		County:	Marion											
Street Number:	0		Mile Point:			Start Date:	10/18/2010		Lane / Direction / Flow:	Combined														
	ADT:	140	Avg Weekdays (Mon - Thu):	-		Avg Day:	145																	
	Max Hour:	29	Day:	Wed		Date:	10/20/2010		Hour:	9														
	Max Day:	227	Day:	Wed		Date:	10/20/2010																	

Sunday		Monday		Tuesday		Wednesday		Thursday		Friday		Saturday	
Date	Value	Date	Value	Date	Value	Date	Value	Date	Value	Date	Value	Date	Value
		10/18	-	10/19	203	10/20	227	10/21	181	10/22	201	10/23	34
10/24	24	10/25	-										
Avg:	24	Avg:	-	Avg:	203	Avg:	227	Avg:	181	Avg:	201	Avg:	34

Date	Day	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Total
10/18	Mon	-	-	-	-	-	-	-	-	-	-	-	-	13	14	12	9	19	19	5	2	1	1	0	0	95
10/19	Tue	0	0	0	0	0	3	11	17	18	14	18	20	16	15	14	12	20	20	3	0	2	0	0	0	203
10/20	Wed	0	0	0	0	0	2	9	15	29	22	12	14	13	14	17	23	23	21	6	3	4	0	0	0	227
10/21	Thu	0	0	0	0	2	2	7	14	22	16	10	12	9	18	7	22	16	22	0	1	1	0	0	0	181
10/22	Fri	0	0	0	0	0	2	9	10	22	8	11	24	22	28	10	22	15	16	1	0	0	0	1	0	201
10/23	Sat	0	0	0	0	0	0	0	0	9	0	5	8	6	1	0	0	2	0	1	2	0	0	0	0	34
10/24	Sun	0	0	0	0	0	1	2	2	3	0	1	0	3	0	5	0	1	2	1	1	0	2	0	0	24
10/25	Mon	0	0	0	0	0	2	6	12	17	12	9	-	-	-	-	-	-	-	-	-	-	-	-	-	58

Transportation Development Division - TSM Unit

Site Number:	21159			Site Name:	Purple Entrance			Region:	2			Vehicle Type:	Vehicles			County:	Marion								
Street Number:	0			Mile Point:				Start Date:	10/18/2010			Lane / Direction / Flow:	Combined												
	ADT:	130		Avg Weekdays (Mon - Thu):	-			Avg Day:	137																
	Max Hour:	33		Day:	Thu			Date:	10/21/2010			Hour:	21												
	Max Day:	222		Day:	Thu			Date:	10/21/2010																

Sunday		Monday		Tuesday		Wednesday		Thursday		Friday		Saturday	
Date	Value	Date	Value	Date	Value	Date	Value	Date	Value	Date	Value	Date	Value
		10/18	-	10/19	170	10/20	187	10/21	222	10/22	152	10/23	54
10/24	37	10/25	-										
Avg:	37	Avg:	-	Avg:	170	Avg:	187	Avg:	222	Avg:	152	Avg:	54

Date	Day	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Total
10/18	Mon	-	-	-	-	-	-	-	-	-	-	-	-	12	21	4	9	9	17	12	0	1	4	0	0	89
10/19	Tue	0	1	1	0	0	5	8	7	16	15	9	15	14	15	10	14	15	8	10	4	1	2	0	0	170
10/20	Wed	0	0	2	0	0	3	4	7	12	24	13	19	12	5	11	11	23	14	10	15	1	1	0	0	187
10/21	Thu	0	0	2	0	0	3	6	6	7	13	11	14	19	12	11	14	17	25	21	4	33	3	0	1	222
10/22	Fri	0	0	2	0	1	2	4	10	10	14	17	17	25	10	6	13	9	6	4	1	0	1	0	0	152
10/23	Sat	0	0	0	0	0	0	2	1	3	2	3	8	1	6	6	10	8	1	0	0	0	0	3	0	54
10/24	Sun	0	0	0	0	0	0	0	0	0	5	4	1	2	8	4	4	0	4	3	1	0	0	0	1	37
10/25	Mon	0	0	0	0	0	0	5	4	4	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	17

Transportation Development Division - TSM Unit

Site Number:	21168			Site Name:	Yellow Entrance				Region:	2			Vehicle Type:	Vehicles			County:	Marion						
Street Number:	0			Mile Point:					Start Date:	10/18/2010			Lane / Direction / Flow:	Combined										
	ADT:	290		Avg Weekdays (Mon - Thu):	-				Avg Day:	306														
	Max Hour:	59		Day:	Tue				Date:	10/19/2010			Hour:	12										
	Max Day:	504		Day:	Tue				Date:	10/19/2010														

Sunday		Monday		Tuesday		Wednesday		Thursday		Friday		Saturday	
Date	Value	Date	Value	Date	Value	Date	Value	Date	Value	Date	Value	Date	Value
		10/18	-	10/19	504	10/20	399	10/21	419	10/22	379	10/23	72
10/24	63	10/25	-										
Avg:	63	Avg:	-	Avg:	504	Avg:	399	Avg:	419	Avg:	379	Avg:	72

Date	Day	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Total
10/18	Mon	-	-	-	-	-	-	-	-	-	-	-	-	39	20	23	26	49	17	10	5	4	4	0	0	197
10/19	Tue	0	0	2	3	4	7	34	52	32	34	35	59	29	36	52	41	43	21	13	3	2	2	0	0	504
10/20	Wed	0	0	1	2	4	2	31	43	32	24	20	43	35	17	21	27	35	29	13	6	8	6	0	0	399
10/21	Thu	0	1	2	1	9	5	27	53	28	29	21	45	45	19	28	31	36	15	4	3	6	2	9	0	419
10/22	Fri	2	0	1	4	6	0	30	47	29	26	22	39	38	40	20	18	33	11	6	0	3	4	0	0	379
10/23	Sat	0	0	0	0	0	2	5	0	10	1	5	5	7	4	3	7	11	3	3	2	1	1	0	2	72
10/24	Sun	1	0	0	0	0	2	7	2	3	3	5	1	2	0	2	6	3	2	11	3	7	0	0	3	63
10/25	Mon	1	0	0	0	2	8	24	57	33	46	-	-	-	-	-	-	-	-	-	-	-	-	-	-	171

Transportation Development Division - TSM Unit

Site Number:	21105			Site Name:	Vans Entrance				Region:	2			Vehicle Type:	Vehicles			County:	Marion							
Street Number:	0			Mile Point:					Start Date:	10/18/2010			Lane / Direction / Flow:	Combined											
	ADT:	140		Avg Weekdays (Mon - Thu):	-				Avg Day:	142															
	Max Hour:	39		Day:	Tue				Date:	10/19/2010			Hour:	12											
	Max Day:	239		Day:	Tue				Date:	10/19/2010															

Sunday		Monday		Tuesday		Wednesday		Thursday		Friday		Saturday	
Date	Value	Date	Value	Date	Value	Date	Value	Date	Value	Date	Value	Date	Value
		10/18	-	10/19	239	10/20	201	10/21	208	10/22	174	10/23	30
10/24	00	10/25	-										
Avg:	0	Avg:	-	Avg:	239	Avg:	201	Avg:	208	Avg:	174	Avg:	30

Date	Day	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Total
10/18	Mon	-	-	-	-	-	-	-	-	-	-	-	-	8	6	13	36	16	1	0	0	0	0	0	0	80
10/19	Tue	0	0	0	1	19	23	13	7	10	9	20	39	21	7	11	37	18	4	0	0	0	0	0	0	239
10/20	Wed	0	0	0	0	16	24	15	9	3	6	27	20	15	8	12	32	10	2	0	0	2	0	0	0	201
10/21	Thu	0	0	0	0	10	29	9	12	17	14	19	21	14	12	18	20	12	1	0	0	0	0	0	0	208
10/22	Fri	4	0	0	0	5	16	19	15	5	10	19	22	15	17	11	10	6	0	0	0	0	0	0	0	174
10/23	Sat	0	0	0	0	0	0	0	0	10	3	0	0	1	3	10	0	3	0	0	0	0	0	0	0	30
10/24	Sun	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10/25	Mon	0	0	0	0	3	4	3	1	4	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	15

Transportation Development Division - TSM Unit

Site Number:	21119			Site Name:	Red Entrance				Region:	2			Vehicle Type:	Vehicles			County:	Marion							
Street Number:	0			Mile Point:					Start Date:	10/18/2010			Lane / Direction / Flow:	Combined											
	ADT:	180		Avg Weekdays (Mon - Thu):	-				Avg Day:	185															
	Max Hour:	33		Day:	Tue				Date:	10/19/2010			Hour:	12											
	Max Day:	290		Day:	Thu				Date:	10/21/2010															

Sunday			Monday			Tuesday			Wednesday			Thursday			Friday			Saturday		
Date	Value		Date	Value		Date	Value		Date	Value		Date	Value		Date	Value		Date	Value	
			10/18	-		10/19	201		10/20	198		10/21	290		10/22	230		10/23	105	
10/24	87		10/25	-																
Avg:	87		Avg:	-		Avg:	201		Avg:	198		Avg:	290		Avg:	230		Avg:	105	

Date	Day	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Total
10/18	Mon	-	-	-	-	-	-	-	-	-	-	-	-	27	6	19	2	13	14	9	1	2	0	0	0	93
10/19	Tue	0	4	0	4	2	2	11	3	6	5	20	33	19	22	6	15	16	6	10	6	5	4	2	0	201
10/20	Wed	0	0	4	6	2	2	20	18	9	14	14	11	2	12	8	2	17	25	3	9	13	7	0	0	198
10/21	Thu	0	4	0	7	2	5	6	8	9	8	16	27	19	33	18	24	24	29	12	10	10	5	14	0	290
10/22	Fri	0	0	4	0	4	12	22	8	6	17	13	20	25	5	22	28	14	7	8	0	0	2	9	4	230
10/23	Sat	0	0	2	3	5	0	7	2	0	5	17	4	16	11	12	3	2	5	3	4	0	4	0	0	105
10/24	Sun	0	0	0	0	5	0	2	3	5	2	11	3	4	3	13	6	2	18	0	0	0	6	0	4	87
10/25	Mon	0	0	3	4	2	7	13	7	25	19	-	-	-	-	-	-	-	-	-	-	-	-	-	-	80

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ADT For: AIRPORT RD NE
Rd#: 59
Date: 9/18/2007
From: EHLEN RD
To: ARNDT RD

Milepost	ADT	Date	Source	Comments
0.03	2632	6/11/2007	Hose Count	N OF EHLEN RD (CR 96)
0.58	2610	9/18/2007	Estimated Volume	S OF KEIL RD (CR 429)
0.6	2600	9/18/2007	Estimated Volume	N OF KEIL RD (CR 429)
1.86	2521	6/4/2007	Classifier	S OF ARNDT RD (CR 428)

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ADT For: KEIL RD NE
Rd#: 429
Date: 9/18/2007
From: WILSONVILLE-HUBBARD CUT OFF(PAVED)
To: BOONES FERRY ROAD

Milepost	ADT	Date	Source	Comments
0.05	1010	6/6/2007	Classifier	W OF WILSONVILLE-HUBBARD CUT OFF
0.07	735	6/11/2007	Hose Count	E OF WILSONVILLE-HUBBARD CUT OFF
0.89	720	9/18/2007	Estimated Volume	W OF AIRPORT RD (CR 59)

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ADT For: ARNDT RD NE
Rd#: 428
Date: 9/18/2007
From: AIRPORT RD
To: BOONES FERRY RD

Milepost	ADT	Date	Source	Comments
0.010	10062	6/4/2007	Classifier	W OF AIRPORT RD (CR 59)
0.24	9500	9/18/2007	Estimated Volume	E OF WILSONVILLE-HUBBARD CUT OFF
0.26	2500	9/18/2007	Estimated Volume	W OF WILSONVILLE-HUBBARD CUT OFF
0.74	2128	6/4/2007	Classifier	E OF BOONES FERRY RD (CR 11)

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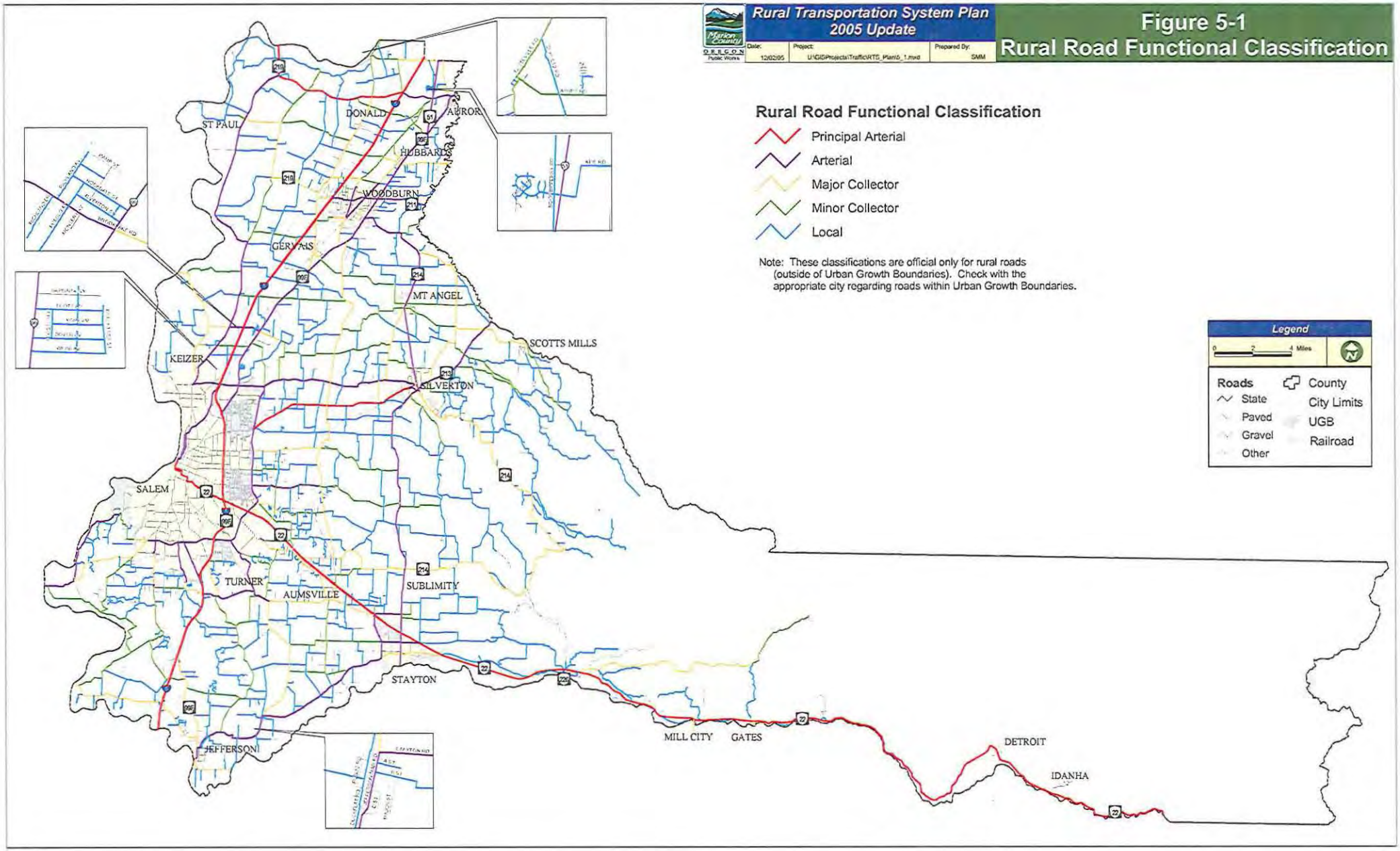
ADT For: EHLEN RD NE
Rd#: 96
Date: 9/18/2007
From: DONALD RD
To: AURORA CITY LIMITS

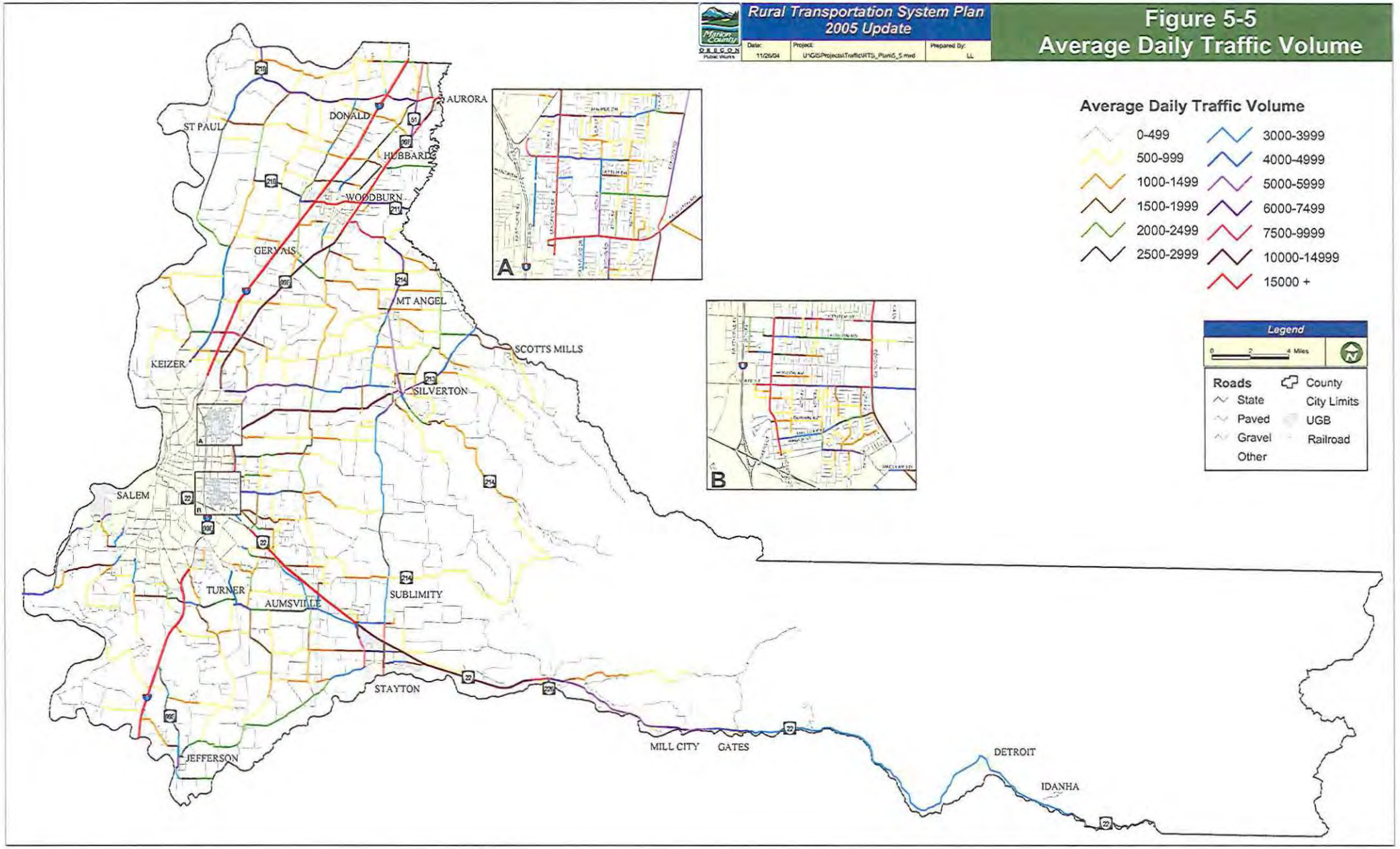
Milepost	ADT	Date	Source	Comments
2.77	6200	9/18/2007	Estimated Volume	NE OF DONALD RD (CR 61)
3.54	6454	7/12/2007	Classifier	W OF BUTTEVILLE RD (CR 65)
3.56	7866	6/11/2007	Classifier	E OF BUTTEVILLE RD (CR 65)
5.17	9670	6/6/2007	Classifier	W OF BENTS RD (CR 425)
5.22	9994	7/16/2003	Classifier	UNDER I - 5
5.28	8488	6/6/2007	Classifier	SE OF I-5 INTERCHANGE
6.85	7258	6/20/2007	Classifier	W OF BOONES FERRY RD (CR 10)
6.9	10945	6/22/2007	Hose Count	W OF WILSONVILLE-HUBBARD CUT OFF
6.92	5158	6/20/2007	Classifier	E OF WILSONVILLE-HUBBARD CUT OFF
7.44	8300	9/18/2007	Estimated Volume	W OF COLE LN (CR 430)
7.65	8408	6/6/2007	Classifier	W OF AIRPORT RD (CR 59)
7.7	9500	9/18/2007	Estimated Volume	E OF AIRPORT RD (CR 59)
7.81	9664	6/20/2007	Classifier	@ AURORA CITY LIMITS

A

STREET	CROSS STREET	2008 ADT	2005 ADT	2002 ADT	2000 ADT
ABERNETHY RD	WEST OF HOLCOMB	5050	-	-	-
ADVANCE RD	WEST OF MOUNTAIN	600	930	830	950
ADVANCE RD	EAST OF STAFFORD	1450	1950	2150	2150
AIRPORT RD	SOUTH OF MILEY	4500	6450	5300	6600
ALBERTA AVE	WEST OF BELL	860	860	1050	870
ALDERCREST RD	NORTH OF RUSK	1300	1450	1200	1200
ALDERCREST RD	NORTH OF THIESSEN	3100	2850	3000	2800
AMISIGGER RD	NORTH OF HWY 224	2850	2900	2700	2950
ARNDT RD	EAST OF AIRPORT RD	11450	11600	10950	11950
ARNDT RD	EAST OF KNIGHTS BRIDGE RD	7500	6400	6700	6650
ARRAH WANNA BLVD	SOUTH OF HWY 26	500	470	520	580

MERIDIAN RD	NORTH OF BARLOW	670	650	850	620
MERIDIAN WAY	EAST OF 65TH	640	780	690	580
MILEY RD	EAST OF I-5	9200	12000	9900	8550
MILEY RD	EAST OF AIRPORT	7400	7400	7000	7100
MOLALLA AVE	EAST OF HWY 213	3900	3350	3700	5450
MOLALLA AVE	SOUTH OF VICK	6650	3950	4700	4950
MOLALLA AVE	SOUTH OF WARRICK	1800	1900	2300	2150
MONROE ST	WEST OF LINWOOD	2350	2350	2450	2500
MONROE ST	EAST OF LINWOOD	2250	2200	2100	2300
MONTE CRISTO RD	WEST OF HWY 213	480	530	450	440
MONTEREY AVE	EAST OF 82ND	6400	5700	6000	4200
MORGAN RD	EAST OF BAKER	620	680	670	400
MOUNTAIN RD	EAST OF STAFFORD	2750	3250	2450	2600
MOUNTAIN RD	NORTH OF ADVANCE	930	1050	880	1050
MOUNTAIN RD	SOUTH OF ADVANCE	1550	1550	1450	1650
MOUNTAIN RD	SOUTH OF HOFFMAN	400	300	320	450
MULINO RD	SOUTH OF HAINES	1350	1750	1600	1300
MULINO RD	SOUTH OF TOWNSHIP	1700	2000	1750	1550
MULINO RD	WEST OF CENTRAL POINT	1200	1400	1250	1350
MULINO RD	SOUTH OF CENTRAL POINT	1100	1300	1200	1300
MULINO RD	WEST OF AIRPORT	1200	1300	1250	1550
MULINO RD	WEST OF HWY213	1250	1350	1250	1550
MUSIC CAMP RD	EAST OF FIRWOOD	210	550	210	230


Rural Transportation System Plan
2005 Update
Figure 5-1
Rural Road Functional Classification
Rural Road Functional Classification
Principal Arterial
Arterial
Major Collector
Minor Collector
Local
Note: These classifications are official only for rural roads (outside of Urban Growth Boundaries). Check with the appropriate city regarding roads within Urban Growth Boundaries.
Legend
Roads
State
Paved
Gravel
Other
County
City Limits
UGB
Railroad
ST PAUL
DONALD
AURORA
HUBBARD
WOODBURN
GERVAIS
MT ANGEL
SCOTTS MILLS
KEIZER
SILVERTON
SALEM
TURNER
AUMSVILLE
SUBLIMITY
STAYTON
JEFFERSON
MILL CITY
GATES
DETROIT
IDANHA


Rural Transportation System Plan
2005 Update
Figure 5-5
Average Daily Traffic Volume
Average Daily Traffic Volume
0-499
500-999
1000-1499
1500-1999
2000-2499
2500-2999
3000-3999
4000-4999
5000-5999
6000-7499
7500-9999
10000-14999
15000 +
Legend
Roads
State
Paved
Gravel
Other
County
City Limits
UGB
Railroad
AURORA
DONALD
ST PAUL
HUBBARD
WOODBURN
GERVAIS
MT ANGEL
SCOTTS MILLS
KEIZER
SILVERTON
SALEM
TURNER
AUMSVILLE
SUBLIMITY
STAYTON
JEFFERSON
MILL CITY
GATES
DETROIT
IDANHA
A
B

Rural Road Functional Classification Characteristics

Principal Arterial
- Continuous segments with trip length and travel density indicative of statewide or interstate travel; and
- Serve all of the large urban areas and most of the moderate sized cities.

Arterial
- Link cities, larger towns, and other major traffic generators; and provide interstate and inter-county service: and
- Spaced such that all developed areas of the region are within reasonable distance of an arterial; and
- Serve a higher travel density, trip length, and overall travel speed than collector and local systems.

Major Collector
- Provide service to larger towns not directly served by higher classed roads and to other traffic generators of equivalent intra-county importance (including parks, tourist attractions, significant resource areas, etc.); and
- Link these places with nearby towns and cities, or routes of higher classification; and
- Serve the more important intra-county travel corridors.

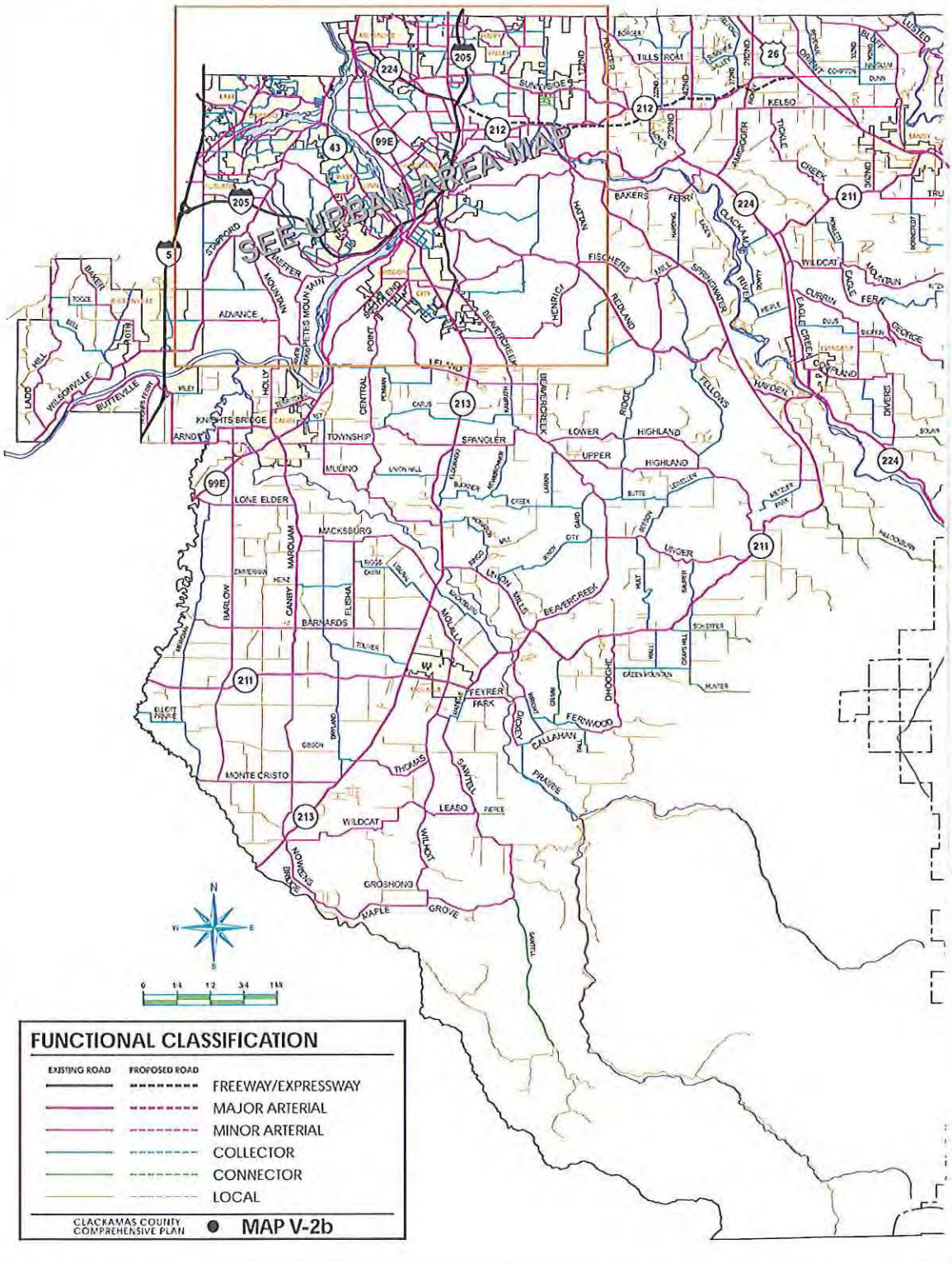
Minor Collector
- Spaced at intervals to collect traffic from local roads and bring all developed areas within a reasonable distance of a collector road; and
- Provide service to any remaining smaller communities and traffic generators; and
- Link locally important traffic generators with their local constituents.

Local
- Primarily provide access to adjacent lands; and
- Provide relatively short travel distances compared to higher classed facilities.

The original (1998) RTSP included a list of roadways and their functional classification. As part of this 2005 Update, some changes are being made as shown in **Table 5-2**, which better reflect the current and future function of each roadway.

FUNCTIONAL CLASSIFICATION GUIDELINES

Classification	Number of Traffic Lanes	Purpose	Access Impacts	Examples
Freeway Expressway	4-8	Serves Interregional and Intrareginal Trips. Carries heavy volume at high speed.	Freeways and expressways are intended to move traffic and not provide direct access to land use activities. Access to these facilities will be from other arterials.	I-205 Milwaukie Expressway
Major Arterial	3-7 Urban 2-4 Rural	Carries local and through traffic to and from destinations outside local community, connects cities and rural centers. Moderate to heavy volume, moderate to high speed.	Direct Access to major arterials will be limited. Access should be restricted to major generators.	Sunnyside Road Boones Ferry Road Highway 26
Minor Arterial	2-5	Connects collectors to higher order roadways. Carries moderate volume at moderate speed.	Direct access will be limited, however to a lesser degree than major arterials. The number and location of driveways should be controlled.	Oatfield Road Beavercreek Road Borland Road



Classification	Number of Traffic Lanes	Purpose	Access Impacts	Examples
Collector	2	Principle carrier within neighborhoods or single land use areas. Links neighbor-hoods with major activity centers and arterials. Generally not for through traffic. Low to moderate volume; low to moderate speed. New collectors should intersect minor arterials rather than major arterials.	Collectors provide access to abutting land and to the arterial system. Access to individual parcels is usually allowed.	Roethe Road Welches Road Pilkington Road
Connector	2	Collects traffic from and distribute traffic to local streets within neighborhoods or industrial districts. Usually longer than local streets. Low traffic volumes and speeds. Primarily serves access and local circulation functions. Not for through traffic	Connectors provide direct access to abutting properties	Risley Ave Harold Ave Pleasant Ct
Local	2	Provides access to abutting property and connects to higher order roads. New local roads should intersect collectors or, if necessary, minor arterials.	Local streets provide direct access to abutting properties. Adjacent land is normally residential.	Blanton Street Windy City Road La Bonita Way

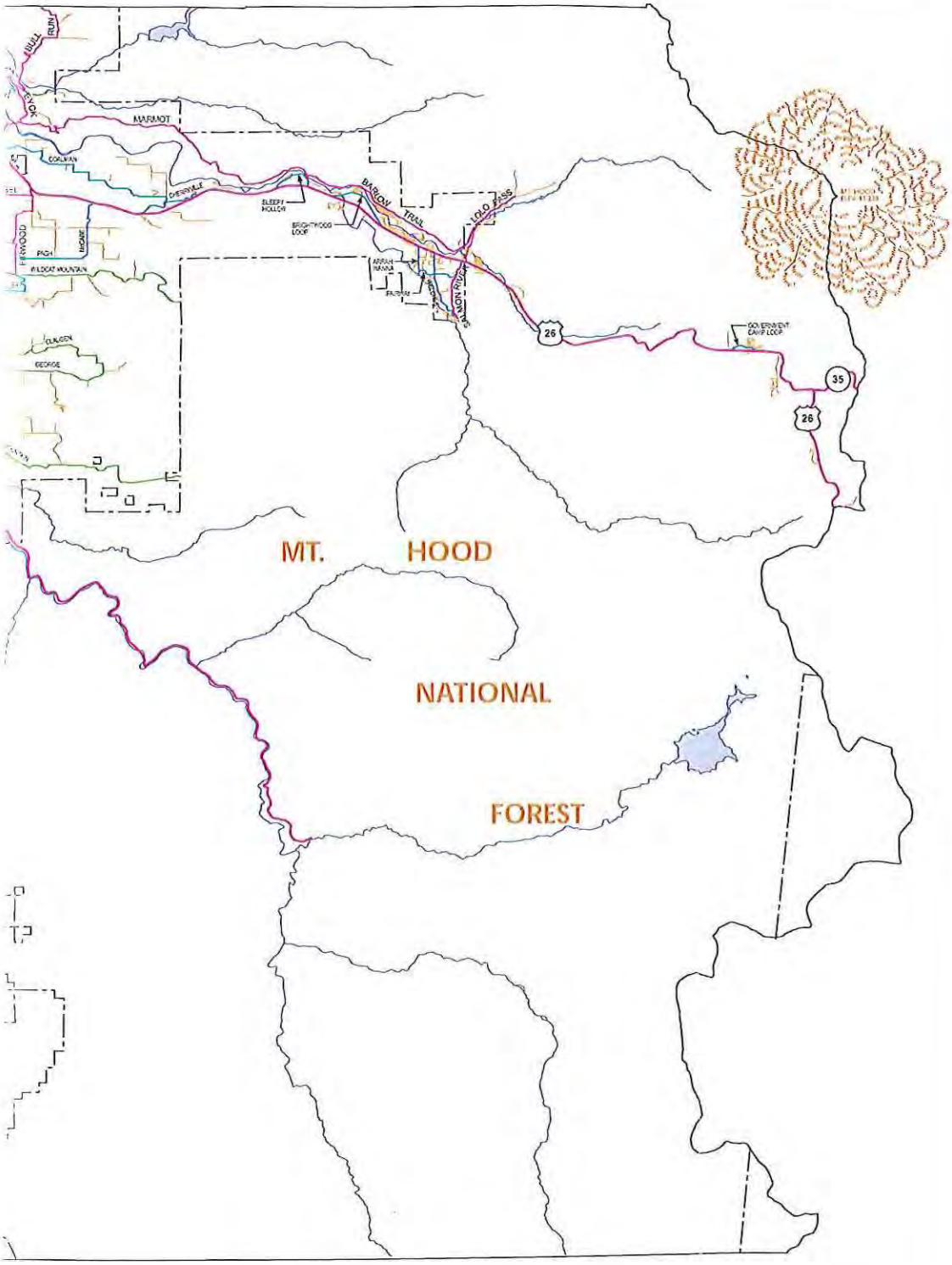


Table V-3
Clackamas County
Roadway Classifications and Guidelines (Continued)

Roadway Classifications and Guidelines (continued)						
FUNCTIONAL CLASSIFICATION	NUMBER OF TRAFFIC LANES	MINIMUM RIGHT-OF-WAY WIDTH*	PAVED WIDTH	SIDEWALK/ PATHWAY (1/17/08)	BIKWAYS	LANDSCAPE STRIP**
Freeway/ Expressway	4 to 8	Defer to Federal and State Standards	Defer to Federal and State	No	No	Defer to Federal and State
Major Arterial	3 to 7 Urban 2 to 4 Rural	60'-125' More if needed for terrain, turn lanes or heavy volume	36'-98'	Yes In urban areas only	Yes	Yes In urban areas
Minor Arterial	2 to 5	60' – 115'	36' – 90'	Yes In urban areas only	Yes	Yes In urban areas
Collector	2 to 3	60' – 85' Less if volume and land use density are low and terrain allows	32' – 61'	Yes In urban areas only	Yes	Yes In urban areas
Connector	2	55'	28' – 34' Residential 28' – 40' Industrial	Yes In urban areas only	If ROW allows	Yes In urban areas
Local	2	40' – 50'	28'	Yes***	No	Yes In urban areas
Alley	2	16'	16'	No	No	No

* - Preferred dimensions are not adjusted for adjacent land uses; additional right-of-way may be required for slope, sign, sidewalk and utility easements.

** - Required unless acquiring right-of-way is impractical due to wetlands, topographic conditions, resource protection, or preexisting development patterns.

*** - Sidewalks are required on all new streets within the Urban Growth Boundary and when development or redevelopment occurs on existing streets. (1/17/08)

Milepoint	2009 AADT All Vehicles		Location Description
			PACIFIC HIGHWAY NO. 1 (Continued)
258.10	*88900*		0.40 mile south of Hayesville Interchange
259.50	*81800*		0.70 mile south of Chemawa Road Interchange
263.09	*87400*		0.40 mile south of Brooks Interchange
271.55	*81900*		0.30 mile south of Hillsboro-Silverton Highway (OR214)
278.27	*83600*		0.40 mile south of Aurora-Donald Interchange (Ehlen Road)
281.20	*85700*	*	Wilsonville Automatic Traffic Recorder, Sta. 03-011, 1.38 miles south of Wilsonville-Hubbard Highway No. 51 (OR551)
283.58	*115700*		0.30 mile south of Wilsonville Interchange
285.88	*117700*		0.30 mile south of Stafford Road
287.91	*129800*		0.60 mile south of East Portland Freeway (I-205)
289.20	*134300*		0.30 mile south of Nyberg Road Interchange
290.14	*153600*	*	Tigard Automatic Traffic Recorder, Sta. 34-008, 0.34 mile south of Boones Ferry Road Interchange
290.99	*153700*		0.30 mile south of Upper Boones Ferry Road Interchange
291.80	*154300*		0.40 mile south of Beaverton-Tigard Highway (OR217)
293.00	*107300*		0.30 mile south of Haines Road
293.51	*104900*		0.30 mile south of Pacific Highway West (OR99W), at Tigard Jct
294.74	*118800*		0.30 mile south of Capitol Highway
295.43	*119000*		0.10 mile south of Taylors Ferry Road Connection
296.24	*116600*		0.10 mile south of Spring Garden Road Undercrossing
296.45	*120800*		0.10 mile south of Multnomah Boulevard Undercrossing
297.08	*126100*		0.10 mile south of Terwilliger Boulevard Undercrossing
298.24	*140900*	*	Iowa Automatic Traffic Recorder, Sta. 26-016, 1.07 miles north of S.W. Terwilliger Boulevard, in Portland
299.13	*137700*		0.10 mile south of Macadam and Hood Avenue connections
299.87	*123000*		0.10 mile south of Stadium Freeway (I-405)
300.37	*138600*	*	Marquam Bridge Automatic Traffic Recorder, Sta. 26-026, 0.34 mile northeast of Stadium Freeway No. 61 (I-405)
301.09	*89200*		Undercrossing, S.E. Morrison Street Bridge
301.50	*66700*		Undercrossing, Burnside Bridge
301.70	*78600*		Undercrossing, eastbound connection to Columbia River Highway (I-84)
301.99	*122500*		Overcrossing, N.E. Holladay Street
302.70	*121000*		0.40 mile south of Stadium Freeway (I-405)
303.68	*136500*		0.30 mile south of N. Going Street Interchange
304.23	*119000*		0.20 mile south of N. Killingsworth Street Overcrossing
304.66	*130000*	*	Minnesota Freeway Automatic Traffic Recorder, Sta. 26-019, 0.03 mile south of N. Ainsworth Street undercrossing
305.14	*123700*		0.30 mile south of Northeast Portland Highway (US30 Bypass)
305.64	*109100*		0.20 mile north of Northeast Portland Highway (US30 Bypass)
306.36	*93900*		0.50 mile south of Overcrossing Pacific Highway West (OR99W)
307.08	*98500*		0.38 mile south of Pacific Highway East (OR99E)
307.66	*126800*		0.20 mile north of Pacific Highway East (OR99E)
307.97	*121100*	*	Interstate Bridge Automatic Traffic Recorder, Sta. 26-004, 0.41 mile south of Oregon-Washington State Line
			COLUMBIA RIVER HIGHWAY NO. 2
			Milepoint indicates distance from Pacific Highway (I-5), in Portland
0.49	*142100*	*	West Banfield Automatic Traffic Recorder, Sta. 26-015, 0.49 mile east of Pacific Highway No. 1 (I-5)
0.76	*150200*	*	0.24 mile east of Pacific Highway East (OR99E, Grand Avenue) undercrossing
1.43	*168700*		0.57 mile west of N.E. 33rd Avenue
2.27	*147900*		0.27 mile east of N.E. 33rd Avenue

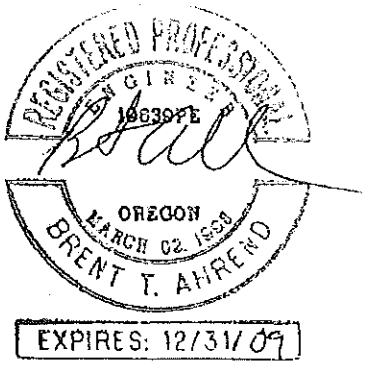
Milepoint	2009 AADT All Vehicles		Location Description
			KLAMATH FALLS-MALIN HIGHWAY NO. 50 (Continued)
27.08	*170*		0.02 mile north of Oregon-California State Line (Loveness Road)
			ESPLANADE STREET SPUR HIGHWAY NO. 50
			Milepoint indicates distance from Klamath Falls-Lakeview Highway (OR39/OR140), in Klamath Falls
Y 4.98	*7200*		0.01 mile southwest of Klamath Falls-Malin Highway (OR39), on Esplanade Street
			WILSONVILLE-HUBBARD HIGHWAY NO. 51
			Milepoint indicates distance Pacific Highway (I-5), south of Wilsonville
0.50	*19900*		0.50 mile south of Pacific Highway (I-5)
1.48	*10800*		0.01 mile south of Arndt Road, Clackamas-Marion County Line
3.47	*11000*		0.01 mile north of Ehlen Road
3.70	*7700*	*	Hubbard Automatic Traffic Recorder, Sta. 24-016, 0.22 mile south of Ehlen Road
5.43	*7400*		0.20 mile north of Pacific Highway East (OR99E)
			HEPPNER HIGHWAY NO. 52
			Milepoint indicates distance from Columbia River Highway (I-84), at Heppner Jct.
0.30	*150*		0.30 mile south of Columbia River Highway (I-84)
3.93	*140*		On Willow Creek Bridge
8.44	*120*		Gilliam-Morrow County Line
13.88	*120*		0.10 mile north of Fairview Road at Cecil
14.12	*120*		0.02 mile south of Immigrant Road
19.29	*110*		0.10 mile north of E. Morgan Road
19.60	*120*		0.21 mile south of E. Morgan Road
20.42	*150*		0.01 mile south of Ely Canyon Road
24.58	*170*		0.05 mile northwest of McNab West Road
24.73	*280*		0.10 mile east of McNab West Road
27.16	*260*		0.25 mile west of Johnson Grade Road
27.50	*320*		0.01 mile west of Main Street
27.61	*240*		West city limits of Ione
27.89	*600*		0.01 mile east of Green Street
28.33	*610*		0.01 mile west of Ella Road
28.72	*780*		0.03 mile west of Emert Road
29.09	*730*		0.34 mile east of Emert Road
30.36	*640*		0.01 mile west of Jordan Grade Road
30.86	*600*		0.01 mile west of Rhea Creek Road
30.88	*620*		0.01 mile east of Rhea Creek Road
36.11	*640*		North city limits of Lexington
36.41	*950*		0.01 mile northwest of Lexington-Echo Highway (OR207)
36.46	*1700*		0.01 mile southeast of Lexington-Echo Highway (OR207)
36.59	*1700*		0.01 mile northwest of "C" Street
36.61	*1600*		0.01 mile southeast of "C" Street
36.77	*1500*		South city limits of Lexington, 0.01 mile south of "A" Street
37.83	*1400*	*	Lexington Automatic Traffic Recorder, Sta. 25-007, 1.38 miles southeast of Lexington-Echo Highway No. 320 (OR207)

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TRANSPORTATION IMPACT ANALYSIS

HELICOPTER TRANSPORT SERVICES

Aurora, Oregon



Prepared For
Helicopter Transport Services LLC

Completed On
May 27, 2009

Submittal To
Marion County

Project Number
2090040.00

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TABLE OF CONTENTS PAGE

I. Executive summary 2
II. Introduction 4
III. Existing Conditions 6
IV. Pre-Development Conditions 8
V. Site Development 9
VI. Intersection and Roadway Analysis 10
VII. Mitigation 14
VIII. Summary 15
IX. Appendix 18

LIST OF TABLES

Table 1 – Roadway Characteristics 6
Table 2 – Crash Data 7
Table 3 – Trip Generation 9
Table 4 – Intersection Operations 11
Table 5 – Queue Lengths (feet) 12

LIST OF FIGURES

1. Vicinity Map
2. Site Plan
3. Existing Lane Configuration & Intersection Control
4A. 2009 Existing Intersection Volumes – AM Peak Hour
4B. 2009 Existing Intersection Volumes – PM Peak Hour
5A. Background Growth: 1 Year at 2.5% - AM Peak Hour
5B. Background Growth: 1 Year at 2.5% - PM Peak Hour 2010
6A. 2010 Pre-Development Intersection Volumes - AM Peak Hour
6B. 2010 Pre-Development Intersection Volumes - PM Peak Hour
7A. Site Trip Distribution and Assignment - AM Peak Hour
7B. Site Trip Distribution and Assignment – PM Peak Hour
8A. 2010 Post-Development Intersection Volumes - AM Peak Hour
8B. 2010 Post-Development Intersection Volumes - PM Peak Hour

I. EXECUTIVE SUMMARY

DEVELOPMENT DESCRIPTION

A zone change and conditions use application are required for development of the proposed Helicopter Transport Services facility. The site is currently zoned Exclusive Farm Use (EFU) and the proposed zone is Public (P). An airport use is a conditional use in the Public zone. It has been determined the zone change from EFU to P does not result in an increase in trip potential, so only the condition use application is addressed for conditions at buildout of the site.

The Helicopter Transport Services facility is a repair station for the company's helicopters. The company's helicopters are located around the world at different sites, and generally are brought back to this maintenance facility once a year in the late fall for major overhaul and repair during the winter months. After a several month overhaul and repair, the helicopters, pilot crews, mechanics, and fuel tank drivers, then return to service in the spring to specific locations based on contract needs for firefighting services with the company's clients. Thus, the activities within the facility are all related to helicopter maintenance. In addition, there is supporting administrative and management activities for the helicopter maintenance operation.

During the fire season, which runs from May through October/November, only support staff remain in the building, with an estimate of up to 30 employees working an 8:00 am - 5:00 pm shift. During the off-season, running from November through April, employment at the building will increase to up to 70 employees.

The site plan and access locations are still in development. Access will be provided to Keil Road, and will comply with Marion County access and spacing standards.

MAJOR FINDINGS

Trip generation estimates for the Helicopter Transport Services facility were prepared using the Institute of Transportation Engineers *Trip Generation*, Land Use – 110 (General Light Industrial) based on the anticipated peak seasonal 70 employees. A total of 211 daily, 34 AM peak hour and 36 PM peak hour trips are anticipated. Truck trips are expected to be less than 30 per day.

The intersection of OR 551 with Ehlen Road does not currently meet ODOT standards of v/c 0.70. The addition of site trips does not decrease the v/c in the critical PM peak hour. Improvements are planned, as noted in the Draft 2010-2013 STIP (key number 16121), to include building left turn lanes on Ehlen Road and a traffic separator to limit Boones Ferry to right turns. The Marion County 2005 Rural Transportation Plan, Table 8-5 also identifies improvements that are needed at the OR intersection.

- The Airport Road/Ehlen Road intersection is expected to operate at a level of service "F" in 2010 PM peak hour conditions regardless of site development, which is below Marion County standards. AM peak hour operation would remain at level of service "C". The City of Aurora is considering adding a traffic signal at this intersection in their TSP.

Queuing calculations were prepared for the OR 551 intersections in accordance with ODOT standards using SimTraffic software. The addition of trips from the proposed Helicopter Transport Services facility has little impact on the anticipated queue lengths at the study intersections. Long queues are currently experienced on the Ehlen Road eastbound approach to OR 551, cansed by the lack of a dedicated left turn lane. Both ODOT and Marion County have identified the need for dedicated left turn lanes, which would address the long queues currently occurring.

- Traffic signal warrants presented in the Manual on Uniform Traffic Control Devises were reviewed for the intersection of Ehlen Road with Airport Road, specifically Warrants 1 – Eight Hour Vehicular Volume, 2 – Four Hour Vehicular Volume, and 3 – Peak Hour. ODOT's sixteen hour volumes were used as a basis for review of the eight and four hour warrants. With the addition of site trips, Warrants 1 and 2 not met, and Warrant 3 is just met. Based on this analysis, a traffic signal is not recommended at this time.

  The need for right and left turn lanes at the study area intersections was reviewed using ODOT's turn-lane criterion. Right turn volumes on OR 551 at Keil Road will not meet ODOT's Right Turn Lane Criterion for either AM or PM peak hours.

  No left turn lanes are provided on OR 551 at the intersection with Keil Road. Given the high through volume on the highway, the left turn lane criterion is met with only 10 left turns in an hour. The criterion is met with existing AM peak hour volumes, but not with the PM peak hour volumes for the southbound left turn movement.

- The need for a left tnrn lane was also reviewed on Ehlen Road at the intersection with Airport Road, where no turn lanes are currently provided. The ODOT left turn criterion is met for both the Pre-Development AM and PM peak hour conditions.

MITIGATION MEASURES PROPOSED

With improvements already identified for the intersections of Ehlen Road with OR 551 and Airport Road, and costs that would exceed the proportionate impacts of the Helicopter Transport Services facility, it is recommended the project contribute a proportionate share of planned improvements.

II. INTRODUCTION

This transportation impact analysis has been prepared to support the proposed zone change and Conditional Use Permit for the 126,000 square foot Helicopter Transport Services facility in Aurora, Oregon. The site is currently zoned Exclusive Farm Use (EFU) and the proposed zone is Public (P). An airport use is a conditional use in the Public zone. The subject area is bound by the Aurora Airport to the west, vacant land to the north, Keil Road to the south, and Airport Road to the east. Figure 1 is a vicinity map indicating the property location.

PROJECT DESCRIPTION

The site is approximately 27.48 acres and is identified by Assessor's Map Township 4 Range 1W Section 11 Tax Lot 100 and Township 4 Range 1W Section 12b Tax Lot 400. There are currently two dwelling units on the property.

The Helicopter Transport Services facility is a repair station for the company's helicopters. The company's helicopters are located around the world at different sites, and generally are brought back to this maintenance facility once a year in the late fall (November) for major overhaul and repair during the winter months. After a several month overhaul and repair, the helicopters, pilot crews, mechanics, and fuel tank drivers, then return to service in the spring (April/May) to specific locations based on contract needs for firefighting services with the company's clients. Thus, the activities within the facility are all related to helicopter maintenance. Such use generally includes airframe, rotor, engine, electronics, and radio repair items. In addition, there is supporting administrative and management activities for the helicopter maintenance operation.

During the fire season, which runs from May through October/November, only support staff remain in the building, with an estimate of up to 30 employees working an 8:00 am - 5:00 pm shift. During the off-season, running from November through April, employment at the building will increase to up to 70 employees.

Site access is proposed to Keil Road at several locations. The number and location of access points will be refined based on site conditions and will comply with Marion County access and spacing standards. Figure 2 attached is the preliminary site plan.

SCOPE OF REPORT

As identified in our March 17, 2009 scope letter to Marion County, the zone change from EFU to P does not result in an increase in trip potential. For this reason, only the condition use application is addressed for conditions at buildout of the site.

Due to the project location, both the Marion County and the Oregon Department of Transportation (ODOT) have jurisdiction over certain study area intersections. Based on the March 17, 2009 scope letter, May 14, 2009 trip generation letter and conversations with County staff, the analysis study area includes the following intersections as well as the site access to Keil Road:

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ODOT
- OR 551/Keil Road
- OR 551/Ehlen Road

Marion County
- Airport Road/Keil Road
- Airport Road/Ehlen Road

Analysis was conducted for the AM and PM peak hour for the following scenarios:

- 2009 Existing
- 2010 Pre-Development
- 2010 Post-Development

All correspondence is included in the appendix.

III. EXISTING CONDITIONS

TRANSPORTATION FACILITIES

The following summarizes the study area roadway classifications and descriptions:

TABLE 1 – ROADWAY CHARACTERISTICS						
Roadway	ODOT/City Classification	Posted Speed	Travel Lanes	Bike Lanes	On-Street Parking	Sidewalks
OR 551	Rural Arterial – Regional Hwy	50	2	No	No	No
Ehlen Road	Arterial	35/55	2	No	No	No
Airport Road	Major Collector	35/55	2	No	No	No
Keil Road	Local Road	25	2	No	No	No

Currently, the OR 551/Ehlen Road intersection is signalized. The other intersections are stop controlled for the minor street approach.

Figure 3 illustrates study area intersection existing lane configurations and traffic controls.

EXISTING TRAFFIC COUNTS

Traffic volume data was either collected at the study intersections between 7 AM – 9 AM and 4 AM – 6 PM in April, 2009 or agency supplied. Sixteen hour counts for the intersection of Ehlen Road/Airport Road were conducted by ODOT in 2008 and were used in review of signal warrants for that intersection.

Turning movement counts for OR 551 were not conducted in the peak month (August); therefore, a 3.2% seasonal volume adjustment was made using the 2008 Seasonal Trend Table, in accordance with ODOT standards. Calculations and raw count data are included in the appendix.

Figures 4A and 4B present 2009 intersection traffic volumes including the seasonally adjusted volumes on OR 551.

PLANNED PUBLIC IMPROVEMENTS

ODOT

The Draft 2010-2013 STIP (key number 16121) indicates improvements are scheduled to begin in 2012 at the OR 551/Ehlen Road intersection. Identified improvements include building left turn lanes on Ehlen Road and a traffic separator to limit Boones Ferry to right turns.

Marion County

The Marion County 2005 Rural Transportation Plan, Table 8-5 also identifies improvements are needed at the OR 551/Ehlen Road intersection. Potential improvements may include "*Left Turn Lane on Ehlen; possible realignment; possible traffic signal at Boones Ferry coordinated with State Highway signal*".

City of Aurora
The City of Aurora is currently in the process of a TSP update with public hearings scheduled for July 2009. According to City and County staff, a recommendation for a signal at the Ehlen Road/Airport Road intersection is expected to be included in the TSP.

CRASH ANALYSIS

When evaluating relative intersection safety, consideration is given to the total number and types of crashes occurring and the number of vehicles entering the intersection. This leads to the concept known as "crash rate", usually expressed in terms of the number of crashes occurring per one million vehicles entering the intersection (mev). Intersections having a crash rate less than 1.0/mev are generally considered relatively safe and with crash rates higher than 1.0/mev, consideration may be given to correcting operational problems.

Crash data for the study area intersections were provided by the ODOT Crash Analysis and Reporting Unit (CARU) for January 2003 through December 2007. The following table represents calculated crash rates at the study intersections for the five-year data period. Annual traffic entering the intersections was estimated by multiplying the average daily traffic (ADT) entering the intersection by 365. ADT was estimated by multiplying the intersection PM peak hour volumes by a factor of 10, which coincides with volumes found in the 2007 Oregon State Flow Map.

TABLE 2 – CRASH DATA

Intersection	2004	2005	2006	2007	2008	Total	Crash Rate
OR 551/Keil Road	2	5	1	4	1	13	0.72
OR 551/Ehlen Road	4	2	10	8	7	31	1.09
Airport Road/Keil Road	0	0	0	0	0	0	0.00
Airport Road/Ehlen Road	1	0	0	2	0	3	0.14

All study intersections have crash rates below the 1.0 mev threshold with the exception of the OR 551/Ehlen Road intersection, with a crash rate of 1.09/MEV.

The OR 551/Ehlen Road intersection is currently listed in the ODOT Highway Safety Improvement Program (HSIP) Top 5% Report. The report describes the problem as 43% of crashes turning related, with angle and rear-end type crashes also. It noted the Boones Ferry Road intersection approximately 260 feet to the west causing issues with back to back left turns and traffic backing up through the highway. It lists potential remedies as designated left turn lanes on Ehlen Road and a traffic separator restricting turn movements to and from Boones Ferry Road. The Draft 2010-2013 STIP (key number 16121) indicates improvements are scheduled to begin in 2012. A copy of the HSIP page is located in the appendix.

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IV. PRE-DEVELOPMENT CONDITIONS

IN-PROCESS TRAFFIC VOLUMES

In-process traffic volumes are generated by approved projects not yet complete at the time of this analysis. County Staff has stated there are no significant in-process projects to be included in the analysis.

BACKGROUND TRAFFIC GROWTH

Background growth is general traffic growth not related to specific projects. These volumes represent anticipated growth in the project area over the planning period. Individual neighborhoods and streets may have higher growth rates in the short term, but the overall growth rate is averaged over the planning period.

The background traffic growth rate was based on the Marion County Rural Transportation Systems Plan (RTSP) and Automatic Traffic Recorder (ATR) 24-016 data. The RTSP, Table 6-2, included in appendix, presents anticipated 2025 daily traffic volumes. Growth rates for the study area roadways range from 1.8% to 2.5%.

ATR 24-016 is located 0.22 miles south of Ehlen Road on OR 551. Being near the study area and on the major study area roadway, this ATR is a fair representation of traffic growth in the area. The ATR data presents daily traffic volumes for years 1998-2007. The 10 year growth rate is 2.0% and the 5 year growth rate is 1.0%.

For the purposes of this study a conservative 2.5% growth rate was used for all future year analyses. Figures 5A and 5B illustrates one year of background traffic growth volumes for the AM and PM peak hour.

PRE-DEVELOPMENT TRAFFIC VOLUMES

Pre-Development traffic volumes are the sum of existing traffic volumes and background traffic growth. Figures 6A and 6B presents the 2010 Pre-Development volumes in the AM and PM peak hours.

V. SITE DEVELOPMENT

TRIP GENERATION

The Helicopter Transport use is best categorized using Institute of Transportation Engineers *Trip Generation,* Land Use – 110 (General Light Industrial). Based on the anticipated operation for Helicopter Transport, it is more appropriate to estimate trips based on employees than on building size. For purposes of this analysis, the higher winter employee estimate has been used to provide a "worst case" scenario. Based on discussions with County staff, average trip rates for the peak hour of the generator will be used in the trip generation estimates.

The anticipated trip generation is presented in the following table based on the number of employees.

TABLE 3 – TRIP GENERATION

Land Use (Code)	Employees	ADT	AM Peak Hour			PM Peak Hour		
			Total	Enter	Exit	Total	Enter	Exit
Light Industrial (110)	70	211	34	28	6	36	8	28

The proposed facility is anticipated to generate an additional 211 ADT, 34 AM and 36 PM peak hour trips. Truck trips are expected to be less than 30 per day.

TRIP DISTRIBUTION AND TRAFFIC ASSIGNMENT

Trip distribution and traffic assignment were based on a review study area traffic patterns and engineering judgment. In general, 30% of site trips are anticipated to travel north on OR 551, 10% south on OR 551, 20% both west and east on Ehlen Road, and 10% east on Arndt Road. Figures 7A and 7B illustrate trip distribution and traffic assignment for the AM and PM peak hours, respectively.

POST-DEVELOPMENT TRAFFIC VOLUMES

Post-Development traffic volumes are the sum of Pre-Development and proposed development traffic volumes. Figures 8A and 8B illustrate the 2010 Post-Development traffic volumes for the AM and PM peak hour, respectively.

VI. INTERSECTION AND ROADWAY ANALYSIS

OPERATION ANALYSIS DESCRIPTION

Intersection operation characteristics are generally defined by two measurements: volume-to-capacity (v/c) ratio and level-of-service (LOS). ODOT uses v/c ratio and the County uses LOS and delay to determine intersection performance. Since both agencies have roadways within the project impact area, both measurements are included in the analysis.

V/c ratio is a measurement of capacity used by a given traffic movement for an entire intersection. It is defined by the rate of traffic flow or traffic demand divided by the theoretical capacity. Based on the 1999 Oregon Highway Plan (OHP), OR 551 is a Regional Highway. The OHP requires a maximum v/c ratio of 0.70 be maintained on OR 551 at the study area intersections.

LOS is a measure of the average control delay (in seconds) experienced by drivers at an intersection and is described by a letter on the scale from 'A' to 'F'. LOS 'A' represents optimum operating conditions and minimum delay. LOS 'F' indicates over capacity conditions causing unacceptable delay. LOS 'D' is considered the acceptable minimum by Marion County (Marion County Department of Public Works Transportation Impact Analysis (TIA) Requirements).

PEAK HOUR FACTOR

The peak hour factor (PHF) is used to determine the design hour flow rate and is defined as the ratio of total hourly flow to the peak flow rate within the hour. For analyses contained in this report, 15-minute time increments are used to measure intersection approach volumes; therefore, the PHF is the total hourly volume of all approaches divided by 4 times the peak 15-minute total approach volume. As roads approach capacity, their peak hour factors approach 1.0.

PHFs were calculated for all study area intersections. For the 2010 analysis year, PHFs were assumed to remain consistent with existing 2009 PHFs. PHF calculations are included on the volume summary sheet.

OPERATION ANALYSIS

Operation analysis was conducted for the AM and PM peak hours using Synchro software and the Highway Capacity Manual Methodologies, and following ODOT's Analysis Procedures Manual. The following scenarios were analyzed:

- 2009 Existing
- 2010 Pre-Development
- 2010 Post-Development

In accordance with ODOT standards for areas outside the Portland MPO a saturation flow rate of 1,750 passenger cars per hour of green per lane was used in the analysis. This is consistent with Marion County's standard of 1,800 unless justified by a measurement at that location.

Calculation results are summarized in the following tables. Calculation sheets from the Synchro analysis are included in the appendix.

TABLE 4 – INTERSECTION OPERATIONS										
Intersection	Time Period	2009 Existing			2010 Pre-Development			2010 Post-Development		
OR 551/Keil Road	AM	22.7	0.26	C	23.7	0.27	C	24.9	0.30	C
	PM	31.8	0.28	D	33.7	0.30	D	35.6	0.36	E
OR 551/Ehlen Road	AM	30.0	0.74	C	32.0	0.76	C	32.6	0.77	C
	PM	32.5	0.81	C	35.1	0.83	D	35.6	0.83	D
Airport Road/Keil Road	AM	10.6	0.02	A	10.7	0.02	A	10.7	0.03	A
	PM	10.7	0.09	A	10.8	0.09	B	11.1	0.13	A
Airport Road/Ehlen Road	AM	17.0	0.14	C	17.5	0.15	C	17.9	0.15	C
	PM	46.7	0.75	E	53.6	0.80	F	59.0	0.84	F
Keil Road/Site Access	AM	-	-	-	-	-	-	8.7	0.01	A
	PM	-	-	-	-	-	-	8.8	0.03	A

Signalized/Unsignalized Criteria: Delay-v/c-LOS (unsignalized v/c reported for the critical movement)

The Keil Road approach to OR 551 is anticipated to operate at a 0.36 v/c and a level of service "E" with the addition of site trips. This is consistent with ODOT and Marion County standards for an unsignalized intersection.

The OR 551/Ehlen Road intersection does not meet ODOT's mobility standard of a 0.70 v/c, with an anticipated 0.83 in the PM peak hour pre-development scenario. The addition of site trips does not change the v/c, so no mitigation is required with the project. Both ODOT and Marion County have identified that dedicated left turn lanes are needed at this intersection to improve safety and capacity; identified on ODOT's Draft 2010-2013 STIP .

The Airport Road/Keil Road intersection will continue to operate at a level of service "A" with the addition of site trips.

The Airport Road/Ehlen Road intersection is expected to operate at a level of service "F" in 2010 PM peak hour conditions regardless of site development. AM peak hour operation would remain at level of service "C". The City of Aurora is considering adding a traffic signal at this intersection in their TSP. The project is expected to add 15 PM peak hour trips or a 1.3% increase over existing volumes.

For purposes of this analysis, one access was assumed to Keil Road. The number and locations of site accesses has yet to be determined.

QUEUING ANALYSIS

Queuing calculations were prepared for the OR 551 intersections in accordance with ODOT standards using SimTraffic software. The following table presents the queuing results at each of the study intersections.

TABLE 5 – QUEUE LENGTHS (FEET)								
Intersection	Approach	Movement	2009		2010			
			Existing		Pre-Development		Post-Development	
			AM	PM	AM	PM	AM	PM
OR 551/ Keil Road	EB	Lt, Th, Rt	75	50	50	50	75	75
	WB	Lt, Th, Rt	25	75	50	75	50	75
	NB	Lt, Th, Rt	25	25	25	25	50	25
	SB	Lt	50	25	50	25	75	25
OR 551/ Ehlen Road	EB	Lt, Th, Rt	975	2100	1500	2025	1300	2150
	WB	Lt, Th, Rt	375	300	550	300	300	275
	NB	Lt	125	100	125	75	125	75
		Th	350	275	375	575	425	275
		Rt	50	25	75	25	50	25
	SB	Lt	100	325	75	325	75	300
		Th	175	675	175	750	175	625
		Rt	100	200	100	200	100	200
Airport Road/ Keil Road	EB	Lt, Rt	25	50	25	50	50	50
	NB	Lt	25	0	0	0	0	0
Airport Road/ Ehlen Road	EB	Th, Rt	75	75	75	50	100	75
	SB	Lt, Rt	50	175	75	175	75	175

The addition of trips from the proposed Helicopter Transport Services facility has little impact on the anticipated queue lengths at the study intersections. Long queues are currently experienced on the Ehlen Road eastbound approach to OR 551, caused by the lack of a dedicated left turn lane. Both ODOT and Marion County have identified the need for dedicated left turn lanes, which would address the long queues currently occurring.

SIGNAL WARRANT ANALYSIS

The City of Aurora is currently considering including a traffic signal at the intersection of Ehlen Road with Airport Road in their TSP. Traffic signal warrants presented in the Manual on Uniform Traffic Control Devises were reviewed for this intersection with the post-development traffic volumes. Specifically, Warrants 1 – Eight Hour Vehicular Volume, 2 – Four-Hour Vehicular Volume, and 3 – Peak Hour were reviewed.

For Warrant 1 – Eight Hour Vehicular Volume, ODOT's 16 hour counts were used in the review. The count was conducted in 2008, so two years of background growth were added to the hourly volumes to estimate conditions in 2010, and 10 trips were added to both the minor and major streets (this is a worst case estimate as only 15 PM peak hour trips are added). The volume threshold is only met for three hours for both conditions A and B of the warrant. This warrant is not met, as eight hours must meet the volume thresholds.

Warrant 2 - Four-Hour Vehicular Volume was also reviewed using ODOT's 16 hour counts and the addition of background growth and site traffic. As shown on the warrant figure in the appendix, only three of the hours meet the volume standards. This warrant is not met.

The peak hour warrant was reviewed using PM peak hour volumes for the post-development scenario. The warrant is just met as shown in the attached figure.

With Warrants 1 and 2 not met with development of the site trips, and Warrant 3 just met, a signal is not recommended at this time.

Copies of the warrant worksheets and volume summaries are included in the appendix.

TURN LANE WARRANT ANALYSIS

The need for right and left turn lanes at the study area intersections was reviewed using ODOT's turn-lane criterion.

No right turn lane is currently provided on OR 551 at Keil Road northbound. With development of the site, volumes will not meet ODOT's Right Turn Lane Criterion for either AM or PM peak hours. ODOT's right turn figure is included in the appendix.

No left turn lanes are provided on OR 551 at the intersection with Keil Road. Given the high through volume on the highway (over 900 AM and 1200 PM vehicles per hour in both directions), the left turn lane criterion is met with only 10 left turns in an hour. Pre-development conditions include 23 AM peak hour. The addition of site trips increases the AM left turn volume to 29 trips. The PM volumes are only 6 left turns in the pre-development scenario, and 8 left turns with the addition of site trips. Only the AM peak hour volume meets the Left Turn Lane Criterion.

The need for a left turn lane was also reviewed on Ehlen Road at the intersection with Airport Road, where no turn lanes are currently provided. The ODOT left turn criterion is met for both the pre-development AM and PM peak hour conditions.

PEDESTRIAN AND BICYCLE

None of the roadways within the study area have striped bike lanes or sidewalks. A paved shoulder is currently provided on Ehlen Road.

VII. MITIGATION

The intersections of Ehlen Road with OR 551 and Airport Road currently do not meet operating standards even without the proposed Helicopter Transport Services facility. The project will add less than 2% to these intersections and have little impact above the pre-development conditions. Both intersections have improvements identified, including a traffic signal at Airport Road and dedicated left turn lanes at Ehlen Road. A warrant analysis indicates a traffic signal is not needed with the addition of site trips.

Existing traffic volumes at the intersection of OR 551 meet ODOT's left turn criterion for the AM peak hour. The site will add to the southbound left turn movement, increasing from the existing 22 to 29 left turns.

Costs for all of the identified future improvements would likely exceed the proportionate impacts of the Helicopter Transport Services facility. Therefore, it is recommended that the project contribute a proportionate share of planned improvements.

VIII. SUMMARY

This transportation impact analysis has been prepared to support the proposed zone change and Conditional Use Permit for the 126,000 square foot Helicopter Transport Services facility in Aurora, Oregon. The site is currently zoned Exclusive Farm Use (EFU) and the proposed zone is Public (P). An airport use is a conditional use in the Public zone. The 27.48 acre site is bound by the Aurora Airport to the west, vacant land to the north, Keil Road to the south, and Airport Road to the east. There are currently two dwelling units on the property.

As identified in our March 17, 2009 scope letter to Marion County, the zone change from EFU to P does not result in an increase in trip potential. For this reason, only the condition use application is addressed for conditions at buildout of the site. Both Marion County and the Oregon Department of Transportation (ODOT) have jurisdiction over study area intersections. This analysis addresses requirements of both jurisdictions. Analysis was conducted for the AM and PM peak hour for the 2009 Existing, 2010 Pre-Development and 2010 Post-Development.

The Helicopter Transport Services facility is a repair station for the company's helicopters. The company's helicopters are located around the world at different sites, and generally are brought back to this maintenance facility once a year in the late fall for major overhaul and repair during the winter months. After a several month overhaul and repair, the helicopters, pilot crews, mechanics, and fuel tank drivers, then return to service in the spring to specific locations based on contract needs for firefighting services with the company's clients. Thus, the activities within the facility are all related to helicopter maintenance. In addition, there is supporting administrative and management activities for the helicopter maintenance operation.

During the fire season which runs from May through October/November, only support staff remain in the building, with an estimate of up to 30 employees working an 8:00 AM -5:00 PM shift. During the off-season, running from November through April, employment at the building will increase to up to 70 employees.

The site plan and access locations are still in development. Access will be provided to Keil Road, and will comply with Marion County access and spacing standards.

Traffic volume data was either collected at the study intersections between 7 AM – 9 AM and 4 AM – 6 PM in April 2009, and sixteen hour counts for the intersection of Ehlen Road/Airport Road were conducted by ODOT in 2008. A seasonal volume adjustment was made to OR 551 volumes using the 2008 Seasonal Trend Table, in accordance with ODOT standards.

Improvements are planned at the OR 551/Ehlen Road intersection, as noted in the Draft 2010-2013 STIP (key number 16121), to include building left turn lanes on Ehlen Road and a traffic separator to limit Boones Ferry to right turns. The Marion County 2005 Rural Transportation Plan, Table 8-5 also identifies improvements are needed at the OR 551/Ehlen Road intersection. Potential improvements may include "*Left Turn Lane on Ehlen; possible realignment; possible traffic signal at Boones Ferry coordinated with State Highway signal*".

The City of Aurora is currently in the process of a TSP update with public hearings scheduled for July 2009. According to City and County staff, a recommendation for a signal at the Ehlen Road/Airport Road intersection is expected to be included in the TSP.

Crash data for the study area intersections were reviewed to determine crash rates. Only the intersection of OR 551 with Ehlen Road has a crash rate above 1.0 crashes per million entering vehicles, as has been noted in the ODOT Highway Safety Improvement Program (HSIP) Top 5% Report. The planned left turn improvements are expected to address the high crash rate.

Pre-development traffic conditions were estimated by adding one year of 2.5% background growth to existing volumes. County staff has stated there are no significant in-process projects to be included in the analysis.

Trip generation estimates for the Helicopter Transport Services facility were prepared using Institute of Transportation Engineers *Trip Generation,* Land Use – 110 (General Light Industrial) based on the anticipated peak seasonal 70 employees.

Based on discussions with County staff, average trip rates for the peak hour of the generator will be used. A total of 211 daily, 34 AM peak hour and 36 PM peak hour trips are anticipated. Truck trips are expected to be less than 30 per day.

Capacity calculations were prepared in accordance with ODOT standards using Synchro software, which follows the Highway Capacity Manual methodologies.

The intersection of OR 551 with Ehlen Road does not currently meet ODOT standards of v/c 0.70, and the addition of site trips does not decrease the v/c in the critical PM peak hour. Improvements have been identified for this intersection to include left turn lanes on Ehlen Road.

The Airport Road/Ehlen Road intersection is expected to operate at a level of service "F" in 2010 PM peak hour conditions regardless of site development, which is below Marion County standards. AM peak hour operation would remain at level of service "C". The City of Aurora is considering adding a traffic signal at this intersection in their TSP.

Queuing calculations were prepared for the OR 551 intersections in accordance with ODOT standards using SimTraffic software. The addition of trips from the proposed Helicopter Transport Services facility has little impact on the anticipated queue lengths at the study intersections. Long queues are currently experienced on the Ehlen Road eastbound approach to OR 551, caused by the lack of a dedicated left turn lane. Both ODOT and Marion County have identified the need for dedicated left turn lanes, which would address the long queues currently occurring.

Traffic signal warrants presented in the Manual on Uniform Traffic Control Devises were reviewed for the intersection of Ehlen Road with Airport Road, specifically Warrants 1 – Eight Hour Vehicular Volume, 2 – Four-Hour Vehicular Volume, and 3 – Peak Hour. ODOT's sixteen hour volumes were used as a basis for review of the eight and four hour warrants. With the addition of site trips, Warrants 1 and 2 not met, and Warrant 3 is just met. Based on this analysis, a traffic signal is not recommended at this time.

The need for right and left turn lanes at the study area intersections was reviewed using ODOT's turn-lane criterion. Right turn volumes on OR 551 at Keil Road will not meet ODOT's Right Turn Lane Criterion for either AM or PM peak hours.

No left turn lanes are provided on OR 551 at the intersection with Keil Road. Given the high through volume on the highway, the left turn lane criterion is met with only 10 left turns in an hour. The criterion is met with existing AM peak hour volumes, but not with the PM peak hour volumes for the southbound left turn movement.

The need for a left turn lane was also reviewed on Ehlen Road at the intersection with Airport Road, where no turn lanes are currently provided. The ODOT left turn criterion is met for both the pre-development AM and PM peak hour conditions.

With improvements already identified for the intersections of Ehlen Road with OR 551 and Airport Road, and costs that would exceed the proportionate impacts of the Helicopter Transport Services facility, it is recommended the project contribute a proportionate share of planned improvements.

IX. APPENDIX

A. Figures
B. Traffic Count Summaries
C. Crash Data
D. Background Growth
E. Capacity Calculations
F. Queuing Calculations
G. Warrant Analysis
H. Marion County and ODOT Scoping

CHAPTER 1: INTRODUCTION AND SUMMARY

This study evaluates the transportation impacts for the proposed Fred Meyer development located on the northeast corner of Boones Ferry Road and Bailey Street in the City of Wilsonville, Oregon. It also recommends mitigation measures to offset the impacts.

The currently proposed development includes a 155,881 square-foot Fred Meyer building (which includes the Fred Meyer store as well as 10,100 square feet of additional tenant space[1]), six other buildings (which include 50,879 square feet of retail/office use and a 3,316 square-foot restaurant), and 60 residential apartment units.[2] The site has four access points to the public street system: two on SW Boones Ferry Road and two on SW Bailey Street.

The study area for the project is shown in Figure 1 and was determined based on discussions with City staff. Within the study area, there are seven study intersections where traffic operations are analyzed:

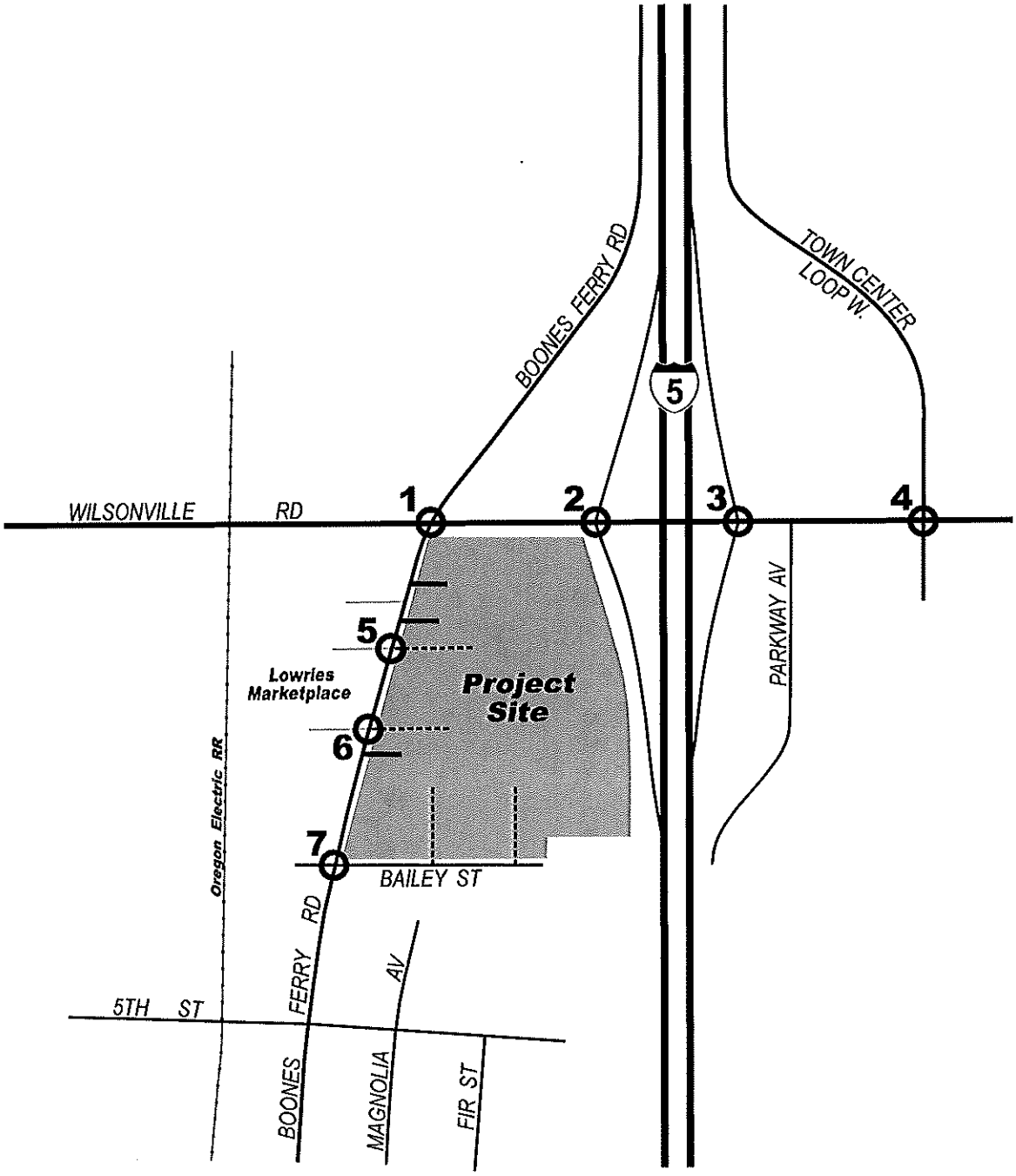
- Boones Ferry Road/Wilsonville Road
- I-5 Southbound Ramps/Wilsonville Road
- I-5 Northbound Ramps/Wilsonville Road
- Town Center Loop West/Wilsonville Road
- Boones Ferry Road/Fred Meyer north access
- Boones Ferry Road/Fred Meyer south access
- Boones Ferry Road/Bailey Street

Project traffic impacts were evaluated at the study intersections for the weekday PM peak hour. The impact analysis includes trip generation, trip distribution, PM peak hour project trips through the two City of Wilsonville I-5 interchange areas, and future traffic operating conditions. The analysis also accounts for developments in the area that have Stage II approval, including those under construction but not yet occupied. Recommended mitigations are then described and analyzed. Included in the mitigations section of Chapter 3 is a conceptual cross-section layout for Boones Ferry Road between Bailey Road and Wilsonville Road (see Figure 5).

Other issues addressed in this report include Saturday peak hour safety analysis and a project site evaluation (which addresses access location and spacing), sight distance, project frontage adjustments, traffic signal warrants, internal circulation, and parking. At the end of the report, a summary is presented of the recommended transportation mitigation measures that are expected to offset the negative transportation impacts of future traffic growth.

Table 1 lists important characteristics of the study area and proposed project.

[1] Tenant space within a Fred Meyer building is typically occupied by businesses providing additional goods or services, such as coffee shops or banks.
[2] Email from Christine McKelvey, Group Mackenzie, July 2, 2008.



LEGEND

1 - Study Intersection & Number

-------- - Proposed Fred Meyer Driveway

———— - Existing Lowries Driveway

▬▬ - Existing Driveway to be Removed

DKS Associates
TRANSPORTATION SOLUTIONS

NO SCALE

Figure 1

STUDY AREA

DKS Associates
TRANSPORTATION SOLUTIONS

TABLE 1: Study Area and Proposed Project Characteristics

Study Area	
Number of Study Intersections	7
Analysis Periods	Weekday PM Peak (4:00 p.m. to 6:00 p.m.) Saturday Midday Peak (11:00 a.m. to 1:00 p.m.)
Proposed Development	
Total Weekday PM Peak Hour Project Trips	1,255 (627 in, 628 out)
Non Pass-by[a] Weekday PM Peak Hour Project Trips	937 (468 in, 469 out)
Net New Weekday PM Peak Hour Project Trips	488 (244 in, 244 out)
Estimated Weekday PM Peak Hour Project Trips Through I-5/Wilsonville Road Interchange[b]	612 (768 new trips – 156 grandfathered trips)
Estimated Weekday PM Peak Hour Project Trips Through I-5/Elligsen Road Interchange	2
Vehicle Access Points	Four full access points: two on SW Boones Ferry Road and two on SW Bailey Street.
Project Vicinity	
Pedestrian Facilities	Sidewalks to be constructed along project frontage of Boones Ferry and Bailey Street with connection to Wilsonville Road.
Bicycle Facilities	Sidewalks and bike lanes on Boones Ferry Road and Wilsonville Road
Nearest Transit Stop	Boones Ferry Road (SMART Routes 1X and 203)

[a] Non-Pass-by project trips account for pass-by and internal trip reductions.
[b] The Wilsonville Road interchange area includes the Boones Ferry Road/Wilsonville Road intersection. Some of the new project trips that pass through this intersection are diverted trips.

Project Traffic Impact

To determine project impact at the study intersections, traffic operating conditions were analyzed at the study intersections during the weekday PM peak hour for the following four scenarios:

- Existing Conditions
- Existing plus Project
- Existing plus Stage II
- Existing plus Project plus Stage II

The study intersection operating conditions (assuming the existing roadway network) for the "Existing," "Existing plus Stage II," and "Existing plus Project plus Stage II" scenarios are listed in Table 2. Under existing conditions, all study intersections meet the City of Wilsonville LOS "D" standard and the Oregon Department of Transportation (ODOT) 0.99 volume-to-capacity (V/C) standard during the PM peak hour. With the addition of stage II traffic, both northbound and southbound ramps exceed operating standards. When project traffic is also added, all four study intersections on Wilsonville Road exceed operating standards. In addition, the two Fred Meyer development accesses on Boones Ferry Road operate below desired levels.

TABLE 2: Study Intersection Operating Conditions (PM Peak Hour)

Intersection	Operating Standard	Existing Conditions			Existing + Stage II			Existing + Stage II + Project		
		Delay	*LOS*	*V/C*	*Delay*	*LOS*	*V/C*	*Delay*	*LOS*	*V/C*
Signalized										
Boones Ferry Rd / Wilsonville Rd	LOS D	36.0	D	0.77	44.5	D	0.89	>80	**F**	>1.0
I-5 SB Ramps / Wilsonville Rd	LOS D, 0.99 V/C	36.1	D	0.90	79.1	**E**	**>1.0**	>80	**F**	**>1.0**
I-5 NB Ramps / Wilsonville Rd	LOS D, 0.99 V/C	37.2	D	0.91	70.9	**E**	**>1.0**	>80	**F**	**>1.0**
Town Center Loop W / Wilsonville Rd	LOS D	37.7	D	0.80	51.2	D	0.94	56.2	**E**	0.97
Unsignalized										
Boones Ferry Rd / North Project Access	-	12.7	A/B	0.13	13.9	A/B	0.18	>50	A/F	>1.0
Boones Ferry Rd / South Project Access	-	11.9	A/B	0.14	12.4	A/B	0.15	>50	A/F	0.71
Boones Ferry Rd / Bailey St	LOS D	10.9	A/B	0.06	11.6	A/B	0.06	13.8	A/B	0.12

Signalized intersections:
Delay = Average Stopped Delay per Vehicle (sec) for All Movements
LOS = Level of Service of Intersection
V/C = Volume-to-Capacity Ratio of Intersection
Bold Underlined values do not meet standards.

Unsignalized intersections:
Delay = Average Stopped Delay per Vehicle (sec) at Worst Movement
LOS = Level of Service of Major Street/Minor Street
V/C = Volume-to-Capacity Ratio of Worst Movement
Bold Underlined values do not meet standards.

Planned Wilsonville Road Improvements

Due to capacity constraints at the I-5/Wilsonville Road interchange, improvements are planned that will provide additional capacity along Wilsonville Road between Boones Ferry Road and Town Center Loop West. Recently, the City has signed an intergovernmental agreement to construct the first phase of improvements, which will consist of a Wilsonville Road 6-lane enhanced alternative that focuses on ramp improvements and on adjustments to intersection lane configurations.

For the four study intersections on the Wilsonville Road corridor, a Synchro™ model of the improved Wilsonville Road cross-section was used to analyze intersection operating conditions for each of the three

future PM peak hour traffic scenarios (i.e., "Existing plus Project", "Existing plus Stage 2", and "Existing plus Project plus Stage 2"). The results of the analysis are listed in Table 3. As shown in the table, all four study intersections on Wilsonville Road comply with the City of Wilsonville LOS D operating standard for each of the three scenarios. The two I-5 ramps also meet the Oregon Department of Transportation (ODOT) 0.99 volume-to-capacity (V/C) standard.

TABLE 3: Future Operating Conditions of Wilsonville Road Intersections with Six-Lane Enhanced Alternative Improvements (PM Peak Hour)

Intersection	Operating Standard	Existing + Project + Improvements			Existing + Stage II + Improvements			Existing + Project + Stage II + Imps.		
		Delay	*LOS*	*V/C*	*Delay*	*LOS*	*V/C*	*Delay*	*LOS*	*V/C*
Signalized										
Boones Ferry Rd / Wilsonville Rd	LOS D	37.7	D	0.66	31.1	C	0.67	39.3	D	0.75
I-5 SB Ramps / Wilsonville Rd	LOS D	20.6	C	0.64	22.0	C	0.72	22.7	C	0.76
I-5 NB Ramps / Wilsonville Rd	LOS D	22.9	C	0.64	23.6	C	0.74	24.7	C	0.78
Town Center Loop W / Wilsonville Rd	LOS D	35.7	D	0.66	40.3	D	0.75	43.2	D	0.78

Delay = Average Stopped Delay per Vehicle (sec)
LOS = Level of Service of Intersection
V/C = Volume-to-Capacity Ratio of Intersection
Bold Underlined values do not meet standards.

Project Impact Mitigations

To mitigate impacts at the north and south project accesses onto Boones Ferry Road, three Boones Ferry Road site frontage improvements are needed (these are in addition to the planned improvements to Boones Ferry Road that are shown on the Fred Meyer site plan):

- At the north Fred Meyer access, install a median along Boones Ferry Road to restrict movements to right-in/right-out for both the Lowries Marketplace and Fred Meyer developments; this will increase safety by removing turn lane needs at this access and will provide for better traffic flow (i.e. queuing spillback that impact Wilsonville Road). It will also accommodate turn lane placement and storage needs for the Boones Ferry Road/Wilsonville Road intersection's northbound approach traffic. Also, if desired, the north Fred Meyer access may be converted to a right-out only driveway and narrowed to one lane, which would allow additional space on the project site that could be used to increase a building pad size, the number of parking stalls, etc.
- Between the north and south Fred Meyer accesses, extend the second northbound through lane (which becomes a right turn lane at the Wilsonville Road intersection) to ensure approximately 600 feet of storage is provided for the northbound right turn lane at Wilsonville Road. This distance meets the short-term Fred Meyer needs and the long-term 20-year Wilsonville Road Interchange design needs.
- At the south Fred Meyer access, install a traffic signal to facilitate egress movements from the Lowries and Fred Meyer developments. There should also be two egress lanes (i.e., a right turn lane and a through-left lane). It is expected that warrants will be met in the near future due to the

addition of nearby developments. Installing the traffic signal with the Boones Ferry Road improvements will assure continuity between the improvements and the traffic signal construction. The signal should be coordinated with the Boones Ferry Road/Wilsonville Road signal. To enable the coordination, interconnect conduit and cable will need to be installed between the signals.

A conceptual layout of Boones Ferry Road that shows all improvements and mitigations is presented in Figure 5, which can be found in Chapter 3: Impact Analysis. The mitigated analysis results are listed in Table 4 for the north Fred Meyer access and the Boones Ferry Road/Bailey Street intersection and in Table 5 for both traffic control options at the south access (i.e., a traffic signal and four-way stop control). As shown in the tables, the three intersections have good operation levels and the two traffic control options for the south access are comparable to one another. The main benefits from the installation of the traffic signal are the ability to service platoon flow from the Boones Ferry Road/Wilsonville Road intersection and increased future capacity that will be available.

TABLE 4: Boones Ferry Road Mitigated Future Operating Conditions (PM Peak Hour)

Intersection	Operating Standard	Existing + Project + Stage II + Mitigated		
		Delay	*LOS*	*V/C*
Unsignalized – Two-way Stop Control				
Boones Ferry Rd / North Project Access	-	13.8	A/B	0.41
Boones Ferry Rd / Bailey St	LOS D	17.0	A/C	0.15

Delay = Average Stopped Delay per Vehicle (sec) at Worst Movement
LOS = Level of Service of Major Street/Minor Street
V/C = Volume-to-Capacity Ratio of Worst Movement
Bold Underlined values do not meet standards.

TABLE 5: South Project Access Mitigated Future Operating Conditions (PM Peak Hour)

Traffic Control at South Project Access	Existing + Project + Mitigated		
	Delay	*LOS*	*V/C*
Signalized (Option 1)	22.0	C	0.49
Four-way Stop Control (Option 2)	20.1	C	0.75

Delay = Average Stopped Delay per Vehicle (sec) for All Movements
LOS = Level of Service of Intersection
V/C = Volume-to-Capacity Ratio of Intersection
Bold Underlined values do not meet standards.

Additional Project Oriented Transportation Mitigations

In addition to the Boones Ferry Road mitigations, the following project related measures would typically be required as conditions of approval if the project were approved:

Site Accesses

- The south Fred Meyer access on Boones Ferry Road should be aligned with the south Lowries Marketplace driveway (i.e., near Albertsons). In addition, regarding the Fred Meyer accesses on Bailey Street, the east access should be aligned with the driveway on the south side of the street and the west access should be located in a manner that it does not create conflicting turn movements with any nearby driveways on the south side of the street.
- The radius for the right-out movement at the north access on Boones Ferry Road should be designed to allow trucks to perform a right turn without encroaching on neighboring lanes.

Intersection Alignment

- Improvements to the Boones Ferry Road/Bailey Street intersection should be constructed to ensure that the east and west legs of Bailey Street are properly aligned (these legs currently are offset).

Sight Distance

- All proposed site driveways should meet American Association of State Highway and Transportation Officials (AASHTO) sight distance requirements[3], and prior to occupancy, sight distance at the access points will need to be verified, documented, and stamped by a registered professional Civil or Traffic Engineer licensed in the State of Oregon.
- The sight triangle at each driveway should be clear of objects (large signs, landscaping, parked cars, etc.) that could potentially limit vehicle sight distance.

Boones Ferry Road Adjustments

- The Fred Meyer development site frontage will require adjustments to accommodate the increased cross-section on Boones Ferry Road (as shown in Figure 5, which is found in Chapter 3: Impact Analysis). Adjustments at the southwest corner of the site may also be needed to ensure that the east and west legs of the Boones Ferry Road/Bailey Street intersection are properly aligned (currently, these legs are offset). Because the site plan does not show the curb locations on the west side of Boones Ferry Road or south side of Bailey Street, it is not clear what exact adjustments are needed.

Internal Circulation

- Site plan changes are recommended to convert the south access into the main access. One optional method for making the conversion is presented in Figure 8 (found in Chapter 5: Site Evaluation), which shows two conceptual changes: (1) realigning the internal roadways so that priority is given to vehicles coming and going to the south access and (2) installing four-way stop-control at the internal intersection near the south access.
- The site plan is not clear in the vicinity of the buildings, but it appears that the site would provide adequate pedestrian circulation. It should be ensured that the site indeed provides pedestrian access to the buildings and to the nearby crosswalks and paths (in particular, to the paths on the north side of the site that connect to Wilsonville Road).
- All sidewalks within the site should conform to ADA requirements.[4]

[3] *Geometric Design of Highways and Streets,* AASHTO, 2004; Case B1, p. 661.
[4] *ADA Accessibility Guidelines for Buildings and Facilities,* Department of Justice, January 1998.

Traffic Signal Warrants

- Though signal warrants are not met at any unsignalized study intersection for the "Existing plus Project plus Stage II" scenario, it was determined that the peak hour warrant will be met in the near future at the south Fred Meyer access; therefore, a traffic signal should be installed in conjunction with the Fred Meyer development. This will assure continuity between the Boones Ferry Road improvements and the traffic signal construction. The signal should be coordinated with the Boones Ferry Road/Wilsonville Road signal. To enable the coordination, interconnect conduit and cable will need to be installed between the signals.

Parking

- The proposed site provides only 885 parking stalls. This is not sufficient to meet City of Wilsonville code requirements, which specifies that a minimum of 962 stalls should be provided (based on the types of uses and the total building square footage of each use). During peak parking periods (such as holiday shopping periods), not meeting code requirements may cause parking demand to exceed the number of available stalls and oblige vehicles to park in adjacent commercial and/or residential areas; therefore, either 962 parking stalls should be provided to reduce potential off site parking impacts or a parking management plan should be prepared outlining how peak parking demand needs shall be met.
- The 138 bicycle parking spaces meet City code requirements and should be distributed throughout the development and should be located near building entrances in order to provide convenient access to each building.

PFB15.	Sidewalks and pedestrian linkages shall be in compliance with the ADA Accessibility Guidelines (ADAAG), as amended in 2004, and the 2005 Draft Public Rights-of-Way Accessibility Guidelines.
PFB16.	Prior to the City issuing a construction permit, the applicant shall submit the sanitary sewer construction plans to the Department of Environmental Quality for review and approval.
PFB17.	No surcharging of sanitary or storm water manholes is allowed.
PFB18.	The project shall connect to an existing manhole or install a manhole at each connection point to the public storm system and sanitary sewer system.
PFB19.	A City approved energy dissipation device shall be installed at all proposed storm system outfalls. Storm outfall facilities shall be designed and constructed in conformance with the Public Works Standards.
PFB20.	The applicant shall provide a 'stamped' engineering plan and supporting information that shows the proposed street light locations meet the appropriate AASHTO lighting standards for all proposed streets and pedestrian alleyways.
PFB21.	All required pavement markings, in conformance with the Transportation Systems Plan and the Bike and Pedestrian Master Plan, shall be completed in conjunction with any conditioned street improvements.
PFB22.	The proposed site plan and landscape plan shall depict adequate sight distance at all project driveways. The applicant shall maintain all landscaping to ensure that it does not interfere with adequate sight distance requirements at any project driveway.
PFB23.	Access requirements, including sight distance, shall conform to the City's Transportation Systems Plan (TSP) and be approved by the City Engineer.
PFB24.	Applicant shall design interior streets and aisles to meet specifications of Tualatin Valley Fire & Rescue, Allied Waste Management (United Disposal) and South Metro Area Regional Transit (SMART) for access and use of their vehicles.
Specific Comments:	
PFB25.	At the request of Staff, DKS Associates completed a Transportation Impact Study (TIS) dated November 22, 2004. This study looked at a 166,887 s.f. Fred Meyer store with additional 9,000 s.f. of retail pads and a 6,000 s.f. restaurant; total proposed development of 182,000 s.f.. At the request of staff, a new TIS was completed by DKS dated August 19, 2008. This new study looked at a 165,981 s.f. Fred Meyer building with an additional 51,879 s.f. of retail/office pads, a 3,316 s.f. restaurant and 60 residential apartment units; total proposed development of 221,176 s.f. plus 60 residential apartments. The applicant's traffic consultant has suggested a different methodology for calculating trips. Pursuant to the DKS study, the project is estimated to generate the following traffic impacts. Estimated Weekday PM Peak Hour Trips 1,255 Estimated Weekday PM Peak Hour Trips 768 Through Wilsonville Road Interchange Area Allowing for grandfathered trips from U.S. Bank and the demolished gas station, as well as accounting for pass-by trips and internal trips, the project is hereby limited to no more than the following impacts. Estimated Net New Weekday PM Peak Hour Trips 728 Estimated Weekday Net New PM Peak Hour Trips 612 Through Wilsonville Road Interchange Area
PFB26.	Applicant shall dedicate to the City sufficient rights-of-way along frontage on Boones Ferry Road to allow construction of the roadway sections as shown in Figure 5 of the DKS TIS

	report and from material submitted by the Old Town Square development team, specifically: From Wilsonville Road to north access driveway: 5-lane section (12-ft travel lanes and 14-ft northbound left turn lane with minimum 5-ft landscape median/pedestrian refuge) with two 5-ft bike lanes and on east side from back of rainwater flow-through planter a minimum 10-ft sidewalk/landscape area. From north access driveway to south access driveway: 4-lane section (12-ft travel lanes and 14-ft southbound left turn lane with minimum 5-ft landscape median/pedestrian refuge), with two 5-ft bike lanes, and on east side from back of rainwater flow-through planter a minimum 10-ft sidewalk/landscape area. From south access driveway to Bailey Street: 3-lane section (12-foot travel lanes with 14-ft northbound and southbound left turn lanes with minimum 5-ft landscape median/ pedestrian refuge), with two 5-ft bike lanes, and on east side from back of curb a 10-ft sidewalk/landscape area.
PFB27.	Applicant shall dedicate to ODOT/City of Wilsonville sufficient rights-of-way along frontage on Wilsonville Road to allow construction of a second westbound 14-ft left turn lane and a third eastbound 12-ft travel lane, and from back of curb a 12-ft wide sidewalk/landscape area.
PFB28.	Applicant shall dedicate to the City sufficient rights-of-way along frontage on Bailey Street to allow construction of the roadway section as shown in material submitted by the Old Town Square development team and from back of curb a 5-ft wide sidewalk area.
PFB29.	On Bailey Street, left turn pockets shall meet recommended lengths as determined by DKS Associates and approved by the City. Center lane areas not required for queue lengths shall be constructed as landscape medians.
PFB30.	Applicant shall provide sufficient PUE to allow the franchise utilities to construct necessary improvements, including installation of vaults, peds, conduit, and/or other facilities needed. Applicant shall coordinate on-site landscaping and pedestrian areas to incorporate the franchise utility improvements. The City will allow PGE to have conduit and cable in the easternmost 4 feet of the proposed Boones Ferry Road right-of-way.
PFB31.	Access to public rights-of-way shall be limited to the two proposed driveways on Boones Ferry Road and the two proposed driveways on Bailey Street. Proposed southern access driveway to Boones Ferry Road shall align centerlines with driveway on opposite side of roadway. Proposed eastern driveway to Bailey Street shall align centerlines with driveway on opposite side of the roadway.
PFB32.	The northern access driveway to Boones Ferry Road shall be limited to right-in / right out traffic movement only. The other three proposed driveways are allowed to have full turning access.
PFB33.	Applicant shall place adequate signage at the north and south access driveways on Boones Ferry Road to indicate the truck turning movements and prohibited movements as shown on submitted material.
PFB34.	The northern access driveway to Boones Ferry Road shall be designed with a sufficient radius to allow egress by WB65 trucks with limited impact on the middle travel lane and no impact on adjacent pedestrian sidewalks.
PFB35.	At the eastern access driveway to Bailey Street, material submitted indicates ingress turning movements for WB-65 trucks and buses are made from the through travel lane and not the left turn lane, and even so the movements are shown to conflict with the egress left turn lane. Applicant shall redesign this entrance so as to eliminate these conflicts and turning movements are made in a legal manner consistent with the Oregon Vehicular Code.

Appendix K:
PREFERRED ALTERNATIVE INPUT

Airport Master Plan Update

Aurora State Airport

WHPacific
OREGON DEPARTMENT OF AVIATION

Aurora State Airport Master Plan

Planning Advisory Committee (PAC) Meeting #4

March 10, 2011
North Marion Intermediate School, Aurora, OR

MEETING SUMMARY

Attendees

Oregon Department of Aviation (ODA) – Chris Cummings, Sandra Larsen and Mitch Swecker (also a PAC member)

WHPacific – Rainse Anderson, Sara Funk, Sarah Lucas and Casey Storey

JLA Public Involvement – Vaughn Brown, Adrienne Dedona and Sylvia Ciborowski

Public Advisory Committee (PAC) – Bruce Bennett, Jim Bernard, Jim Hansen, Tony Holt, Steve Hurst, Nick Kaiser, Rick Kosta, James Meirow, Ted Millar, Fred Netter, Dan Riches, Ray Phelps, Charlotte Lehan (for Jim Bernard), Craig Wilmes and Dave Waggoner.

Public Attendees – see attached sign in sheets

Welcome and Introductions

Chris Cummings, ODA, introduced himself and welcomed everyone to the meeting. He noted this meeting had the best public turnout so far.

Chris reviewed the meeting agenda, explaining there would be a presentation from WHPacific prior to breaking out into a public workshop. After the workshop, the PAC will reconvene for a discussion of the alternatives. Chris instructed participants to ask as many questions as possible during the workshop and indicated that there is also the opportunity to provide written comments.

Rainse Anderson, WHPacific, introduced himself and provided an overview of the study to date. He noted that at previous meetings he had told members several times to hold their comments until we review Chapter 5. Rainse explained that Chapter 5 and the draft alternatives is what we've been building up to. He said reviewing and discussing the draft alternatives in order to develop a preferred alternative is the most exciting and important part of the study. Rainse asked the remainder of the consultant team to introduce themselves and reminded everyone to sign in. He drew attention to the comment form and let people know this would be a helpful guide when reviewing the draft alternatives.

Rainse reviewed the agenda further and explained there would be a review of the forecast updates, traffic analysis and the draft alternatives prior to the public workshop. He also said there would be a discussion of the alternatives with the PAC, and at the end of the meeting, there will be time for public comments.

Presentation

Project Overview: Rainse reviewed the project purpose and explained that there are seven (7) chapters total in the Master Plan Update. The first four draft chapters have been completed and draft chapter 5 will be reviewed tonight. Following completion of the document, the draft will be submitted to FAA for review. This process typically takes 90 days prior to final publication. After this meeting, the project team will take the feedback received and begin developing the preferred alternative. The draft preferred alternative will include a public review and comment period. Once that is completed, the Airport Layout Plan (ALP) and the Capital Improvement Plan (CIP) will be developed. The ALP and CIP will be the topics for review and discussion at the next PAC meeting; tentatively scheduled for the end of June.

Traffic Analysis: Rainse said that at the first PAC meeting there was a discussion about vehicular traffic and since that time, the project team has done some analysis to look at traffic coming from and around the airport. He explained that this data was gathered from various available sources. ODOT traffic specialists were enlisted to conduct counts around the airport. Data was gathered at 11 of the gates in during a 1 week period to determine the average annual daily traffic (AADT) and peak hour traffic volumes. The result was 2,400 AADT. Located at the NE corner, Columbia Helicopters generates 47% of the total traffic (1,130 AADT). Rainse explained that this is not a typical Fixed Base Operator (FBO) tenant since they don't use the runway. The traffic analysis included HTS (Helicopter Transport Services), under construction on the corner of Keil and Airport Road, and projected 211 AADT once developed. On Airport Road itself, 2007 data shows that approximately 2,600 vehicles travel along the road between Ehlen and Arndt Road. Rainse mentioned that this data is somewhat low; when it is updated in 2011, it's expected to increase. The data will be updated by studies completed by Marion County later this year. Rainse went on to explain that there is a lot of pass-through traffic going to and from I-5. He added that the impact from the airport on the Boone Bridge was also analyzed and it was determined that the airport generates about 1.5% of the total traffic on the bridge. Currently the employment numbers at the airport are approximately 750 employees, which equates to 3.2 trips per employee. Once a 1.19% annual employment growth rate is applied, the total employment for 2030 is 950 employees, equating to an airport generated AADT of 3,040. Rainse added that additional data and background information on the traffic analysis can be found in the report and could be discussed further during the workshop session.

Traffic Analysis Recommendations: Rainse said that ODA will continue to work with Marion County and the City of Aurora as improvements to Airport Road are considered and the appropriate considerations will have to be made with regard to airport businesses and entrances along Airport Road. He added that it is likely that there will be sharing of the costs in the system development, similar to what HTS did with their system development, but this will need to be worked out between the entities.

Forecast Updates: Chris explained that the previous meeting scheduled for February was postponed because of incorrect forecast information that needed to be corrected. There was an error with previous information related to the number of aircraft based at the airport. To remedy the problem, ODA checked with tenants, sent someone out to physically count aircraft in hangars (if able), and thoroughly reviewed their database of registered aircraft. Chris said there are now new numbers and those numbers have gone down from the original count. He said this information was used to go back and correct other information previously developed in the report. Chris said that he is very confident with the count and the new forecast.

Sara Funk said that while they were doing revisions based on the aircraft count, they completed other revisions, such as:

- Information from the FAA's Terminal Area Forecast (published in December 2010).
- Comments received from the PAC previously were addressed
- Additional research was done related to the Airport Reference Code (ARC). The project team looked up what kind of airplanes there were that were previously reported as unknown.

Sara reviewed the past and current numbers of aircraft based at Aurora, including the new projections for 2030 (based upon a 1.58% annual average growth rate).

Year	Aircraft Type	Revised Forecast	Previous Forecast
2010 Historical	Single Engine	261	312
	Jets	23	21
	Multi-engine	40	59
	Helicopter	25	35
	Other	5	5
	Total	*354*	*432*
2030 Projection	*Total*	*464*	*566*
	Jets	47	51

Operations: Sara explained the takeoffs and landings changed with the based number of aircraft. This number is now estimated at 90,909 for 2010. The number was previously somewhere around 100,000. Based upon the estimated annual growth rate, the revised forecast for 2030 operations is 124,386 as compared to the previous figure of 131,312.

Sara asked the PAC if there were any questions about the traffic or forecast analysis before moving on to Chapter 5. There were no questions from the PAC.

Draft Chapter 5

Sara said that the runway length surveys have been updated to reflect at least 500 constrained annual operations, which justifies a longer runway based on the FAA criteria. Besides the additional completed surveys sent to the PAC prior to the meeting, additional surveys have been received.

Tony Holt asked about the updated survey and requested to talk about it further later.

Bruce Bennett noted that Management West is still at Aurora, although the constrained jet aircraft owned by Management West is not.

Sara explained that three build alternatives have been proposed in order to meet the facility requirements.

Sarah Lucas explained that the preferred alternative would be developed based upon the elements included in the three build alternatives and the no-build alternative and the preferred alternative would be the basis for the ALP. She explained that the various elements outlined in the comment form could be mixed and matched to develop the preferred alternative.
Sarah explained the various comparative elements within the alternatives:

- Airport Reference Code (ARC)
- Runway length and strength
- Instrument approach capability
- Hangar/tiedown locations
- Cargo apron location
- Fuel tank location
- Air traffic control tower (ATCT)
- Aurora Rural Fire Protection District Facility

Approximately 40 developable acres are needed to meet the forecasted demand for the activity at Aurora. Currently ODA has about 9 acres of developable land. Development necessary for precision approach path indicators, a cargo apron, helicopter parking, vehicle parking and some additional hangars would be built on state-owned property. In all of the build alternatives, the adjacent church camp property (16 acres) is shown to be suitable for hangars and related development.

- *No-build Alternative:* The no-build alternative is ARC B-II. An air traffic control tower (ATCT) will still be constructed in this option, but a location has not yet been identified. The runway length would remain at its current length of (5,004 feet). Instrument approach capability does not change. The approach criteria minimums remain not lower than 1 statute mile. (The Runway Protection Zone (RPZ) at the end of each runway correlates to the approach minima). The pavement strength would remain the same (45,000 pounds dual-wheel gear).
  While the no-build alternative is essentially a do nothing option, it does not mean that there would be no financial impact to the airport. Most prominently, there would still be a cost associated with maintaining the current pavement and facilities.

- *Build Alternative 1:* – Alternative 1 is also ARC B-II and includes a 600 foot runway extension. The southern RPZ would extend south of Keil Road and an aviation easement would be sought. The northern RPZ would encroach into Columbia helicopters. The majority of state-owned property would be developed as hangars in this option. The state has identified three various alternatives for the location of the air traffic control tower. This alternative includes a fire station facility near the control tower. The air traffic control tower would be located midfield on the east side. Two helipads would also be built on public property. No cargo apron is included in this build alternative. Instrument approach capability does not change although the visual glide slope indicators would be upgraded to precision approach path indicators. The pavement would be strengthened to 60,000 pounds (dual-wheel gear). The fuelling tank would be relocated to the south of Aurora Aviation.

- *Build Alternative 2* – Alternative 2 increases design standards to ARC C-II. The approach minima are greater and extend RPZs further off of airport property; requiring additional easements or land acquisition. There are further impacts to Columbia Helicopters. This alternative has a fairly equal split between development of tiedown facilities and cargo aprons. The helicopter parking pads are same as in build alternative 1. The fuel facility is located near the cargo apron, northeast of Aurora Aviation. The fire station would be located near the current water suppression system, and the air traffic control tower is located near the center of the airport. The pavement would be strengthened to 60,000 pounds (dual-wheel gear). The runway and parallel taxiway would be extended to the south by 1,000 feet, which would require the closure of Keil Road (total runway length of 6,004 feet).

- *Build Alternative 3* – Alternative 3 also increases design standards to ARC C-II and shows a precision approach. The precision approach was something a lot of pilots requested during the goals and issues identification phase. There is no runway extension included in this alternative and RPZs increase significantly. The high voltage power lines would have to be relocated or put underground. The pavement strength remains the same. The helicopter operations areas are located north of the current cargo apron. The air traffic control tower is located closer to the north end and farther from the runway than in the other two build alternatives. The Fire District's building is located east of the fire suppression system. The fuel tanks would be located at the south end of state-owned property and the cargo aprons would be centrally located on state-owned property.

Steve Hurst asked if the no build option would include an air traffic control tower. Sarah clarified that the control tower is a committed project and would be built regardless, since it's already funded.

Noise: Casey Storey explained the type of noise model used and that it looked at saturated noise vs. point in time noise. He said the model accounts for more disturbances by night time noise vs. daytime noise. Casey went on to explain that they looked at the flight paths from this year and the aircraft type and mapped where those types of aircraft will fly. The flight tracks reflect the current noise abatement flight patterns and departure procedures. Casey noted that based upon the FAA criteria, residential land use is not considered compatible within the 65 dBA (average decibel) contour. Casey reviewed the noise projections for each of the proposed alternatives:

- All 2020 alternatives have the same type of and quantity of aircraft and show an increase in noise over time.
- Build Alternative 1 shows a slight bulge/increase in noise to the north due to the expanded runway.
- Build Alternative 2 contours shift south, due to the proposed southern extension to Runway 35.
- Build Alternative 3 contours remain the same as the 2020 No Build Alternative contours, since the runway configuration would not change.

Steve Hurst asked about the maps for the noise and confirmed whether or not alternative 2 was supposed show 2010 or 2020. Casey confirmed that it should have reflected 2020 and that this was a typo.

Tony Holt asked if this assumes the traffic control tower is built. Casey replied that it did not.

Mitch Swecker added that an instrument departure would be recommended for departures as well as certain flight patterns designed to keep the aircraft away from the Charbonneau area.

Tony said that he just wanted to understand what is currently in place.

Sarah explained that there are currently noise abatement procedures in place at the airport. Instrument procedures for northward departures are expected to be approved by the FAA in the fall. These procedures are in line with the current recommended noise abatement procedures for northward departures.

Tony said that he was aware of that but many operators don't pay attention to the noise abatement procedures and he asked if other flight paths were factored into the model. Casey responded that yes, they were taken into account.

Nick Kaiser said that the decibels don't change much between the alternatives and he asked if there were things that affected that. Casey explained that there is some shift based on the type of aircraft since there will be more jets in the future.

A member of the public asked what is happening to noise abatement around Aurora. Mitch replied that they've tried to change the flight pattern to avoid flights over Aurora and planes should depart to the south around Aurora.

Bruce Bennett said that he was involved with the FAA during the time they designed the airport departures/flight pattern and that they were designed to avoid Aurora.

Rainse explained that the preferred alternative would be presented to the Oregon Aviation Board later this month and then again in April for their concurrence. Chris said that he will send information out to the public about the meetings with the State.

Nick asked about the comment period for the draft alternatives. Chris said that there will be a two week comment period prior to the presentation to the Oregon Aviation Board.

Public Workshop

Vaughn reviewed the format for the public workshop and explained there would be 45 minutes for the public and the PAC to interact with staff to ask questions and review information about the draft alternatives. He recommended that participants take a comment form in order to review information and formulate their questions and comments. Vaughn suggested that participants think about the issues that need to be identified or considered when developing the preferred alternative. He said that the group will come back together after the workshop and the feedback heard will be discussed with the PAC for 30 minutes, then there will be time for public comment. If necessary, the public comment time would be extended and each person will be given a couple of minutes to provide testimony.

After the 45 minute public workshop, Vaughn reconvened the PAC session. He said he hoped that everyone had an opportunity to ask questions and obtain information from staff and PAC members. Vaughn explained that the PAC would now have the opportunity to discuss the draft alternatives and give input on the direction for the preferred alternative.

To start off the discussion on the preferred alternatives Sylvia Ciborowski and Adrienne DeDona reported out on the group discussion during the work session related to noise impacts and the draft alternatives. The following is a summary of the comments collected on flip charts at each of the information stations:

- If the runway object free area (ROFA) extends, what will happen to the highway?
- Have you considered what this project will do to the town of Aurora? Who needs this extension?
- I'm concerned about the impact of the RPZ on off-airport properties (alternatives 2 and 3)
- There needs to be consideration for the economic feasibility. There is no way this will pencil out economically. It will result in greater revenue from gas sales, but this will never cover the huge expenditure.
- I'm concerned about the impacts/development on the best farmland in the world. This farmland is more important for the future of food production than to pave over it.
- Currently the flight plan/pattern is not followed, especially at night. Planes fly right over houses and shake the windows. Concerned about the future safety and who disciplines pilots who fly in no flight zones.
- I'm concerned about the feasibility of Alternative 3.
- Can we use the additional capacity at Salem Airport rather than expand Aurora?
- The Run-up area is too close to hangars and private property (condo association) in Alternative 2. I'm concerned about the safety of this situation and the dust flying up in the area.
- What does it take to become a C-II Airport?
- I'm concerned about what will happen to the property values of nearby homes with the noise increase.
- I'm an airport user with five planes stationed in two hangars at Aurora. I prefer Alternative 1 with the 600 foot extension and ARC C-II.
- Can alternative 1 become a C-II with all other elements remaining the same?
- I have a concern about fumes from jets on people. The wind blows fumes into residential areas.
- The no-build option is no good because it does not have a fire facility. If we have a tower, we need a fire facility.
- Since we are already a volunteer fire station in Aurora, who will pay for a new fire facility?
- Can you request a modification to standards of the ROFA (on Highway 551) from the FAA?
- Why do you need more clearance for a more precise approach?
- Has ODOT gotten onboard with road improvements, especially Keil Road?
- Use displaced thresholds as a last resort. Sarah L. explained that a displaced threshold could be done to gain runway length for takeoff. The runway could be extended, but a displaced threshold, where aircraft land, would not be placed at the end of the extended runway pavement. The runway pavement behind the threshold could be used for takeoff, but not for landing. . .
- The Tower will enforce flight patterns (to reduce noise impacts to area neighborhoods) by keeping in contact with pilots by radio.
- Three to four days a week there are early morning airplane departures at approximately 3 a.m.

- Planes should not be allowed to take off before 7 a.m.
- If the current noise/flight pattern policy isn't being followed, why would a different policy be followed?
- Where is the money/funding for the project coming from? The Runway is already long enough. Enough money has already been spent on Aurora. Aurora doesn't have a lot of constraints as compared to the Orange County Airport (CA).
- The power lines at the north end of the airport should be removed or undergrounded for community safety reasons. The expense of doing so should be shared.
- An Educational Center for children should be built at the airport as well as a mechanic school in partnership with the local community colleges. A nearby playground is also a good idea so that kids could watch the airplanes take off and land.
- The area west of highway 551 will be severely impacted if the runway is extended. Farm equipment will be forced into the busy highway, creating safety concerns. Deer Creek Mobile Home Park will have limited access due to the closure Keil Road. Highway 551 will be the only point of access.
- Helicopters fly too low and are too noisy.
- The runway extension will increase the noise impacts to Deer Creek Estates. Residents already smell jet fuel. Airplanes take off as early as 4 a.m.
- Will there be any consideration for jet fumes in any of the future alternatives?
- The impervious surfaces drain to area farmlands since adequate drainage systems do not exist.
- Who enforces the noise abatement procedures? Orange County has a good noise abatement system.
- Will future zoning be amended due to the expanded noise footprint?
- The statement in the report that indicates that NW and Charbonneau residents will not be affected (related to Environmental Justice analysis) is inaccurate. There are 141 homes in the Deer Creek neighborhood. There will be quality of life impacts to residents.
- What will be done to mitigate noise from maintenance on jet engines?
- There seems to be a high number of planes flying over the Charbonneau area when there shouldn't be (based upon recommended flight patterns/noise abatement procedures).
- Mitigation efforts done simultaneously with airport improvements will help make things better for area residents.

PAC Discussion on Alternatives:

After the report out of public comments during the work session, the PAC reconvened for further discussion on the draft alternatives. The following is a summary of their comments and recommendations for consideration when developing the preferred alternative:

- Fred Netter said that his number one concern has consistently been regarding safety. He indicated that the no-build includes the tower, but not a fire station. He said that it would be his preference to have a Fire Station facility at the Airport near Airport Road and the water suppression system. He also indicated that closing Keil Road would a safety concern due to

emergency access and farming equipment access. Fred also requested that Airport Road be improved and called for Clackamas County to assist with funding for roadway improvements.

- Charlotte Lehan said that the traffic analysis doesn't recognize Clackamas County's role in surface transportation. She explained that Clackamas County's concerns are related to the surface transportation impacts and the impacts to area agriculture (industrial development pushes agriculture out). Charlotte added that Clackamas County has been excluded from some of the planning steps in this process.
- Dave Waggoner agreed that Clackamas County should be involved in funding the airport due to the positive impact the airport has on area economic development.
- Charlotte commented that the funding for the project hasn't been addressed.
- Steve Hurst asked if increased use of GPS and other technologies could be incorporated in lieu of a need for a runway extension.
- Bruce said that in order to make take off quieter, planes/pilots must use less power. To use less power, more runway is needed. This is a typical procedure for noise abatement elsewhere.
- Tony Holt said that the Aurora Airport is constrained by three major roads and only one runway. He indicated his support for the no-build alternative.
- Bruce agreed that the airport is constrained and should 'fill-in' for development. He added that agriculture and golf courses make good neighbors to airports and that no other building development should be allowed near airports.
- Charlotte requested that the financial impact to the public should be captured somehow and that Airport Road should be part of the financial analysis.
- Nick Kaiser stated that Airport Road gets 2,600 trips a day, but is listed as a collector street. It should be listed as an arterial street and should be designed as such. He added that in Alternative 2, the RPZ goes over the Deer Creek neighborhood and highway 551; this is a safety concern.
- Fred added that development in various communities impacts the airport too.
- Steve said that the Wilsonville City Council will discuss the Airport Alternatives at an upcoming meeting and will determine a formal position within the two week comment period.
- Ted Millar said that Aurora Airport is a category 2 airport and is an important part of the National Aviation System. He added that the Airport benefits Clackamas and Washington Counties (the cities of Wilsonville and Aurora). Ted commented that from a safety and an economic development standpoint, the runway should be expanded. There is an economic opportunity and that need should be filled. He called for an additional 1,000 feet of runway and increasing the pavement thickness of the runway.
- Rick Kosta stated that National retailers can land elsewhere in Oregon (Hillsboro, Portland, and Troutdale). He went on to say that the only alternative that doesn't impact Deer Creek neighborhood is the No-build. The noise impacts to Deer Creek residents in any of the build alternatives will be over 65 dB. What mitigation can be done for Deer Creek residents?
- Mitch Swecker said that before any mitigation were to occur, actual measuring of noise exposure would likely be conducted. If impacts are shown, they may be mitigated.

- Dave said that the current situation at the airport is dangerous for run-ups and that the run-up area in alternative 2 is impractical. It's too close to hangars and one of the hangars provides space for the Emergency Operations Center. There is no run-up space allocated in alternative 3. He called for alternative 2 to be modified to allow for a run-up area that doesn't crowd the hangars.
- Bruce said a greater than ¾ statute mile (sm) approach should be required; it's safer, quieter and saves fuel. He requested the minimums be lowered with a small extension to the south.
- Tony Holt asked how many of the user surveys were based at Aurora. He added that there should be a better, more rigorous way to collect/validate this type of data.
- Dan Riches said that Columbia Helicopters has reserved land for future development, so they cannot support any type of expansion to the north. He added that Columbia Helicopters supports safety improvements and improvements to Airport Road. Dan preferred the no-build or a hybrid of the no-build alternative.
- Nick said that the 2002 noise contour showed different planes, but there is not a huge difference. There has been a larger increase in the number of aircraft.
- Fred noted that expansion of the airport may impact other businesses' future plans and suggested that monetary compensation be offered to those businesses. Dan replied stating that Columbia Helicopters monetary compensation wouldn't work in their case because they are looking for a more long-term investment.

To wrap-up the discussion on the draft alternatives and to provide direction to the project team on the development of a preferred alternative, Vaughn directed the PAC to provide their individual recommendations/feedback on the draft alternatives in a round-robin fashion. The following summarizes their feedback:

- Dave Waggoner echoed his concerns about the run-up areas.
- Nick Kaiser said that there are a lot of variables within the four alternatives, especially with regard to noise.
- Dan Riches called for the no-build option or for an extension to the south.
- Steve Hurst said that he is looking forward to hearing the public comments.
- Fred Netter commented that safety is important and a Fire Station should be part of the plan.
- Ted Millar said that the Runway should be extended in addition to the thicker pavement surface. He suggested considering a possible hybrid alternative with a displaced threshold.
- Tony Holt said the no-build is the best option and that there are other airports in the area to operators to use. He feels the expansion of Aurora is not justified.
- Bruce Bennett said lengthening and strengthening the runway are important and that the overall safety of the airport should be increased. He added that the overall noise and environmental impacts should be decreased.
- Charlotte Lehan said that Clackamas County has not yet weighed in on the project and, at this time, she supports the Fire Station and the Airport Control Tower for safety reasons.
- Rick Kosta said he supports the no-build option since there are other airports in the area.

- James Meirow said that he would like to hear from the neighbors to the south of the airport.
- Craig Wilmes said he supports the run-up areas and displaced threshold.

Overall the PAC did not come to consensus on a preference for one single preferred alternative. However, there seemed to be somewhat shared support for safety improvements such as the Fire District's facility and the Air Traffic Control Tower. The consultant team and ODA will evaluate all comments and concerns received and consider them when developing the preferred alternative.

Public Comments:

Members of the public were each given two minutes to provide oral testimony regarding the draft alternatives. Several members provided written testimony in addition to or in lieu of oral testimony. Those statements are attached to this summary as separate documents.

- John Ranken, 26715 Baker Rd: He is an Attorney and consultant representing several property owners to the south. This area comprises 75 acres of properties in the EFU zone—from Airport Road to Hwy 551. Mr. Ranken was formerly the city attorney for the City of Aurora for 13 years and has been asked to help these property owners. The thanked PAC for its manner, and the public, and Chris C. for his efforts to help him get oriented to the project. He distributed information to the PAC showing the properties to the south that would be impacted. He said that at this point, their position is that they are interested in build alternative #1 since it seems to give everyone a little something. He added that this seemed to present a compromise.
- Mike Rite, NW Aircraft: Has been involved in aviation his whole life. He said he has been very involved in airport issues. Mr. Rite added that there have not been meetings in Mulino or McMinnville about expansion because no one wants to go there. He said that people are coming to Aurora because they want to be there. He said there is not as much going to Portland. Mr. Rite added that some complaints about noise will be addressed and that tower will help airplanes not go over neighborhoods as much. He indicated he supports extending the runway because it provides additional safety and will bring in other aircraft that aren't coming in currently.
- Larry EIschen, resident of Charbonneau: Mr. Elschen said he was representing Charbonneau neighbors. He presented a petition with 260 Charbonneau names on it, and indicated it should include more signatures. Mr. Elschen read from the petition (attached).
- Ken Ivey, representing a planning organization in Clackamas County. Mr. Ivey said he has heard a lot about safety and that airplanes are coming into a marginal airport, and they are choosing to create an unsafe condition. Mr. Ivey stated that these pilots have at least four alternatives within 30-40 miles that do have the infrastructure to safely handle those planes. He stated the group he represents would vote for the no-build alternative. He stated if you want to make the airport safer, direct those planes to those airports that have the infrastructure on the ground paid for, rather than asking us to shell out more money. I live near the airport, and I don't see a noisier airport and having to pay for the highway to get there.

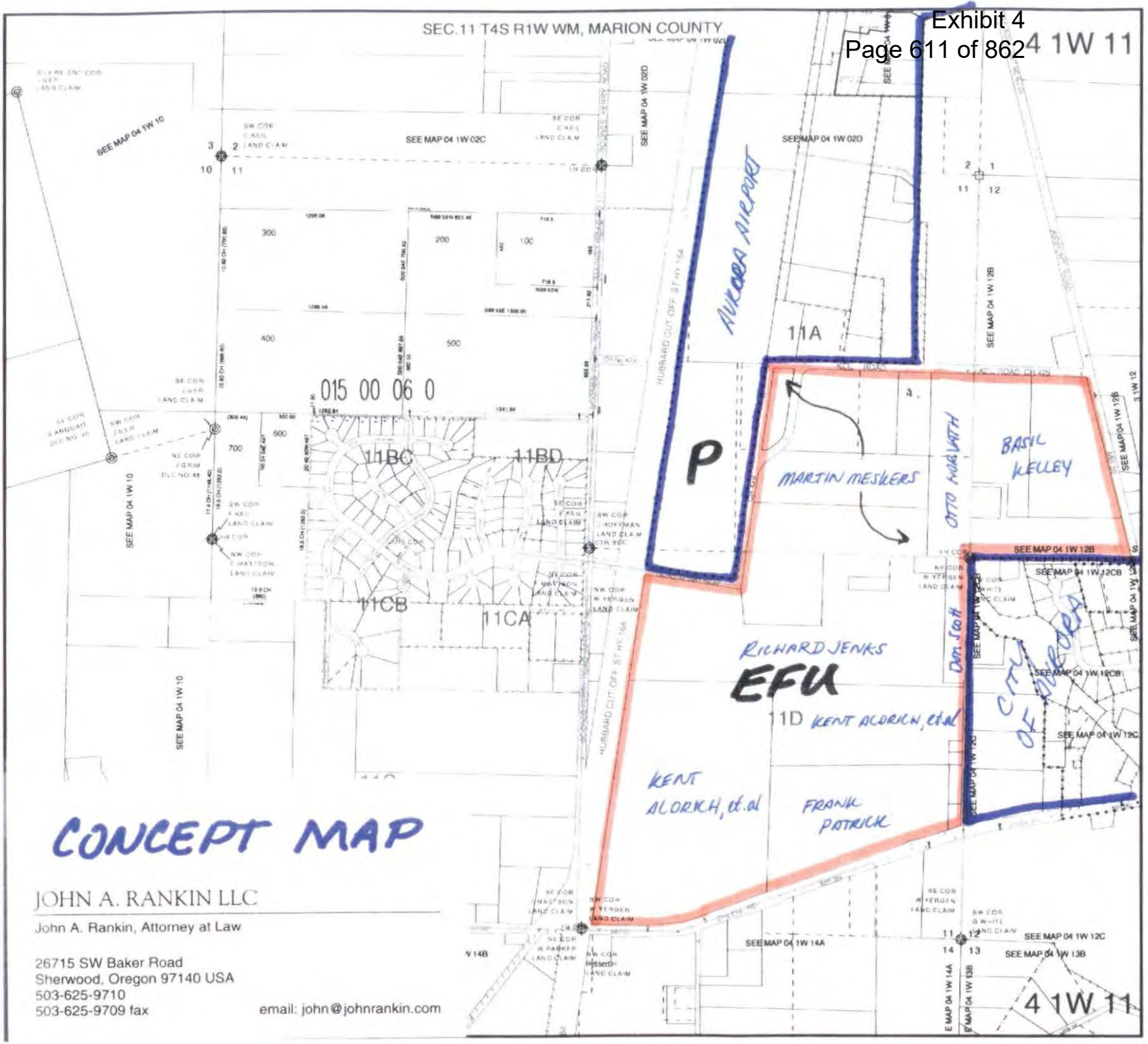
- Ailin Ottinger: Mr. Ottinger said the main thing we are doing is making it possible for more commercial flights outside of Aurora. As a taxpayer, I wonder do the corporations have any part in funding all of this?
- Ben Williams, resident of Aurora and President of Friends of French Prairie: (submitted attached written comments). He said he was concerned about preservation of farmland and the impact on surface transportation. He said, we support addressing the safety requirements, but we have a 20-30 year history of the domino effect. With improvements, it will only get bigger and we'll need more improvements. The airport is surrounded by EFU farmland that needs to be preserved.
- Jack Kaley: He said he has a commercial pilot license and has been flying at Aurora 30 years. He is also the director of Positive Aurora Aviation Management Group. He attended the first PAC meeting, and noted that most placed aviation safety as their top concern. He said that is my top concern, especially safety issue for helicopter landing areas. He went on to say that Aurora has stated safety provisions for helicopters. We need to properly separate helicopter and fixed wing areas. Helicopters take off from tie down areas that are designated for fixed wing areas. There are no designated helicopter landing and parking areas on state owned property. Because of ground turbulence, it is essential that helicopters be separated from fixed wing tie down locations. Mr. Kaley distributed some diagrams explaining the problem. He said the FAA has established safety circles and helicopter standards. The safety circles have a range. In his drawing, he superimposed a helicopter pad between a fixed wing. The projected increase of helicopter traffic means we need safe operations. In the interest of overall safety, we must provide for proper separation. The master plan should plan for safe helicopter operation. The vacant state owned land east of the helicopter blade renovation building should be used for locating several helicopter pads.
- Manuel Martinez: chief pilot for JHRD investments: He said that his company moved from PDX to Aurora State due to his recommendations. His company has provided $2 million in local revenue. He has safety concerns in operating in and out of Aurora Airport. He felt a tower would enhance the safety margins, and runway length is a concern. In his 15 years as pilot, he has had 8 close encounters, mostly near Aurora Airport.
- Larry Brons: professional pilot, flying primarily out of Aurora, doing professional contract flying: He said he supports the Air Traffic Control Tower for safety. The additional 600 feet of runway would make operations safer and more economically viable. He said we are coming out of recession and we should try to stimulate the economy in the local area by making the airport more viable for business.
- Bryan Mobey, representative for Deer Creek Estates: He said they have concerns about their quality of life. He stated now with noise and the smell of fumes from jets, it affects us drastically. They cannot sit on their patios without being disturbed by aircraft. He supports the Air Traffic Control Tower to keep planes out of no fly zones and the Fire Response Facility. He felt an expansion at the airport will negatively affect their property values due to noise and jet fumes. He added that planes take off at 4 or 5 in the morning and that nobody has control of the

planes. Salem tells us to get the number of the aircraft, but we can't get their numbers at night. He said he is concerned about an accident in the future.

- Annie Kirk, Aurora resident: She said she is representing her family. She said regarding undue hardships and compensation, I have not heard anything about outside of the fence compensation for Aurora and Charbonneau residents. For impacts to Airport Road, who will bear the burden for those improvements? The road is grossly unimproved now. It needs to be taken care of, but we have more to come. I am comfortable with the tower and the fire services for safety. But I'm not convinced that any of the alternatives resolve the interest of the communities outside of the fence.
- Lolita Carl, full time farmer in Marion County: She said she is on Marion County Board of Directors for the Farm Bureau. Ms. Carl said that farming is the number one industry in Marion County. She said she is worried about encroachment on farmland and economic development. Agriculture is the second industry in Oregon, and all of us eat. All of the land surrounding Aurora Airport is the most fertile in the world. Once we start a little bit of development, it just encourages more. As a tax payer, she wonders where the money is coming from to support so few.
- Ron Sterba: He shared his concern with the power lines on north end of airport and asked what happens if a plane hits them? Where does the power grid go to? Hospitals or schools? They should be relocated. He said he would like to see an education center on the airport to share with high schools and local community colleges. Would like to see a realignment of runway so the approach is over I-5 on the north and to take the approach corridor off of Charbonneau and move the runway 75 feet to west to allow for an expansion of the taxi way without removing any buildings.

Meeting Adjournment

Rainse wrapped up the meeting and reviewed the next steps for the project. The next meeting will cover the Airport Layout Plan and the Capital Improvement Plan. This meeting is tentatively scheduled for the end of June. Rainse reminded everyone that there will be a public review and comment period for the preferred alternative and that an e-mail notification will be distributed with this information. The meeting was adjourned at approximately 8:30 p.m.



LEGEND

LINE TYPES

TAX LOT BOUNDARY — OLD PROPERTY LINE

ROAD RIGHT-OF-WAY — VACATED RIGHT-OF-WAY

RAILROAD — RAILROAD RIGHT-OF-WAY

STREAM, LAKE, ETC. TAX LOT BOUNDARY — STREAM, LAKE, ETC. NON-BOUNDARY

SUBDIVISION BOUNDARY — PARTITION PLAT BDY

TAX CODE BOUNDARY — EASEMENT

SYMBOL TYPES

D.L.C.

CONTROL POINTS

SURVEY MONUMENTS

G.L.O. CORNERS

SECTION — 1/4 SEC — 1/16 SEC

1/4 COR — 1/16 COR

NUMBERS

TAX CODE NO.

000 00 00 0

ACREAGE – ALL ACREAGES EXCLUDE ANY PORTION THAT MAY LIE WITHIN THE INDICATED PUBLIC RIGHT OF WAYS.

TICK MARKS – WHEN A TICK MARK IS INDICATED ON THE EXTENSION OF A LINE, THEN THE DIMENSION GOES TO THE TICK MARK. GENERALLY THIS IS USED WHEN DIMENSIONS GO INTO PUBLIC RIGHT OF WAYS.

200.00
150.00

ARROWS ARE USED WITH DIMENSIONS IN AREAS OF GREATER COMPLEXITY.

NOTICE: This map was created for Assessor's Office use ONLY.

Assessor "We Care" GIS Geographic Information System

SCALE 1" = 400'
or 1:4800

Plot file created: August 21, 2001

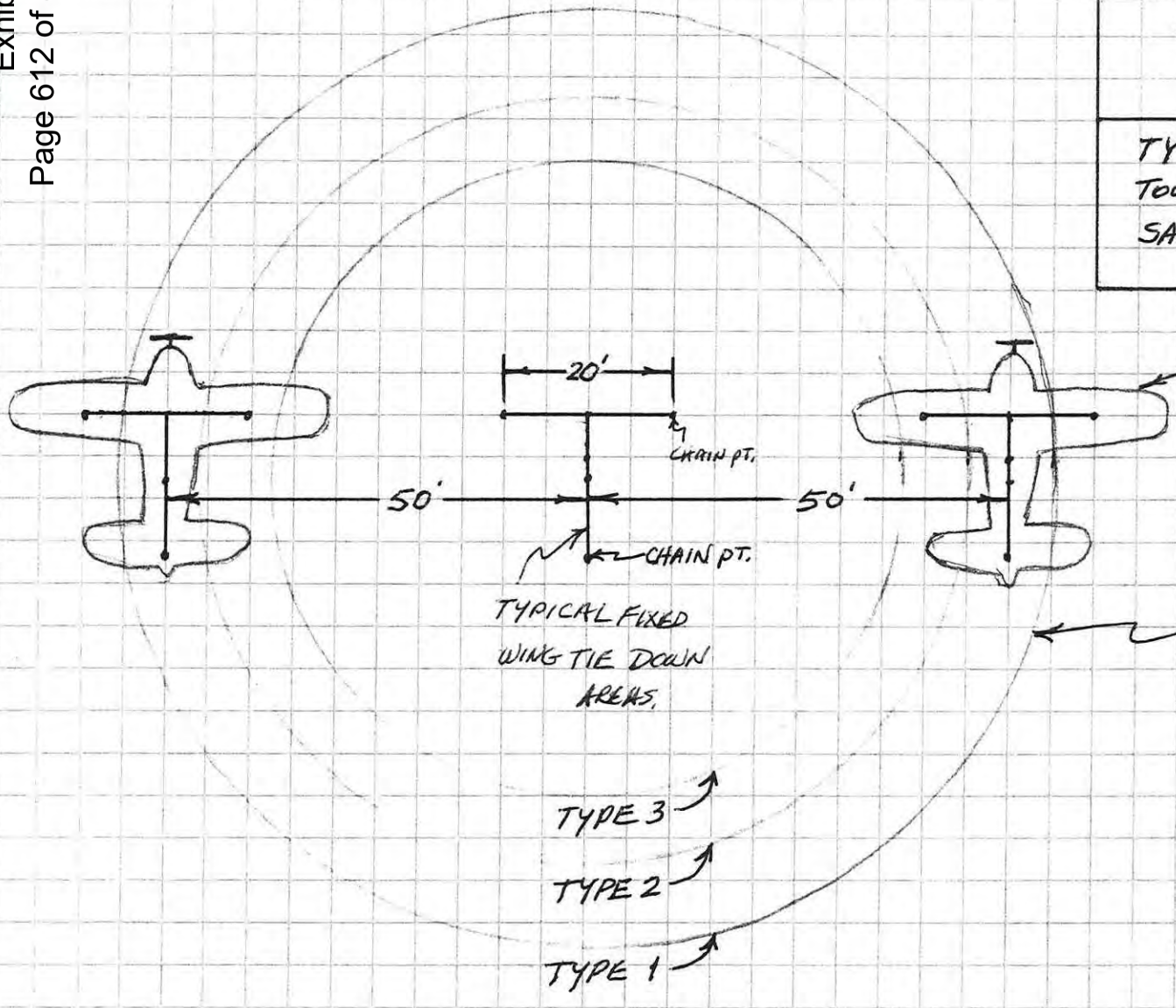
JOHN A. RANKIN LLC
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email: john@johnrankin.com

Exhibit 4
Page 612 of 862

AURORA STATE AIRPORT

STATE OWNED PARKING AREA FOR FIXED WING AIRCRAFT

SAFETY CIRCLES FOR HELIPADS FAA HELICOPTER STDS.			
TYPE	1	2	3
TOUCH DOWN PAD	30'x30'	20'x20'	15'x15'
SAFETY CIRCLE	110'	90'	75'



TYPICAL SINGLE ENGINE FIXED WING AIRCRAFT. (C-182, BONANZA, SUPERCUB)

HELIPAD "SAFETY CIRCLE" SHOWN TO DEMONSTRATE SAFETY PROBLEM OF HELICOPTERS LANDING IN FIXED WING PARKING AREAS.

JEK 2-6-11

SCALE - 1"=20'

Aurora State Airport Master Plan Update – Planning Advisory Committee (PAC) Meeting #4 & Open House

March 10, 2011

North Marion Intermediate School

5:00 – 7:30 pm

SIGN IN SHEET

NAME	REPRESENTING	MAILING ADDRESS	PHONE#	E-MAIL
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Dick Spence	—	8470 A S.W. Country Dr, Wilsonville 97070	503-694-5875	DICKSPENCE72@gmail.com
CINDI ELLIOTT	-	23023 YEARN LANE NE AURORA OR 97002	503 678-2703	DEERCREEKNURSERY@AOL.COM
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Reginald L. Kodding		31988 SW Country View Lane Wilsonville 97070	503-694-2245	RLKAVR.SOC@centurytel.net
William Wolfkiel	Marion	8573 yergen Rd NE AURORA 97002	503 678 5167	
Richard Kosta	Deer creek	22073 Floral Hill NE 97002	503 678 3863	Rick@theKeyE.Holyoak.com
MIKE IVERSON	Aurora Farms	13490 Edwards Rd NE Aurora 97002	503-849-0662	Mikeiverson@Centurytel.Net
STANLEY ANDERSON	SELF	21999 Lincoln Rd NE Aurora 97002	503 678 2209	
BEN WILLIAMS	Friends of French Prairie	23049 Ebony Ln NE Aurora 97002	503 585-5870	benwilliams@liturgica.com
BRIAN MABEY	DEER CREEK ESTATES	22693 Lone Ave Aurora 97002	503-6782893	
Carol Dobbs	Self - Deer Creek Est	13711 NE Wistana Dr Aurora OR	503 348-2917	ddobbs@centurytel.net
Rob Graham	Aurora Planning Commission	21454 Liberty St Aurora		rabbitlee@yahoo.com
Jason Rankin	Dick Jenks & Neighboring Prop. Owners	24715 SW BAKER ROAD SHERWOOD OR 97140	503 625-9310	jshill@jebrankin.com
Brandon Reich	Marion County	5155 Silverton Rd NE Salem 97305	503-588-5212	breich@co.marion.or.us
Christine Haren	myself	15777 NE Beckett Rd Aurora OR		
BERNICE JUEL		25180 NE PRAIRIE VIEW DR AURORA OR 97002	503-678-3383	
Mandy Mantinger	JHRB INVESTMENTS, LLC	17717 NE 20th ST Vancouver Wa 98684	503 457-4891	
Nitta Brown		21883 Airport Rd. NE Aurora OR 97002	503-678-6880	nittabr@yahoo.com
(Master of Ceremonies)				

Aurora State Airport Master Plan Update – Planning Advisory Committee (PAC) Meeting #4 & Open House
March 10, 2011
North Marion Intermediate School
5:00 – 7:30 pm

SIGN IN SHEET

NAME	REPRESENTING	MAILING ADDRESS	PHONE#	E-MAIL
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Susie Stevens	Chedunnegan			susie@tekport.com
RONALD STERBA	PILOT	500 20th ST NE Salem OR 97301	503-559-3191	SPINTESTERBA@MSN.COM
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Lorraine Gonzales	Clackamas Co		503 742-4541	lorraineg@co.clackamas.OR.US
BOB ALTEMUS	PUBLIC	2740 Summit Pl WEST LINN	(503) 703-1482	BANDLALTEMUS@COMCAST.NET
Lisa Veber	public	22475 Bents Rd NE Aurora	503-680-4316	lisaveber@aol.com
Linford Hughes	Public	[illegible]		[illegible]

Aurora State Airport Master Plan Update – Planning Advisory Committee (PAC) Meeting #4 & Open House
March 10, 2011
North Marion Intermediate School
5:00 – 7:30 pm

SIGN IN SHEET

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Keith Drumheller		32545 SW Juliette Dr Wilsonville OR	(503) 694 1065	
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Bruce Bennett	Aurora Aviation	P.O. Box 127	503-678-1217	Bruce@AuroraAviation.com
Gary Fish	DLCD	635 Capitol St NE, Salem OR 97301	503-373-0050 x254	gary.fish@state.or.us
LARRY BERGMAN	WYLEE CONDO ASSOC	7816 SE 13TH AVE PORTLAND, OR 97202	503-572-3832	LARRY@BERGMANPHOTOGRAPHY.COM
DAVID WEGGONEER	WILLAMETTE AVIATION			DAVE@WILLAMETTEAV.COM
JAMES CONSTANTINE	COMMISSIONER	2200 FLIGHT AVE NE AURORA		
VIRGINIA CONSTANTINE	COMMISSIONER	" " "		
Alan Kelder	Self	31988 SW Country Club Dr Wilsonville	503 694-2745	alkay450@centurytel.net
RANDALL KAPPE	SELF	23207 FLIGHT AVE NE AURORA	503-678-5551	RANDALLKAPPE@COMCAST.NET
RICHARD GODDARD	WILSONVILLE CITY COUNCIL			richardgoddard2010@gmail.com
Tony Holt		7670 SW Village Green Circle W. 97070		
Suzanne Mulvaney	SELF/NCE	2211 13TH AVE Forest Grove, OR 97202		SUZY@NANATURE.COM
PAT MULLIGAN	SELF/ODA	P.O. Box 819 Canby, OR 97013	503-702-4931	KCMULL@COMCAST.NET
Phillip Russell	Self	PO Box 2533, Wilsonville OR 97070	503-780 4916	PHIL@PJRCONSTRUCTION.COM
MJ Cartaseqna	Clackamas County / C	2051 Kaen Rd, OR 97045	503-742-5942	mcartaseqna@clackamas.us
[illegible]	Chair Emeritus / Wilsonville	9318 Chapman Road NE Aurora	(503) 807-6391	CPAC.#1@Yahoo.Century.com
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Rick Hardman	Self	21124 Liberty St NE Aurora Or 97004	503-539-2413	
[illegible]	[illegible]	[illegible]		
Marilee Sullivan	Aeronautic	Jville Sayer Apt 10 Box 34 Aurora OR 97002		marilees@yahoo.com
Larry Burns	Self	2024 NE 21st Ave Canby OR 97013		LCBURNS@CANBY.COM

Aurora State Airport Master Plan Update – Planning Advisory Committee (PAC) Meeting #4 & Open House
March 10, 2011
North Marion Intermediate School
5:00 – 7:30 pm

SIGN IN SHEET

NAME	REPRESENTING	MAILING ADDRESS	PHONE#	E-MAIL
Jon Sullivan	Teledyne Brown	PO Box 34 Aurora OR 97002	503 678-2460	
LARRY ESCHEN	CHARBONNEAU	5427 SW FR PRAIRIE RD WILSONVILLE, OR	503 694-6321	
Mike Wright	Self/Northwest Aircraft	22455 Willow Lake NE Aurora OR 97002	503 678 6076	
Lolita Carl		PO Box 129 Hubbard OR 97032	(503) 982-5841	
STEVE BIDD	TSA	7000 NE AIRPORT WAY PORTLAND OR 97218	503 385-7814	
P. ANNIE KIPP	AURORA RESIDENT	P.O. BOX 83, AURORA, OR 97002	—	annie@redbirddesign.net
Mary Hinkle	Local Pilot	3964 Townsend St Salem 97301		
Myland Uttinger	Wilsonville	31092 S.W. Country View Ln	(503) 694-2549	
Dayton Burson	Self	22033 Floral Ave Aurora		
Regan Burson	Deer Creek Estates	22033 Floral Ave. Aurora		
Rob Cutler		7260 SW Fountain Lake Dr Wilsonville		208RC@aol.com
JENNIFER SAUNDERS	WILLAMETTE VALLEY EQUINE	23200 HUBBARD CUTOFF RD AURORA 97002	503 678 4225	JSAUNDERSDVM@YAHOO.COM
Ken Ivey	Aurora Butteville Barlow CPO	24780 NE Prairieview Dr Aurora 97002	5033130178	KEN@ijca-cpa.com
Burke, MaryLou	Deer Creek	PO Box 356 Hubbard 97032	(503) 678-2544	jburke@centurytel.net

Aurora State Airport Alternatives Public Meeting
Comment Summary

30 comment forms were submitted at the March 10, 2011 Aurora State Airport meeting. 59 additional comment forms were faxed, mailed or e-mailed in after the meeting. 13 people submitted a comment form via the online survey.

Additionally, several people submitted other comments beyond the comment form at the public meeting and by email after the event. These comments are attached at the end of this summary.

	No Build Alternative	Alternative 1	Alternative 2	Alternative 3
Instrument Approach Capability	64 No change Approach minima to remain at visual and greater than 1 statute mile (sm)	12 No change Approach minima to remain at visual and greater than 1 statute mile (sm)	16 Improved instrument approach capability. Visibility greater than ¾ statute mile (sm)	8 Improved instrument approach capability. Visibility minima lower than ¾ statute mile (sm) (precision approaches). Parallel taxiway relocated 100 feet to the east and multiple buildings removed or altered.
Airport Reference Code	65 No change Remain at ARC B-II	16 No change Remain at ARC B-II	12 Upgrade to ARC C-II	1 Upgrade to ARC C-II
Runway Length	62 No change (total runway length: 5,004')	17 600' extension to north end of runway (total runway length: 5,604')	10 1,000' extension to south end of runway, closure of Keil Rd. (total runway length:	5 No change to length. However, relocation of the parallel taxiway is necessary for
Runway Strength	69 No change - 45,000 pounds DWG	18 Strengthen to 60,000 pounds DWG	9 Strengthen to 60,000 pounds DWG	4 No change - 45,000 pounds DWG
Air Traffic Control Tower (ATCT) Location	*Has not yet been determined.*	31 ATCT located midfield on the east side.	10 ATCT centrally located within State-owned property, but north of the location in Alternative 1.	5 ATCT located closer to the north end and farther from the runway than in the other two build alternatives.

	No Build Alternative	Alternative 1	Alternative 2	Alternative 3
Helicopter Parking Location	60 No change	18 Designation of helicopter operations area in the northwest section of State-owned property.	3 Designation of helicopter operations area, situated where the fuel tanks are currently located.	4 Designation of helicopter operations area, north of the current apron.
Fuel Station Location	64 No change	13 Fuel tank relocation south of Aurora Aviation.	6 Fuel tanks relocated northeast of Aurora Aviation.	9 Future fuel tanks located at the south end of State-owned property.
Aurora Rural Fire Protection District Location	34 No change	23 Fire District's response building located near the air traffic control tower (ATCT).	35 Fire District's response building located adjacent to the water suppression system.	3 The Fire District's response building located east of the fire suppression system.
Cargo Apron Location	66 No change	10 No change	4 Designation of a cargo apron facility, north of Aurora Aviation.	9 The cargo apron centrally located on State-owned property.

Additional comments provided on comment forms:

1) The number of air operations does not justify the lengthening of the runway. I support the no build alternative with the exception of the Aurora Rural Fire District facility. I am an elected board member of the Fire District. Aurora was never intended to be a "big jet" airport. It is too constrained both in length and width.
2) For the no build alternative, determination of the location for the ATCT is a critical addition.
3) Would like C-2, but don't think closing Keil Rd. is a good idea, increases traffic on Airport Rd. Prefer 600' extension to the north.
4) No additional growth.
5) 600' extension to begin with to the North. After a term of 5 years to help replenish funds extend an additional 600' on the South end (save Keil Rd.)
6) Roads are already over capacity!
7) Alternative 2 as depicted places a RWY 17 run-up area on Wiley Condo Association property very close to existing hangars with large operable doors. This property is not for sale and is not likely to be. Consideration should be given to an alternative that includes a 600' extension with run-up area at the North end and a 500' extension at the South end to create a 60000' runway with an upgrade to ARC C-11.

8) Representing property south of airport "P" zone south of Keil Rd. Totally approximately 75 acres.
9) Since you cut the trees down the noise is louder—trees are important to clean the air. I support the tower and fire station. NO expansion. I am very concerned about how the quality of my life will decrease because of the high noise along with the value of my property which will decrease. I live in Dear Creek Estates close to the end of the now runway and in 10 years the noise has increased greatly. Plus planes flying over our home taking a short cut to the airport.
10) The removal of the trees by the west opened up more noise. I support the no build plan, the tower and fire station.
11) I am a home owner in Aurora.
12) Why don't they do something at the airport to actually get pilots of jets to fly the pattern they are supposed to?
13) Property owner
14) Remove power lines on north end. If the power lines were hit by a plane how would the loss of power to our community. Hospitals, schools, fire police. Shared costs to relocate lines underground—Power Company, City, County, and Oregon Aviation Dept. Educational building for high school students interested in aviation, shared by community colleges and education districts; 2-story building. I have additional ideas. Email me please. (Ronald Sterba, saintesterba@msn.com)
15) Comment on Helicopter Parking Location for no build alternative: already done on whose approval?
16) Aurora is one of the most significant pieces of history in Oregon. Who benefits from a larger and busier airport? Could you consider doing something in the line of keeping the integrity of this small historic piece? It doesn't lend itself to this noisy alternative. Take an example from Vermont and keep this historic jewel as the treasure it should be.
17) Any/all proposed changes need to consider/mitigate the problems that will come outside "the fence" area. Such as east-west traffic and turn lanes, drainage issues, sewer and water supplies up to code, noise and vectoring of air traffic. If the above concerns are not met there will be many irate and vindictive neighbors to deal with going forward. Not a good situation! Given present and mean time future economic situation, we are better to not overbuild especially your way for the very few – the number of operations is still highly questionable! Use your new tower to get accurate numbers prior to any further changes. Runway lengthening and Build options 2 and 3 are not warranted.
18) What is tax payer liability for under improvements of Airport Rd? For the entire expansion?
    What are impacts of expansion on adjacent properties? Zoning? Usages?
    What is the number of regular operators that live in Clackamas or Marion County?
    What will be done prior to expansion mobilization to ensure City of Aurora's annexation of Airport?
    What are the wildlife and environmental impacts? When were studies completed?
19) We have hundreds of large geese in the Charbonneau area which could pose a serious threat to aircraft and civilians. I am not concerned about the lives of the geese—only the people. We have more than enough aircraft emanating from this airport now!

20) The noise level now is too high with low flying planes and helicopters who don't seem to care that people would very much appreciate a quiet neighborhood in which to find refuge. It is unfortunate that we in Clackamas County must suffer the consequences of Marion County decisions on this matter. More planes also mean more cars and trucks on our exits and entrances to the I-5 corridor which is awful right now as it is.
21) Some Charbonneau residents are curious when we see the map showing the sound pressure level (yellow line) following the exact southern boundary of Charbonneau. Also at the DOA meeting we heard SPL/Ob numbers for aircraft on this boundry to be 65 or 75 Db. Institutions such as MIT and HUD have said that the Db for flushing a toilet is 75 Db and a business office is 85 Db. I have a hard time believing that the planes going over as we dine on our patios are more quiet than a toilet or a business office.
    We have taken a straw poll of Charbonneau residents, at a recent social function and well over 95% of us are strongly opposed to the airport expansion!
22) No more noisy planes over Charbonneau!
23) It is hard for me to believe that fuel tax would pay for all the proposed changes. As a tax payer I don't want to have any part of paying for the ability to have more corporate jets landing at the Aurora Airport!
24) I have had enough as it is of planes flying over Charbonneau. I came here from Beaverton because of the rural atmosphere and less crowding. Why must it always be ruined?
25) To approve any changes is "letting the camel in the tent!" Good, bad, indifferent—the future cannot be controlled. Surely a tower and instrument approach would improve safety but that is the camel.
26) Rw 17 run-up area on Alternative 2 is not desirable to owners of Wylee property. It would add constant noise and blast to adjacent hangars. Better solution must be found, preferably adjacent to Willamette Aviation facility on runway extension to north.
27) It is my feeling that most Charbonneau residents have little sympathy for the needs and wishes of users of the Aurora Airport, because pilots presently flying in and out of the airport just don't give a shit about avoiding the airspace above Charbonneau. Improved facilities can only mean continued disregard for the neighborhood, on a larger scale.
28) Locate ATCT at mid-field west of the highway to Hubbard. This will require land acquisition but will reduce tower height with no loss of 2 acres of airport land.
    Locate the helicopter parking in the fire suppression system area. This will totally separate helicopter traffic from fixed wing, plus make room for helicopter business and hangars.
    A reasonable return on investment should always be a paramount consideration where major investment is required. I don't feel that has happened when consideration for runway strengthening or extension is being considered. To spend millions of dollars for the possibility of a very small return on investment makes no sense, especially when both the state and federal government is broke. Lets get realistic.
29) A tower and runway extension is not so good in this climate.
30) Who wrote this? Our biggest problem is people who don't have a clue about aviation write questionnaires like this. Get someone involved in aviation to help make airport programs! You are wasting our money.
31) Justify all projects by cost.

32) The noise over our house is BAD enough as it is. I certainly don't want any increase! I wish there were no Aurora Airport at all.
33) Any changes will only benefit a small handful of users of the airport, not the general public.
34) We hope that the airport is not enlarged! There is enough jet noise now over Charbonneau!
35) Larger jets = more noise
36) Runway extension – particularly north will result in heavier noisier aircraft taking off closer (& lower over) populated areas. Noise problem. Environmental problem. Safety problem. Please do not extend runways.
37) Planes are flying over Charbonneau even though they are required not to. Expansion would only increase the noise level in this area. Think of the noise level at our Portland International Airport. We don't need to push in that direction. Thanks.
38) Aircraft coming and going creates a worsening noise problem for those of us who live in Charbonneau. Making the changes sought will only make a bad problem worse!
39) I trust you will not move north. It would be too close to a population of a growing city (Wilsonville and Tualatin).
40) See submitted letter and petition from Friends of French Prairie.
41) We are concerned about the noise level from larger jets. The hundreds of geese that flock to the small lakes in Charbonneau are a hazard to the jet engines. Longer runways bring larger planes. Larger planes bring freight. Freight needs to be hauled away in big trucks. I-5 in the Wilsonville area and beyond is the most deadly in the State. We don't need more truck traffic and congestion.
42) We hate to see an increase in the airport. Already the noise and planes flying low is very unpleasant. Quality of living in a somewhat rural area is suffering from all of this. Homes to the south would really feel this with runway extensions.
43) In as much as the Charbonneau is a heavily populated area at the southern most edge of the city of Wilsonville, every effort should be taken to not degrade the environmental and living conditions of the residents while improving or, at the very least, mitigating the physical risk to person and property. To that end, I recommend the following: 1) any fuel storage should be located as far to the southern end of the airport as possible. That provides, by physical distance, the maximum protection to the populace in the case of explosion. 2) Approach capability should NOT be lowered below the current one statute mile minimum. North-to-south approaches typically pass over Charbonneau. Lowering the approach minimum directly increases the risk to the populace by reducing the vertical distance between the aircraft and the ground in case of an in-flight emergency such as mechanical failure, bird strikes, and/or wind shear. Further, the potential for increased air traffic coupled with lowering the approach minimum directly and dramatically degrades the quality of life around the airport by increasing the noise pollution associated the lower approaches. 3) Strengthening the runway only serves to allow larger, louder aircraft to access the airport. This change will result in further increasing noise pollution and dramatically increases the risk of damage to property and person in the case of an aircraft crash. 4) Helicopter operations should be located as far away from heavily populated areas as possible. This dislocation not only affords increased protection for the populace but also reduces the noise pollution associated with these aircraft types.

44) My husband and I would like our opinion on the Aurora Airport known. I have attached a copy of the survey for the airport. As you can see we have MARKED every box in the "NO Build Alternative" column. We DO NOT want and improvements done to the Aurora Airport. We would like to see the larger jets go to another airport. The noise from the jets is extremely annoying, especially when the come screaming over the house late at night. We have lived here since 1977. We know there will be change. But we DO NOT want the airport any larger or improved from how it is now. The current JETS are loud and at times too low during landing. The size of aircraft is getting too large for this location.
45) Helicopter parking location should be in south end only.
46) From 1/14/11 to present there have been 127 flights at the intersection of Miley Rd and Airport Rd that are totally out of FAA compliance, according to the flight directory rules. This intersection is 1.6 miles from the airport.
    1. Average flight inbound is 337 yards AGL (laser sighted)
    2. All aircraft are flying in an illegal pattern
    3. Noise abatement—some cases rattle windows
    4. Number of aircraft per month is 113 flights
    5. Most critical—who at the State Department did the bird counts for possible bird strikes?
    6. Four witnesses working on counting birds including AGL and direction of flight have been monitoring morning and night
    7. Flocks of over 1,000+ to as few as 25 or 30 generally fly pattern at 020 degrees to 219 degrees. These are the biggest migration pattern for these birds. These birds are directly in the fly pattern of aircraft flying over the intersection of Miley Rd and Airport Rd.
    8. The first engine out bird strike outbound is going to land in the middle of Wilsonville Shopping Center. It is a coincidence that average AGL for aircraft is 337 yards and geese are 215 to 480 yards AGL.

    With these documentations and witnesses to what may happen in the event of a major accident, who exactly are we going to sue? All flight in and out of this airport should use the FAA directory per its rules and you will find it is pretty safe flying conditions.

Comments from Online Survey

1) I have flown into and out of 3S2/ KUAO for 14 years. The demand for greater volume of aircraft is evident, and improved operational conditions would help Aurora, the local economy and the state of Oregon, whilst improving safety.
2) I have no opinion or inadequate information on other choices, what about both extensions? Why only 60,000 pounds; many business jets today push 100,000 pounds.
3) The city believes that the Airport should be allowed to grow, But it also believes that no growth should happen outside the existing boundaries of the airport until the airport is annexed into the City Of Aurora. In talking to adjacent property owners it seems they also agree with the City. Please consider our comments in your decision.
4) Before selecting the preferred alternative, comprehensive traffic and noise impact studies on surrounding communities need to be completed. The work done on these problems to date is cursory and insufficient for the size of the projects contemplated.

Additional Comments Submitted

Bernice -

Here are some of the questions that need to be addressed along with some additonal information that you will need at the meetings that you are going to attend.

1. FLOCKS OF GEESE

Since the meeting on the 12/12/10, my neighbor, Mike Farmer and I, have monitored the geese on the approach pattern from 7:30 am to 5:00 pm. In two days the average elevation was 1100'. The flocks range from 15 to more than 200 geese in the flock. We are going to keep monitoring the geese to prove how unsafe this is for the possibility of aircraft bird stikes.

2. DO THE PILOTS FLYING IN THE AIRSPACE AROUND THE AURORA AIRPORT HAVE TO ABIDE BY REGULATIONS FOR LANDING CONFIGERATIONS AND TAKE OFFS, INCLUDNG ANY ABATEMENTS OR RESTRICTIONS WHILE FLYING IN THESE PATTERNS?

3. ARE THERE ANY RESTICTIONS AROUND THE AURORA AIRPORT THAT CONCERNS SOUND ABATEMENT? WE WOULD LIKE YOU TO CLARIFY WHAT DECIBLE READING WOULD BE TOO HIGH FOR THE HOUSING AREA THAT SURROUNDS THE AURORA AIRPORT. IS THIS GOING TO BE A FAA READING OR ONE THAT YOU ARE GOING TO APPROVE ON YOUR OWN?

4. WHAT ARE THE RULES FOR ELEVATIONS FOR AIRCRAFTS AFTER CROSSING THE WILLAMETTE RIVER ON FINAL APPROACH TO AURORA AIRPORT?

5. DON'T JETS HAVE TO FOLLOW THE SAME RULES AND REGULATIONS, INCLUDING LANDING CONFIGERATIONS, AS PER THE FAA LAWS AND RULES THAT ARE
IN COMPLETE DETAIL IN THE AIRPORT DIRECTORY THAT IS USED BY ALL PILOTS?

6. WILL THERE BY ANY REGULATIONS THAT CONCERNS "CALM WIND DAYS" WITH WINDS 10 MPH OR LESS? ALL AIR TRAFFIC, IN BOUND AND OUT BOUND, SHOULD BE TAKING OFF FROM THE SOUTH ONLY. THIS WOULD EASE SOME OF THE TENSION FOR THE THOUSANDS OF PEOPLE INVOLVED TO THE NORTH.

All the questions above clearly indicate that no one is monitoring those pilots that are violating the FAA laws. When these laws are broken, will the pilots be fined or lose their license or will a new directory be written by the Aurora Airport to fit their needs?

As of 12/12/10, we have been monitoring incoming and out going aircraft, expecially their elevations (AGL). Just as a note, on 12/15/2010, Aurora Airport manager (FBO)
was notified that at 11:16 am, 11:21 am, 11:37 am and 11:46 am, the highest elevation for a DC3 was 301 yds and as low as 257 yds above Prairie View Estates. After the call, the DC3 stopped making its practice runs.

HARLAN REETZ

I do not believe citizens or local property owners benefit from the airport improvements that are going to be adopted by this master plan. I also don't believe it makes any difference if citizen's comment with disapproval, Marion County and the ODA will give the airport whatever they decide it needs or wants.

I've watched a film of a town hall meeting, concerning the master plan, from 10 years ago. Local citizens were very disapproving of all the improvements being offered. It made no difference. Marion County commissioners have allowed unrestrained growth. Now, 10 years later, the airport claims they need a tower because of safety issues, that were brought on by that unrestrained growth. In today's financial crisis, I am appalled that our federal and state governments are funding a tower. Millions of dollars could be put to much better use than to build a tower at Aurora.

I would encourage citizens to take a look at what has happened at the Hillsboro airport. The "improvements" being adopted here are designed to promote private aviation business interests such as flight training or aviation hobbyists whose comfortable lifestyle allows them to own or rent private aircraft.

I am against lengthening or strengthening the runway, the taking of farmland for hangers or the building of a tower. Attracting bigger jets or more aircraft only benefits a small minority and diminishes livability for those who live in the area. The no build option is best for the majority of citizens. The roads are already to busy and tax payers should not have to pay the cost of road and utility improvements, that only benefit a few private aviation businesses.

The Marion County Commissioners have demonstrated their support for aviation development over the environment, livable neighborhoods or protecting farmland. Clackamas County residents have not been given equal representation even though the airport expansion and development affects us as well as Marion County citizens.

The impact would be temp, but not for making large aircraft accessible. The environmental impact of a busier facility is a detriment to agriculture and to the livability of the entire area.

March 7, 2011

To: PAC of Aurora State Airport

I am concerned with increased noise and air pollution to nearby residents and potential disturbance to wildlife in the area if airport traffic is increased and more jets begin to use the airport. The small, local airport is already here, and we accept that once in a while a small jet flies in. But we are distressed that if it is opened to more and larger jets, our quality of life and property values will be diminished.

Perhaps the addition of a tower and/or runway extension would improve safety at the airport, but the increased noise levels of more jets using the airport are problematic. Jets that are really pounding to gain altitude would definitely affect noise levels. Plus, with the smaller planes that are currently using the airport there is almost no night-time traffic--I'm concerned that with more jets, we would have more noise and increased safety risk at night. I am also concerned about the possibility of more around the clock jet cargo traffic in the future.

The FAA performs extensive noise tests on hundreds of models that fly in the United States, making generalizations difficult. However, according to figures taken from FAA records, the median decibel level upon takeoff of all models of two common small jets, Learjet and Gulfstream, at 76 decibels, is somewhat higher than those of two common small propeller plane manufacturers, Piper and Cessna, at 69 decibels. Even a small increase in jet traffic would have an adverse noise impact. *(Longmont Ledger, April 23, 2010)*

Lorna Dove, who lives in Georgetown near Seattle, has devoted extensive hours toward researching and measuring chemicals like benzene and toluene, byproducts of jet fuel and plane exhaust. Dove's strongest ally has been the Agency for Toxic Substances and Disease Registry in Atlanta, which, after conducting a risk assessment of air quality in 1998, found that Georgetown residents had "a higher risk for leukemia and thyroid cancer" than the population at large. I would like to see studies of environmental impact of increased air traffic on our area. *(The Stranger, July 2, 2008)*

Our area is called French Prairie. Let's talk about the historical significance of this area and the importance of preserving it. A larger commercial airport will undermine the agricultural character and general livability of our community.

Look at CAAP (Citizens Against Airport Pollution), a community based organization that seeks to reduce pollution caused by airport operations.

July 20, 2010

Citizens Against Airport Pollution [CAAP] has filed a lawsuit against the City of San Jose because the City recently approved a major amendment to the Airport Master Plan without an Environmental Impact Report describing what adverse affect these amendments will have on the environment.

The suit alleges that the City failed to conduct the proper environmental investigation necessary prior to the approval of a major amendment to the Airport Master Plan, as required by CEQA. Air pollution impacts, noise pollution impacts and impacts on wildlife are unknown. In an effort to avoid litigation, CAAP previously requested the City to defer action approving the major amendment so that these issues could be evaluated and discussed without litigation. The City chose to ignore these concerns and approved the major amendment to the Airport Master Plan without a clear understanding of its impact on the environment.

For over 20 years, Citizens Against Airport Pollution has been the only watchdog organization committed to protecting the environment from pollution caused by Mineta San Jose International Airport. CAAP has always supported a first class airport to serve the needs of the Southbay. Protecting the quality of life for San Jose residents and maintaining a first class airport is doable. However, it requires thoughtful planning and a keen sensitivity to environmental protections. If Silicon Valley is to become the center of "green" technology, the City of San Jose must make every effort to make its airport environmentally sensitive and a good neighbor. CAAP believes that the protection of the quality of life in the neighborhoods should be the highest priority to the City of San Jose. http://www.caap.org/

I hope the ones who finally make the decision in this matter will take into consideration the appeals of their neighbors, and not jeopardize their ability to continue living comfortably in their homes. Please slow down the premature rush to expand this airport.

Patti Oleson
7465 SW Bunker Post Ct.
Wilsonville, OR 97070

AOPA MAGAZINE - MAR. 2011

LOGBOOKENTRY | COMMENTARY

BY ROBERT E. BREILING
FOUNDER, ROBERT E. BREILING ASSOCIATES

Statistics that improve safety

Compiling business jet and turboprop accident statistics has been an objective of mine since the early 1960s. When I was a Navy carrier pilot and safety officer—and later a Pan Am pilot—I met an insurance executive who was concerned about insuring the new business jets and turboprops being bought by corporations. As I had some 3,000 hrt flight hours, I was retained as a consultant by the underwriter to visit and evaluate its operations. When Pan Am furloughed junior pilots, I went to work for the insurance underwriter to perform new-aircraft analyses, establish an engineering department, and supervise the company's fleet of 12 piston aircraft. There I began to compile business turbine aircraft statistics.



More than 50 percent of the bizjet accidents and incidents continue to occur in the landing phase year after year (for turboprops, it's 43 percent).

During this period I served on the NBAA board of directors, as head of its safety committee, and made numerous statistical presentations at Flight Safety Foundation's Corporate Aviation Safety Seminar, Bombardier's Safety Standdown, and others. I also worked with Donald Engen to establish the AOPA Air Safety Institute's light aircraft database.

I was then offered an opportunity to join the start-up team of SimuFlite, where one of my objectives was to secure an FAA exemption to use "advanced" simulators for training in lieu of aircraft. I showed the FAA that 52 business-jet accidents occurred during in-aircraft training from 1964 through 1980. We received the exemption, which benefitted both SimuFlite and FlightSafety International, the two training companies at the time. The accident rate began to fall (improve) so much that underwriters offered a reduced hull rate if companies trained in advanced simulators for both jets and turboprops. In 1985 we saw a need for this data by aviation insurance underwriters and corporate operators and began publishing our *Annual Business Turbine Aircraft Accident Review*, where we identified by specific aircraft the accident rates, phase of operation in which the accident occurred, causal factors, and other pertinent information.

In review of this data over the years, we found several dominant trends. For example, more than 50 percent of the bizjet accidents and incidents continue to occur in the landing phase year after year (for turboprops, it's 43 percent). Surprisingly, 76 percent of the jet accidents occur on 5,000-foot or longer runways, 10 percent on 4,000- to 5,000-foot-long runways, and 8 percent on runways shorter than 4,000 feet. Sixty-five percent were in VMC, and 24 percent were on contaminated runways. It is obvious that pilots are not adhering to positive landing techniques. They continue to land long, add a few knots to V_{REF}—which is already 30 percent above stall speed—"grease it on," delay reverser use, and use positive braking.

With respect to turboprops, accidents in the approach phase are higher with 17.6 percent occurring here, versus 7 percent in bizjets. My opinion is that many approach accidents involve single pilots, where it is apparent that the pilot gets to minimums and, being unfamiliar with the missed approach procedure, goes lower or performs an improper missed approach. I might add that single pilots have a 50-percent greater accident rate than aircraft flown by two pilots.

Single-engine turboprops, mostly flown by single pilots, are involved in a higher number of high-altitude upsets than other turboprops. It seems apparent that pilots are over-relying on the autopilot and when a malfunction occurs, loss of control follows. More instrument flight proficiency and upset training may be necessary.

Also noted over the years is that the number of reported incidents is increasing, and many result in serious damage. It is interesting to note that a turboprop can land gear up, and cause serious damage, yet this is classified as an incident—whereas a light jet can experience a gear collapse while taxiing, causing relatively light damage, and it is classified as an accident.

We believe that our annual reviews are invaluable to any bizjet or turboprop operator to aid in identifying specific aircraft problems, support the fact that short runways should not be used, and illustrate how business aviation safety compares to charter air taxi, fractionals, airline operations, single-pilot involvement, et cetera.

We publish the review annually and offer the complete study, including turbine helicopters, for $375; the jet section or turboprop section can be purchased separately for $175 each. For more see our website (www.breilinginc.com) or call us at 561-338-6900. AOPA

From: RobrtC@aol.com [mailto:RobrtC@aol.com]
Sent: Monday, March 21, 2011 3:03 PM
To: christopher.cummings@state.or.us
Cc: Anderson, Rainse
Subject: Comment: Aurora State Airport Master Plan

I attended the meeting earlier this month but unfortunately could not stay for the public comment portion that was begun at the end of the meeting.

One of the questions I have and I posed it to several people at the breakout session: Why is the Aurora Airport the subject of expansion when McNary Field is 20 miles away and has an existing longer runway than Aurora? Most of the responses to my questions were "convenience and closer to downtown Portland". I think that the overall public may be better served by exploring the options of McNary Field in Salem instead of embarking on this costly expansion.

If this expansion at Aurora proceeds the State of Oregon needs to impose stringent and enforced noise abatement procedures for the surrounding neighborhoods. This would mean monitoring by the control tower of violators and the imposition of fines and or license suspensions for pilots of aircraft that do not comply. To help with noise abatement the arrival/departure flight path from/to the north should be directed over the I-5 corridor and not Wilsonville.

Lastly, has an environmental impact study been conducted as to the affects of wildlife on airport operations. This area of the Willamette valley is a

large flyway for Canada geese. Wouldn't this be a safety issue?

I would appreciate your thoughts on my comments.

Rob Callan

7260 SW Fountain Lake Drive.

Wilsonville Oregon. 97070

Adrienne DeDona

From: Joel Joslin [joelandlynell@mac.com]
Sent: Monday, March 21, 2011 10:23 PM
To: Adrienne DeDona
Subject: Aurora Airport

Dear Adrienne,

Thank you for taking the time to listen to the residents concern about the proposed expansions to the Aurora airport.

I live nearby in an area that is supposed to be a "no fly" zone. It is anything but. We have planes flying over frequently and sometimes very low.
Low enough on occasion that I am concerned they are in distress and are about to crash.

An expansion would only increase these problems with the addition of increased jets and larger planes in the area and the subsequent noise issues.

It seems there are enough larger airports in the vicinity already with PDX and Hillsboro, both with greater activity and facilities than here.
Please do not turn this area into another large airport and all the noise and safety issues that would go with it.

Keep us safe and quiet!

Thank you for taking our welfare into your consideration.

A local resident and neighbor of the Aurora Airport.

Lynell Cooper-Joslin
Charbonneau

I, Kenneth W. Hawken agree with the proposal noted below. Please add my name to the petition.
my address :
24751 NE Prairie View Dr.
AURORA, OR 97002-9545
Phone 503-678-2280

Aurora Airport Master Planning Process
Petition to the Oregon Department of Aviation
from
Aurora Airport Neighbors in the Prairie View Community

Whereas, the Aurora State Airport lies less 1 1/2 miles south of the Prairie View residential community and over-flights of Prairie View are already frequent and noisy and

Whereas, the Oregon Department of Aviation is considering the possible inclusion of an extension of the existing runway and/or strengthening the runway to accommodate heavier aircraft in the current master planning process,

We, the undersigned residents of Prairie View support the petition from Charbonneau residents and express our grave concern about the number of larger jets that such an extension would bring, with the resultant increase in noise pollution for neighboring communities. We oppose such action for the following reasons:

1. At this airport, landings to the south require jets and others to fly low over dense residential areas of Wilsonville and surrounding communities. The proposed control tower, operating only during daylight hours, will not be able to fully mitigate this problem.

2. The environmental impact of a runway extension or strengthening, bringing additional and larger jet traffic, will be to reduce property values for many Wilsonville residents including those living in Charbonneau and Prairie View.

3. The extension proposed is sought by a very small number of operators, most of whom regularly use its current runway. At a time of extreme State and Federal budget difficulties it is unacceptable to consider spending large sums of taxpayer money on development to benefit so few special interests.

4. This Airport is constrained on all sides by roads and residences, by one runway, and by private infrastructure close to the taxiway and runway, all hampering long term expansion. For example, it is not practically possible, nor financially feasible, to reduce the approach minimums, something that would make the Airport a more reliable destination in bad weather. If a longer runway is required in the region this should be done at a rural area airport with many fewer constraints, such as Mulino.

For all the above reasons we request that consideration of a runway extension and/or strengthening the weight-bearing load of the runway at Aurora Airport be postponed to allow study of the most appropriate location and timing for such developments and any extension or strengthening be excluded from the current Master Plan update.

To who it may concern, we agree with the proposal below.

Stanley P. Kaveckis
25031 NE Prairie View Drive
Aurora, OR 97002

Suzanne M. Kaveckis
25031 NE Prairie View Drive
Aurora, OR 97002

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Louisa Farmer
25089 N.E. Prairie View Drive
Aurora, Oregon 97002

Michael Farmer
25089 N.E. Prairie View Drive
Aurora, Oregon 97002

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I, Karen J. Hawken agree with the proposal noted below. Please add my name to the petition.

My address:
24751 NE Prairie View Drive
Aurora, OR 97002
Phone 503-678-2280

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I agree with this proposal:
Dana Stephens
14550 NE Mulligan Ct.
Aurora, OR 97002

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I agree with the proposal noted below and would like to add the following:

As a tax paying citizen, it is appalling to me that millions are going to be spent to build a tower at the Aurora Airport. It is obvious the ODA at the State of Oregon and the FAA will promote private aviation business interests over those of neighboring property owners. Marion County should not legally be allowed to expand the airport when it affects the residents of Clackamas County without equal representation. Sitting on an advisory committee outnumbered by airport business interests is not representation.

IT IS THE SPECIAL INTERESTS OF A SMALL MINORITY THAT BENEFITS BY DIMINISHING THE RIGHTS AND LIVIBILITY OF PROPERTY OWNERS.

Christine Warren
15777 NE Becke Rd
Aurora, Or 97002

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2. The environmental impact of a runway extension or strengthening, bringing additional and larger jet traffic, will be to reduce property values for many Wilsonville residents including those living in Charbonneau and Prairie View.

3. The extension proposed is sought by a very small number of operators, most of whom regularly use its current runway. At a time of extreme State and Federal budget difficulties it is unacceptable to consider spending large sums of taxpayer money on development to benefit so few special interests.

4. This Airport is constrained on all sides by roads and residences, by one runway, and by private infrastructure close to the taxiway and runway, all hampering long term expansion. For example, it is not practically possible, nor financially feasible, to reduce the approach minimums, something that would

make the Airport a more reliable destination in bad weather. If a longer runway is required in the region this should be done at a rural area airport with many fewer constraints, such as Mulino.

For all the above reasons we request that consideration of a runway extension and/or strengthening the weight-bearing load of the runway at Aurora Airport be postponed to allow study of the most appropriate location and timing for such developments and any extension or strengthening be excluded from the current Master Plan update.

BERNICE IVEY
24780 NE PRAIRIE VIEW
AURORA, OR 97002

Petition to the Oregon Department of Aviation

from

Aurora Airport Neighbors in the Prairie View Community

Whereas, the Aurora State Airport lies less 1 1/2 miles south of the Prairie View residential community and over-flights of Prairie View are already frequent and noisy and

Whereas, the Oregon Department of Aviation is considering the possible inclusion of an extension of the existing runway and/or strengthening the runway to accommodate heavier aircraft in the current master planning process,

We, the undersigned residents of Prairie View support the petition from Charbonneau residents and express our grave concern about the number of larger jets that such an extension would bring, with the resultant increase in noise pollution for neighboring communities. We oppose such action for the following reasons:

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For all the above reasons we request that consideration of a runway extension and/or strengthening the weight-bearing load of the runway at Aurora Airport be postponed to allow study of the most appropriate location and timing for such developments and any extension or strengthening be excluded from the current Master Plan update.

I agree with the proposal noted below.
Victoria Arck
24035 Butteville Rd, Aurora, OR 97002

>if you want to send me the petition, I will sign it. The points
>addressed are significant and will affect all tax payers. Even 'tho
>I live quite a distance from the A/P I am concerned!
>Vik

> > Aurora Airport Master Planning Process
> >
> > Petition to the Oregon Department of Aviation
> >
> > from
> >
> > Aurora Airport Neighbors in the Prairie View Community
> >
> >
> >
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> >
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> >at Aurora Airport be postponed to allow study of the most
> >appropriate location and timing for such developments and any
> >extension or strengthening be excluded from the current Master Plan update.
> >
> >=

We agree with the proposal noted below:
Hellen Safronchik
15651 NE Browndale Farm Rd,
Aurora, Oregon 97002

Paul Safronchik
15651 NE Browndale Farm Rd
Aurora, Oregon, 97002

Rebecca Safronchik
15651 NE Browndale Farm Rd
Aurora, Oregon, 97002

Alexander Safronchik
15651 NE Browndale Farm Rd
Aurora, Oregon 97002

In a message dated 3/5/2011 5:04:08 P.M. Pacific Standard Time,
berniceativeyacres@hotmail.com writes:

Aurora Airport Master Planning Process

Petition to the Oregon Department of Aviation from Aurora Airport Neighbors in the Prairie View Community

Whereas, the Aurora State Airport lies less 1 1/2 miles south of the Prairie View residential community and over-flights of Prairie View are already frequent and noisy and

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=

Bernice,

First a thank you for all the time and effort you put in for all of our sakes. We both appreciate it.

We agree with the attached proposal, namely the Petition to the Oregon Department of Aviation from the Aurora Airport Neighbors in the Prairie View Community.

Robert C. Brooks 14510 NE Mulligan Court, Aurora, OR 97002
Susan G. Brooks 14510 NE Mulligan Court, Aurora, OR 97002

Thank you.

Aurora Airport Master Planning Process
Petition to the Oregon Department of Aviation
from
Aurora Airport Neighbors in the Prairie View Community

Whereas, the Aurora State Airport lies less 1 1/2 miles south of the Prairie View residential community and over-flights of Prairie View are already frequent and noisy and

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Aurora State Airport Master Plan Update
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Additional Comments:

The Number of Air operations Does not Justify the long Hauling of the Runway
I Support the 'no Build' Alternate with the Exception of the Aurora Rural Fire District Facility - I am an Elected Board Member of the Fire District.
Aurora was never Intended to Be a 'Big Jet' Airport. It is Too Constrained Both in length & Width. GREG LEO

Contact Information (optional):

Name: GREG LEO
Address: 9318 Champoeg Road N.E.
Aurora OR 97002
Phone: (503) 804-6391
Email: GREG@TheLeoCompany.com

Thank you for taking the time to provide your input!

Please drop this form in the comment box, or mail to:

Adrienne DeDona
1110 SE Alder Street, Suite 301
Portland, OR 97214
Or fax to: (503) 230-4877
You can also email comments to: Adrienne@jla.us.com

Aurora State Airport Master Plan Update
COMMENT FORM

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critical addition

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Additional Comments:

Contact Information (optional):

Name: _____

Address: _____

_____

Phone: _____

Email: _____

Thank you for taking the time to provide your input!

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Additional Comments:

Would like C-2, but don't think closing Keil Rd a good idea, increase traffic on ~~Butteville~~ Airport Rd. Parlee 600' extension to North

Contact Information (optional):

Name: Rob Graham

Address: 21404 Liberty
Aurora

Phone:

Email: robbyly@yahoo.com

Thank you for taking the time to provide your input!

Please drop this form in the comment box, or mail to:

Adrienne DeDona
1110 SE Alder Street, Suite 301
Portland, OR 97214

Or fax to: (503) 230-4877

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Additional Comments: No additional Growth.

Contact Information (optional):

Name: Rick Hardman

Address: 21124 Liberty St NE
Aurora Or. 97004

Phone: 503-276-9040

Email:

Thank you for taking the time to provide your input!

Please drop this form in the comment box, or mail to:

Adrienne DeDona
1110 SE Alder Street, Suite 301
Portland, OR 97214

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Additional Comments:

Contact Information (optional):

Name: _____

Address: _____

_____

Phone: _____

Email: DICKSPENCE72@GMAIL.COM

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Email: _____

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Portland, OR 97214

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7

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Additional Comments:

~~Option~~

600 Ft. Extension to begin with to the North.

After a term of 5 years to help replenish funds Extend an additional 600 Ft on the south end.

(save Keil Rd.)

Contact Information (optional):

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Address: _____

_____

Phone: _____

Email: _____

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Additional Comments:

roads are already overcapacity!

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ALTERNATIVE 2 AS DEPICTED PLACES A RWY 17 RUN-UP AREA ON WILEY CONDO ASSOCIATION PROPERTY VERY CLOSE TO EXISTING HANGARS WITH LARGE OPERABLE DOORS. THIS PROPERTY IS NOT FOR SALE AND IS NOT LIKELY TO BE. CONSIDERATION SHOULD BE GIVEN TO AN ALTERNATIVE THAT INCLUDES A 600' EXTENSION WITH RUN-UP AREA AT THE NORTHEND AND A 500' EXTENSION AT THE SOUTH END TO CREATE A 6000'+ RUNWAY WITH AN UPGRADE TO ARC C-II.

Contact Information (optional):

Name: LARRY BERGMAN

Address: 7814 SE 13TH AVE.
PORTLAND, OR 97202

Phone: 503-572-3832

Email: LARRY@BERGMANPHOTOGRAPHIC.COM

Thank you for taking the time to provide your input!

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Additional Comments:

Representing property south of airport "P" zone - south of Keil Road, totally approx. 75 acres ~~total~~.

JR

Contact Information (optional):

Name: JOHN RANKIN, Atty/Consultant

Address: 26715 SW Baker Road
Sherwood, OR 97140

Phone: 503-625-9710

Email: john@johnrankin.com

Thank you for taking the time to provide your input!

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Additional Comments:

Contact Information (optional):

Name: _____

Address: _____

_____

Phone: _____

Email: _____

Thank you for taking the time to provide your input!

Please drop this form in the comment box, or mail to:

Adrienne DeDona
1110 SE Alder Street, Suite 301
Portland, OR 97214

Or fax to: (503) 230-4877

You can also email comments to: Adrienne@jla.us.com

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Since you cut the trees down the noise is louder — trees important — support the tower & fire station DO EXPAND

Additional Comments:

I am very concerned about how the quality of my life will decrease because of the high noise along with the value of my property which will decrease. We live in Deer Creek Estates close to the end of the runway and in 10 years the noise has increased greatly. Please please take under consideration a short cut to Aurora

Contact Information (optional):

Name: Susan Mulvey

Address: 2013 NE Flora Rd
Aurora OR 97002

Phone: 503-678-2693

Email: _____

Thank you for taking the time to provide your input!

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Additional Comments:

THE REMOVAL OF THE TREES BY THE WEST OPEN UP MORE NOISE. I SUPPORT THE NO BUILD PLAN. THE TOWER AND FIRE STATION..

Contact Information (optional):

Name: BRION MURPHY

Address: 22013 NE FLORA AVE
AURORA OR 97002

Phone: 503-702-5567

Email: MOMYTOT YAHOO.COM

Thank you for taking the time to provide your input!

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Additional Comments:

home owner Aurora

Contact Information (optional):

Name: Marilee Sullivan

Address: PO Box 34
Aurora OR 97002

Phone: 503 678 2860

Email: ~~marilees~~ marilees@ipns.com

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Additional Comments:

WHY DON'T THEY DO SOMETHING AT THE AIRPORT TO ACTUALLY GET PILOTS OF JETS TO FLY THE PATTERN THEY ARE SUPPOSED TO.

Contact Information (optional):

Name: _____

Address: _____

_____

Phone: _____

Email: _____

Thank you for taking the time to provide your input!

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Additional Comments:

Contact Information (optional):

Name: Carol Dobbs

Address: 13711 NE Wisteria Dr
Aurora, OR

Phone: 503 348 2917

Email: dldobbs@centurytel.net

Thank you for taking the time to provide your input!

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Additional Comments:

property owner

Contact Information (optional):

Name: Dan Sullivan

Address: P.O. Box 34
Aurora OR 97002

Phone: _____

Email: _____

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Additional Comments:

Contact Information (optional):

Name: _____

Address: _____

_____

Phone: _____

Email: _____

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Adrienne DeDona
1110 SE Alder Street, Suite 301
Portland, OR 97214

Or fax to: (503) 230-4877

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Additional Comments:

PUBLIC-COMMENT

- Remove Power Lines on Northend.
- If the power lines were hit by a plane how would the loss of power to our community. Hospitals, schools, fire, police. Shared costs to re-locate lines underground. Power company, City + County, Oregon Aviation Dept.
- Educational Bldg for High School students interested in Aviation. Shared by Community Colleges + Education Districts. 2-Story Bldg.

I HAVE ADDITIONAL IDEAS. EMAIL ME PLEASE.

Contact Information (optional):

Name: RONALD STERBA

Address: 500 20th St NE
Salem, Or 97301

Phone: 503-559-3191

Email: SAINTESTERBA@MSN.COM

Thank you for taking the time to provide your input!

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already done or whose approval?

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Additional Comments:

Aurora is one of the most significant pieces of history in Ore.
Who benefits from a larger and busier airport?
Could you consider doing something in the line of keeping the integrity of this small historic piece? It doesn't lend itself to this noisy alternative. Take an example from Vermont and keep this historic jewel as the treasure it should be.

Lelle Braun
Frederick Reil House
21603 Airport Rd NE

Contact Information (optional):

Name: Lelle Braun
Address: 21883 Airport Rd.
Aurora OR. 97002
Phone: 678-6880
Email: rellabr@yahoo.com

Thank you for taking the time to provide your input!

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Additional Comments:

Any/all proposed changes need to consider/mitigate the problems that will come outside the "fence" area. Such as E-W traffic & turn lanes / drainage issues / sewer & water supplies & up to code, Noise & vectoring of traffic (air). If the above concerns aren't met, there will be many irate and vindictive neighbors to deal with going forward. Not a good situation!

Given present and near future econ. situation - we are better to not overbuild especially runway for the very few - the numbers of operations is still highly questionable! Use your new tower to get accurate numbers prior to any B dd 243 are not warranted.

Contact Information (optional):

Name: R. Michael IVERSON - Aurora Farms

Address: 13490 Cedarwood Rd. Aurora, Or. 97002

Phone: 503-849-0662

Email: mikeiverson@centurytel.net

Thank you for taking the time to provide your input!

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Additional Comments:

- WHAT IS TAX PAYER LIABILITY FOR UNDER IMPROVEMENTS OF AIRPORT ROAD? FOR THE ENTIRE EXPANSION?
- WHAT ARE IMPACTS OF EXPANSION ON ADJACENT PROPERTIES? ZONING? USAGES?
- WHAT IS THE NUMBER OF REGULAR OPERATORS THAT LIVE IN CLACKAMAS/OR MARION COUNTY?
- WHAT WILL BE DONE TO PRIOR TO EXPANSION/ MOBILIZATION TO ENSURE CITY OF AURORA'S ANNEXATION OF AIRPORT?
- WHAT ARE THE WILDLIFE & ENVIRONMENTAL IMPACTS? WHAT ARE GUIDES COMPLETED?

Contact Information (optional):

Name: ANNIE KIRK

Address: PO BOX 83
AURORA, OR 97002

Phone:

Email: annie@redbirddesign.net

Thank you for taking the time to provide your input!

Please drop this form in the comment box, or mail to:

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Additional Comments:

Contact Information (optional):

Name: Steve Heer

Address: _____

_____

Phone: _____

Email: _____

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Additional Comments:

Contact Information (optional):

Name: Raj Savara

Address: 17970 Boyce Way
Lake Oswego OR

Phone: 503 701 4328

Email: RAJ@OMNIPALLET.COM

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WE HAVE HUNDREDS OF LARGE GEESE IN THE CHARBONNEAU AREA WHICH COULD POSE A SERIOUS THREAT TO AIRCRAFT AND CIVILIANS. I AM NOT CONCERNED ABOUT THE LIVES OF THE GEESE – ONLY THE PEOPLE. WE HAVE MORE THAN ENOUGH AIRCRAFT EMINATING FROM THIS AIRPORT NOW.

Contact Information (optional):

Name: MARGARET HARRINGTON
Address: 7240 SW FOUNTAIN LAKE DR
WILSONVILLE, OR 97070
Phone: 503. 694. 8196
Email: mehtassie@gmail.com

Thank you for taking the time to provide your input!

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Cargo Apron Location	☒ No change	☐ No change	☐ Designation of a cargo apron facility, north of Aurora Aviation.	☐ The cargo apron centrally located on State-owned property.

Additional Comments:

Contact Information (optional):

Name: Tony Holt

Address: 6670 SW Village Greens Circle, Wilsonville OR 97070

Phone:

Email: ajholt36@aol.com

Thank you for taking the time to provide your input!

Please mail this form to:

Adrienne DeDona
1110 SE Alder Street, Suite 301
Portland, OR 97214

Or fax to: (503) 230-4877

You can also email comments to: Adrienne@jla.us.com

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Additional Comments:

Contact Information (optional):

Name: Suzanne Rhudy

Address: [redacted]

Phone: 503-694-5534

Email:

Thank you for taking the time to provide your input!

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Additional Comments:

Contact Information (optional):

Name: Jerry & Deanna Springer

Address: 7400 S.W. Fairway Drive
Wilsonville, OR 97070

Phone: _____

Email: _____

Thank you for taking the time to provide your input!

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Additional Comments:

Contact Information (optional):

Name: Julian Erwin

Address: (sent by email)

Phone:

Email:

Thank you for taking the time to provide your input!

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Contact Information (optional):

Name: WM A. MARQUARD

Address: 32775 SW TRAMS RD
WILSONVILLE

Phone: _____

Email: _____

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TO APPROVE ANY CHANGES IS "LETTING THE CAMEL IN THE TENT!" GOOD, BAD INDIFFERENT THE FUTURE CANNOT BE CONTROLLED. SURE A TOWER & INSTRUMENT APPROACH WOULD ENHANCE SAFETY - BUT THATS THE CAMEL -

Contact Information (optional):

Name: FRED PRESTON

Address: 32100 SW EASTMAN PL
WILSONVILLE 97070

Phone: 503 694 5325

Email:

Thank you for taking the time to provide your input!

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Additional Comments:

Contact Information (optional):

Name: Ruth Haire

Address: 7295 East Lake Ct
Wilsonville OR

Phone: 503 694-5711

Email: —

Thank you for taking the time to provide your input!

Please mail this form to:
Adrienne DeDona
1110 SE Alder Street, Suite 301
Portland, OR 97214
Or fax to: (503) 230-4877
You can also email comments to: Adrienne@jla.us.com

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Additional Comments:

I have had enough as it is of planes flying over Charbonneau. I came here from Beaverton because of the rural atmosphere and less crowding. Why must it always be ruined?

Contact Information (optional):

Name: Janet Crawford

Address: 32625 S.W. Lake Point Ct.
Wilsonville, OR 97070

Phone:

Email:

Thank you for taking the time to provide your input!

Please mail this form to:
Adrienne DeDona
1110 SE Alder Street, Suite 301
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Additional Comments:

Contact Information (optional):

Name: Ricki Nicholson

Address: 7270 SW East Lake Ct.
Wilsonville OR

Phone: 503-694-2824

Email: Ricki5@Comcast.Net

Thank you for taking the time to provide your input!

Please mail this form to:
Adrienne DeDona
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Portland, OR 97214
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Additional Comments:

It is hard for me to believe that fuel tax would pay for all the proposed changes. As a tax payer I don't want to have any part of paying for the ability to have more coperate jets landing at the Aurora Airport!

Contact Information (optional):

Name: Ryland Ottinger
Address: 3102 S.W. Country View Ln
Wilsonville, Oregon 97070
Phone: 503-694-2599
Email:

Thank you for taking the time to provide your input!

Please mail this form to:
Adrienne DeDona
1110 SE Alder Street, Suite 301
Portland, OR 97214
Or fax to: (503) 230-4877
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Additional Comments:

NO MORE NOISY PLANES OVER CHARBONNEAU !

Contact Information (optional):

Name: JUDY ERSCHEN

Address: CHARBONNEAU

Phone:

Email:

Thank you for taking the time to provide your input!

Please mail this form to:
Adrienne DeDona
1110 SE Alder Street, Suite 301
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Additional Comments: Some Charbonneau residents are curious when we see the map showing the Sound Pressure Level (yellow line) following the exact southern boundy of Charbonneau. Also at the DOA meeting we heard SPL/Db numbers for aircraft on this boundy to be 65 or 75 Db. Institutions such as MIT and HUD have said that the Db for flushing a toilet is 75 Db and a business office is 85 Db. I have a hard time believing that the planes going over as we dine on our patios are more quiet than a toilet or a business office.

We have taken a straw poll of Charbonneau residents at a recent social function and well over 95% of us are strongly opposed to the airport expansion!

Contact Information (optional):

Name: LARRY EISCHEN

Address: 31127 SW FRENCH PRAIRIE ROAD
WILSONVILLE, OR 97070

Phone: 503 694-6322

Email:

Thank you for taking the time to provide your input!

Please mail this form to:
Adrienne DeDona
1110 SE Alder Street, Suite 301
Portland, OR 97214
Or fax to: (503) 230-4877
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Additional Comments:

Contact Information (optional):

Name: Verna / Henry Jansen

Address: 32185 SW Eastlake Point
Wilsonville, Oregon 97070

Phone: 503-694-2690

Email:

Thank you for taking the time to provide your input!

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Additional Comments:

The noise level now is too high with low flying planes and helicopters who dont seem to care that people would very much appreciate a quiet neighborhood in which to find refuge. It's unfortunate that we in Clackamas County must suffer the consequences of Marion County decisions on this matter. More planes also mean more cars + trucks on our exits and entrances to the I 5 corridor which is awful right now as it is

Contact Information (optional):

Name: NANCY McELWAIN

Address: 7235 SW FOUNTAIN LAKE DR
WILSONVILLE, OR 97070

Phone: _____

Email: _____

Thank you for taking the time to provide your input!

Please mail this form to:
Adrienne DeDona
1110 SE Alder Street, Suite 301
Portland, OR 97214
Or fax to: (503) 230-4877
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Additional Comments:

Contact Information (optional):

Name: Mr. Jerry J Vasquez

Address: 7555 SW FAIRWAY DR
Wilsonville, OR. 97070

Phone: 503-931-2084

Email:

Thank you for taking the time to provide your input!

Please mail this form to:
Adrienne DeDona
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Additional Comments:

Rw 17 runup area on Alternative 2 not desirable to owners of Wylee property. It would add constant noise & blast to adjacent hangars. Better solution must be found -- preferably adjacent to Willamette Aviation facility on runway extension to north.

Contact Information (optional):

Name: Bruce Bergman

Address: 14758 SE Garland Ln
Milwaukie, OR 97267

Phone: 503-572-3831

Email: bruce@bergmanphotographic.com

Thank you for taking the time to provide your input!

Please drop this form in the comment box, or mail to:

Adrienne DeDona
1110 SE Alder Street, Suite 301
Portland, OR 97214

Or fax to: (503) 230-4877

You can also email comments to: Adrienne@jla.us.com

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Additional Comments:

Contact Information (optional):

Name: WILLIAMSON, Bud

Address: 31441 SW VILLAGE GREEN CT
WILSONVILLE, OR 97070

Phone: 503-694-2425

Email: NA

Thank you for taking the time to provide your input!

Please mail this form to:
Adrienne DeDona
1110 SE Alder Street, Suite 301
Portland, OR 97214
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53

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Additional Comments:

Contact Information (optional):

Name: Kay Williamson

Address: 31441 SW Village Green Ct
Wilsonville, OR

Phone: 503-694-2425

Email: kfarwill@comcast.net

Thank you for taking the time to provide your input!

Please mail this form to:
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Additional Comments:

Contact Information (optional):

Name: Margaret Jessica Taft

Address: 32625 S.W. Lake Rt. Ct.
Wilsonville, Or. 97070

Phone: _____

Email: _____

Thank you for taking the time to provide your input!

Please mail this form to:
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Additional Comments: IT IS MY FEELING THAT MOST CHARBONNEAU RESIDENTS HAVE LITTLE SYMPATHY FOR THE NEEDS AND WISHES OF USERS OF THE AURORA AIRPORT, BECAUSE PILOTS PRESENTLY FLYING IN AND OUT OF THE AIRPORT JUST DONT GIVE A SHIT ABOUT AVOIDING THE AIRSPACE ABOVE CHARBONNEAU. IMPROVED FACILITIES CAN ONLY MEAN CONTINUED DISREGARD FOR THE NEIGHBORHOOD, IN A LARGER SCALE.

J A Brickner

Contact Information (optional):

Name: J. A. BRICKNER

Address: 32145 SW EASTLAKE PT
WILSONVILLE, OR 97070

Phone: 503 694 1363

Email: JBANDCLARY@CENTURYTEL.NET

Thank you for taking the time to provide your input!

Please mail this form to:
Adrienne DeDona
1110 SE Alder Street, Suite 301
Portland, OR 97214
Or fax to: (503) 230-4877
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Address: _____

_____

Phone: _____

Email: _____

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Additional Comments:

Contact Information (optional):

Name: EDWARD MILLER

Address: 7555 SW MIDDLE GROVE RD
WILSONVILLE OR 97070

Phone: _____

Email: _____

Thank you for taking the time to provide your input!

Please mail this form to:
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Additional Comments:

Contact Information (optional):

Name: Kathleen Miller

Address: 7555 SW Middle Grove Rd.
Wilsonville, OR

Phone: 503

Email:

Thank you for taking the time to provide your input!

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LOCATE AT MID-FIELD WEST OF THE HI-WAY TO HUBBARD. WILL REQUIRE ADDITIONAL LAND AND WILL REQUIRE TOWER HEIGHT WITH NO LOSS OF 2 ACRES OF AIRPORT LAND

59

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Additional Comments:

A RESONABLE RETURN ON INVESTMENT SHOULD ALWAYS BE A PARAMOUNT CONSIDERATION WHERE MAJOR INVESTMENT IS REQUIRED. I DONT FEEL THAT HAS HAPPENED WHEN CONSIDERATION FOR RUNWAY STRENGHENING OR EXTENSION IS BEING CONSIDERED. TO SPEND MILLIONS OF DOLLARS FOR THE POSSIBILITY OF VERY SMALL RETURN ON INVESTMENT MAKES NO SENSE, ESPECIALLY WHEN BOTH THE STATE ~~AND OR~~ FEDERAL GOVERNMENT IS BROKE. LETS GET REALISTIC.

Contact Information (optional):

Name: JACK E. KAHLE

Address: 7545 DOWNS POST RD
WILSONVILLE, OR. 97070

Phone: 503-694-8022

Email: JACKEKAHLE@YAHOO.COM

AURORA PILOT & OWNER OF HANGARS & AIRCRAFT AT UAO,

Thank you for taking the time to provide your input!

Please mail this form to:
Adrienne DeDona
1110 SE Alder Street, Suite 301
Portland, OR 97214
Or fax to: (503) 230-4877
You can also email comments to: Adrienne@jla.us.com

Aurora State Airport Master Plan Update
COMMENT FORM

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Additional Comments:

Contact Information (optional):

Name: Chris Brand

Address: PACIFIC COAST AVIONICS
22783 AIRPORT RD. N.E.
AURORA, OR 97002

Phone:

Email: chris@pca.aero

Thank you for taking the time to provide your input!

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Additional Comments:

Contact Information (optional):

Name: DEWEY CONROY

Address: ~~PACIFIC COAST AVIONICS~~
22783 AIRPORT RD. N.E.
AURORA, OR 97002

Phone: ~~503 678 6242~~

Email: DEWEY@PCA.AERO

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Additional Comments:

Contact Information (optional):

Name: Tim Conroy
Address: 508 NE 139th St
Vancouver, WA 98684
Phone: 360-910-6698
Email: tim.conroy@comcast.net

Thank you for taking the time to provide your input!

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Additional Comments:

Contact Information (optional):

Name: Jim Matsies

Address: 14375 S. Donovan Rd

Oregon City, OR 97045

Phone:

Email: premierair@comcast.net

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Additional Comments:

A TOWER & RUNWAY EXT. IS NOT SO — good IN THIS CLIMATE.

Contact Information (optional):

Name: PETER HOFF

Address: 7450 SW BUNKER POINT WILSONVILLE OR 97070

Phone: 503 694 5392

Email: PJHOFF43 @ COMCAST.NET

I OWN PROP. AT AURORA AIRPORT

PILOT

Thank you for taking the time to provide your input!

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ALL OF THESE ARE THE SAME.

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Additional Comments:

WHO WROTE THIS? OUR BIGGEST PROBLEM IS PEOPLE WHO DON'T HAVE A CLUE ABOUT AVIATION WRITE QUESTIONAIRS LIKE THIS. GET SOMEONE ENVOLVED IN AVIATION TO HELP MAKE AIRPORT PROGRAMS!! YOU ARE WASTING OUR MONEY.

Contact Information (optional):

Name: RICH WARDEN

Address: 24328 SKYLANE
CANBY OR 97013

Phone: 503-263-8510

Email:

Thank you for taking the time to provide your input!

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Additional Comments:

Contact Information (optional):

Name: TERRY B LYONS

Address: W. Sandy, Ore

Phone: 503-701-0640

Email: TERRY@OREGONSMOKEDFOODS.COM

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Additional Comments:

Justify All Projects by Cost.

Contact Information (optional):

Name: Merrynt. Henkes

Address: 32200 SW French Prairie

Property Owner D-110

Phone: 503 3602607

Email: Mers98a@MSN.com

Thank you for taking the time to provide your input!

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Additional Comments:

The noise over our house is BAD enough as it is. I certainly don't want any increase!

I wish there were no Aurora Airport at all.

Contact Information (optional):

Name: Marilou Baughman

Address: 27109 SW Aden Ave.
Wilsonville, OR 97070

Phone: 503-582-8328

Email: lulieray@yahoo.com

Thank you for taking the time to provide your input!

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69

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Additional Comments:

Any changes will only benefit a small number of users of the Airport, not the general public.

Contact Information (optional):

Name: Ray Cooper

Address: 27105 SW Airlane

Wilsonville

Phone:

Email: R2Cooper@yahoo.com

Thank you for taking the time to provide your input!

Please mail this form to:
Adrienne DeDona
1110 SE Alder Street, Suite 301
Portland, OR 97214
Or fax to: (503) 230-4877
You can also email comments to: Adrienne@jla.us.com

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Additional Comments:

Contact Information (optional):

Name: Mark Deatherage

Address: 101 Azalea Drive
Grants Pass OR 97526

Phone: 541 474 6904

Email: drmark@budget.net

Thank you for taking the time to provide your input!

Please mail this form to:
Adrienne DeDona
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Additional Comments:

Contact Information (optional):

Name: Ed & Carol Dey

Address: 32150 SW East Lake Pt.
Wilsonville, OR 97070

Phone: 503-694-6663

Email: deyew@comcast.net

Thank you for taking the time to provide your input!

Please mail this form to:
Adrienne DeDona
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Additional Comments:

Contact Information (optional):

Name: Mr. Frank M. Burger

Address: 14995 NE Lawnview Cir
Aurora, OR 97002-8526

Phone: 503-678-4393

Email: FBurger47@yahoo.com

Thank you for taking the time to provide your input!

Please mail this form to:
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Additional Comments:

We hope that the airport is not enlarged! There is enough jet noise now over Charbonneau!

Contact Information (optional):

Name: Jean Cravens

Address: 7250 SW Lakeside Dr
Wilsonville 97070

Phone: _____

Email: _____

Thank you for taking the time to provide your input!

Please mail this form to:
Adrienne DeDona
1110 SE Alder Street, Suite 301
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Additional Comments:

Larger Jets = More Noise

Contact Information (optional):

Name: Edward Graham

Address: 8250 S.W. Lakeside Lp.
Wilsonville, OR 97070

Phone: _____

Email: _____

Thank you for taking the time to provide your input!

Please mail this form to:
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1110 SE Alder Street, Suite 301
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Additional Comments:

Contact Information (optional):

Name: Jeannette Ross

Address: 31594 Country View Ln.

Phone: 503) 678-5516

Email:

Thank you for taking the time to provide your input!

Please mail this form to:
Adrienne DeDona
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Additional Comments:

RUNWAY EXTENSION - PARTICULARLY TO NORTH- WILL RESULT IN HEAVIER NOISIER AIRCRAFT TAKING OFF CLOSER (& LOWER OVER) POPULATED AREAS. NOISE PROBLEM. ENVIRONMENTAL PROBLEM. SAFETY PROBLEM.

PLEASE DO NOT EXTEND RUNWAYS

Contact Information (optional):

Name: FRED & JEAN CATERINA

Address: 31153 SW COUNTRY VIEW LN
WILSONVILLE

Phone: 503-694-8145

Email: fjcaterina@aol.com

Thank you for taking the time to provide your input!

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Additional Comments:

Planes are flying over Charbonneau even though they are required not to. EXPANSION would only increase the noise level in this area. THINK OF the noise level at our PORTLAND INTERNATIONAL AIRPORT. We DON'T need TO push IN that direction.

Thanks

Contact Information (optional):

Name: Joel Joslin

Address:

Phone: 503-694-2403

Email: JeJoslin@earthlink.net

Thank you for taking the time to provide your input!

Please mail this form to:
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Additional Comments:

Contact Information (optional):

Name: Philip Rissel

Address: P.O. Box 2533
Wilsonville, OR 97070

Phone: (503) 780-4916

Email: Phil@flying-hconstruction.com

Thank you for taking the time to provide your input!

Please drop this form in the comment box, or mail to:

Adrienne DeDona
1110 SE Alder Street, Suite 301
Portland, OR 97214

Or fax to: (503) 230-4877

You can also email comments to: Adrienne@jla.us.com

Aurora State Airport Master Plan Update
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Additional Comments:

Contact Information (optional):

Name: Valerie F. Granum

Address: 3154 S. Old Country Rd. Ln
Woodville, Or. 97470

Phone: (503) 69[illegible]-2550

Email:

Thank you for taking the time to provide your input!

Please mail this form to:
Adrienne DeDona
1110 SE Alder Street, Suite 301
Portland, OR 97214
Or fax to: (503) 230-4877
You can also email comments to: Adrienne@jla.us.com

80

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Additional Comments:

AIRCRAFT coming and going creates A worsening noise problem for those OF US who live in Charbonneau

MAKING the Changes sought will only MAKE a BAD Problem worse!

Contact Information (optional):

Name: Bill Benedetto

Address: 7140 SW Arbor Lake Drive

Wilsonville, OR 97070

Phone: 503.694-2486

Email: AJXBillC@AOL.Com

Thank you for taking the time to provide your input!

Please mail this form to:
Adrienne DeDona
1110 SE Alder Street, Suite 301
Portland, OR 97214
Or fax to: (503) 230-4877
You can also email comments to: Adrienne@jla.us.com

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Additional Comments:

I trust you will not move North. It would be too close to a population of a growing city (Wilsonville and Tualatin).

Contact Information (optional):

Name: Sally A. Kingston
Address: 7140 SW Arbor Lake Dr.
Wilsonville, OR 97070
Phone: 503-694-6410
Email: rabbit38@aol.com

Thank you for taking the time to provide your input!

Please mail this form to:
Adrienne DeDona
1110 SE Alder Street, Suite 301
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Additional Comments:

See submitted letter + petition from Friends of French Prairie,

Contact Information (optional):

Name: BEN WILLIAMS

Address: 23013 Geary Lane NE
Aurora OR 97002

Phone: 503.585.5670

Email: ben.williams@liturgica.com

Thank you for taking the time to provide your input!

Please drop this form in the comment box, or mail to:

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1110 SE Alder Street, Suite 301
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Additional Comments:

Contact Information (optional):

Name: SHIRLEY MACMILLAN

Address: 7315 SW ARBOR LAKE DR.
WILSONVILLE OR 97070

Phone: _____

Email: _____

Thank you for taking the time to provide your input!

Please mail this form to:
Adrienne DeDona
1110 SE Alder Street, Suite 301
Portland, OR 97214
Or fax to: (503) 230-4877
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Additional Comments:

Contact Information (optional):

Name: IAN C MAC MILLAN

Address: 7315 ARBOR LAKE DRIVE
WILSONVILLE OR 97070

Phone:

Email:

Thank you for taking the time to provide your input!

Please mail this form to:
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Additional Comments: We are concerned about the noise level from larger jets.
The hundreds of Geese that flock to the small lakes in Charbonneau are a hazard to the jet engines.
Longer runways bring larger planes. Larger planes bring freight. Freight needs to be hauled away in big trucks - I-5 in the Wilsonville area and beyond is the most deadly in the State. We don't need more truck traffic and congestion.

Contact Information (optional):

Name: Susan DeFrancisco
Address: 32245 SW Arbor Lake Dr
Wilsonville, OR 97070
Phone: 503-694-2324
Email: slde@comcast.net

Thank you for taking the time to provide your input!

Please mail this form to:
Adrienne DeDona
1110 SE Alder Street, Suite 301
Portland, OR 97214
Or fax to: (503) 230-4877
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Additional Comments:

We hate to see an increase in the Airport - Already the Noise & Planes flying Low is very unpleasant. Quality of Living in A Somewhat Rural Area is suffering from All of This - Homes To The South would Really feel This with Runway Extensions

Contact Information (optional):

Name: Judy Ottinger

Address: 31092 Country View Ln
Wilsonville, Oregon

Phone:

Email:

Thank you for taking the time to provide your input!

Please mail this form to:
Adrienne DeDona
1110 SE Alder Street, Suite 301
Portland, OR 97214
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By

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The chart below includes features of the no build alternative and the three build alternatives. Please indicate what features of the alternatives you prefer by checking the appropriate box.

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Airport Reference Code	☐ No change. Remain at ARC B-II	■ No change. Remain at ARC B-II	☐ Upgrade to ARC C-II	☐ Upgrade to ARC C-II
Runway Length	☐ No change (total runway length: 5,004')	☐ 600' extension to north end of runway (total runway length: 5,604')	☐ 1,000' extension to south end of runway, closure of Keil Rd. (total runway length: 6,004')	■ No change to length. However, relocation of the parallel taxiway is necessary for precision approach. (total runway length: 5,004')
Runway Strength	☐ No change (45,000 pounds DWG)	☐ Strengthen to 60,000 pounds DWG	☐ Strengthen to 60,000 pounds DWG	■ No change (45,000 pounds DWG)
Air Traffic Control Tower (ATCT) Location	*Has not yet been determined. Please select your preferred location from Alternative 1, 2 or 3.*	■ ATCT located midfield on the east side.	☐ ATCT centrally located within State-owned property, but north of the location in Alternative 1.	☐ ATCT located closer to the north end and farther from the runway than in the other two build alternatives.

Helicopter Parking Location	☐ No change	☐ Designation of helicopter operations area in the northwest section of State-owned property.	☐ Designation of helicopter operations area, situated where the fuel tanks are currently located.	☐ Designation of helicopter operations area, north of the current apron.
Fuel Station Location	☐ No change	☐ Fuel tank relocation south of Aurora Aviation.	☐ Fuel tanks relocated northeast of Aurora Aviation.	■ Future fuel tanks located at the south end of State-owned property.
Aurora Rural Fire Protection District Location	☐ No change	■ Fire District's response building located near the air traffic control tower (ATCT).	☐ Fire District's response building located adjacent to the water suppression system.	■ The Fire District's response building located east of the fire suppression system.
Cargo Apron Location	☐ No change	☐ No change	☐ Designation of a cargo apron facility, north of Aurora Aviation.	■ The cargo apron centrally located on State-owned property.

Additional Comments:

SEE ATTACHED.

Contact Information (optional):

Name: JERRY TILLERY

Address: 7760 SW VILLAGE GREENS CIRCLE
WILSONVILLE, OR, 97070

Phone: 503 694 1071

Email: JERRYOTILLERY@AOL.COM

Thank you for taking the time to provide your input!

Please mail this form to:
Adrienne DeDona
1110 SE Alder Street, Suite 301
Portland, OR 97214
Or fax to: (503) 230-4877
You can also email comments to: Adrienne@jla.us.com

87 Cont.

AUORA STATE AIRPORT MASTER PLAN UPDATE
COMMENT FORM ADDENMUM

Additional Comments:

In as much as the Charbonneau is a heavily populated area at the southern most edge of the city of Wilsonville, every effort should be taken to not degrade the environmental and living conditions of the residents while improving or, at the very least, mitigating the physical risk to person and property. To that end, I recommend the following:

- Any fuel storage should be located as far to the southern end of the airport as possible. This provides, by physical distance, the maximum protection to the populace in the case of explosion.
- Approach capability should NOT be lowered below the current one statute mile minimum. North-to-south approaches typically pass over Charbonneau. Lowering the approach minimum directly increases the risk to the populace by reducing the vertical distance between the aircraft and the ground in case of an in-flight emergency such as mechanical failure, bird strikes, and/or wind shear. Further, the potential for increased air traffic coupled with lowering the approach minimum directly and dramatically degrades the quality of life around the airport by increasing the noise pollution associated the lower approaches.
- Strengthening the runway only serves to allow larger, louder aircraft to access the airport. This change will result in further increasing noise pollution and dramatically increases the risk of damage to property and person in the case of an aircraft crash.
- Helicopter operations should be located as far away form heavily populated areas as possible. This dislocation not only affords increased protection for the populace but also reduces the noise pollution associated with these aircraft types.

Aurora State Airport Master Plan Update

COMMENT FORM

The chart below includes features of the no build alternative and the three build alternatives. Please indicate what features of the alternatives you prefer by checking the appropriate box.

	No Build Alternative	Alternative 1	Alternative 2	Alternative 3
trument proach pability	☒ No change. Approach minima to remain at visual and greater than 1 statute mile (sm)	☐ No change. Approach minima to remain at visual and greater than 1 statute mile (sm)	☐ Improved instrument approach capability. Visibility greater than ¾ statute mile (sm)	☐ Improved instrument approach capability. Visibilit minima lower than ¾ statut mile (sm) (precision approaches). Parallel taxiway relocated 1(feet to the east and multiple buildings removed or alterec
port ference Code	☒ No change. Remain at ARC B-II	☐ No change. Remain at ARC B-II	☐ Upgrade to ARC C-II	☐ Upgrade to ARC C-II
nway Length	☒ No change (total runway length: 5,004')	☐ 600' extension to north end of runway (total runway length: 5,604')	☐ 1,000' extension to south end of runway, closure of Keil Rd. (total runway length: 6,004')	☐ No change to length. However, relocation of the parallel taxiway is necessary precision approach. (total runway length: 5,004')
nway ength	☒ No change (45,000 pounds DWG)	☐ Strengthen to 60,000 pounds DWG	☐ Strengthen to 60,000 pounds DWG	☐ No change (45,000 pour DWG)
Traffic ntrol Tower CT) Location	*Has not yet been determined. Please select your preferred location from Alternative 1, 2 or 3.*	☐ ATCT located midfield on the east side.	☐ ATCT centrally located within State-owned property, but north of the location in Alternative 1	☐ ATCT located closer to t north end and farther from tl runway than in the other twc build alternatives

	No Build Alternative	Alternative 1	Alternative 2	Alternative 3
licopter rking Location	☒ No change	☐ Designation of helicopter operations area in the northwest section of State-owned property.	☐ Designation of helicopter operations area, situated where the fuel tanks are currently located.	☐ Designation of helicopter operations area, north of the current apron.
el Station cation	☒ No change	☐ Fuel tank relocation south of Aurora Aviation.	☐ Fuel tanks relocated northeast of Aurora Aviation.	☐ Future fuel tanks located at the south end of State-owned property.
rora Rural Fire otection trict Location	☒ No change	☐ Fire District's response building located near the air traffic control tower (ATCT).	☐ Fire District's response building located adjacent to the water suppression system.	☐ The Fire District's response building located east of the fire suppression system.
rgo Apron cation	☒ No change	☐ No change	☐ Designation of a cargo apron facility, north of Aurora Aviation.	☐ The cargo apron centrally located on State-owned property.

dditional Comments:

We have lived here since 1977.
We know there will be change.
But we DO NOT want the
airport any larger or improved
from how it is now.
The current JETS are loud and at
times too low during landing.
The size of aircraft is getting too large
for this location. Deb Barnes

Contact Information (optional):

Name: Barnes family

Address: 14570 NE Mulligan Ct
Aurora OR 97002

Phone: 503 678-5880

Email: geemo_deb@hotmail.co

Thank you for taking the time to provide your input

Please mail this form to:
Adrienne DeDona
1110 SE Alder Street, Suite 301
Portland, OR 97214
Or fax to: (503) 230-4877
You can also email comments to: Adrienne@jla.us.com

88 cont

Adrienne DeDona

From: Deb Barnes [geemo_deb@hotmail.com]
Sent: Wednesday, March 23, 2011 3:19 PM
To: Adrienne DeDona
Subject: Aurora Airport
Attachments: scan0002.jpg; scan0003.jpg

My husband and I would like our opinion on the Aurora Airport known.

I have attached a copy of the survey for the airport. As you can see we have MARKED every box in the "NO Build Alternative" column.

We DO NOT want and improvements done to the Aurora Airport. We would like to see the larger jets go to another airport. The noise from the jets is extremely annoying, especially when the come screaming over the house late at night.

Thank you,
Deb and Bob Barnes
14570 NE Mulligan CT.
Aurora, OR 97002
503.678.5880

Aurora State Airport Master Plan Update
COMMENT FORM

The chart below includes features of the no build alternative and the three build alternatives. Please indicate what features of the alternatives you prefer by checking the appropriate box.

	No Build Alternative	Alternative 1	Alternative 2	Alternative 3
Instrument Approach Capability	☐ No change. Approach minima to remain at visual and greater than 1 statute mile (sm)	☐ No change. Approach minima to remain at visual and greater than 1 statute mile (sm)	☐ Improved instrument approach capability. Visibility greater than ¾ statute mile (sm)	☐ Improved instrument approach capability. Visibility minima lower than ¾ statute mile (sm) (precision approaches). Parallel taxiway relocated 100 feet to the east and multiple buildings removed or altered.
Airport Reference Code	☐ No change. Remain at ARC B-II	☐ No change. Remain at ARC B-II	☐ Upgrade to ARC C-II	☐ Upgrade to ARC C-II
Runway Length	☐ No change (total runway length: 5,004')	☐ 600' extension to north end of runway (total runway length: 5,604')	☐ 1,000' extension to south end of runway, closure of Keil Rd. (total runway length: 6,004')	☐ No change to length. However, relocation of the parallel taxiway is necessary for precision approach. (total runway length: 5,004')
Runway Strength	☐ No change (45,000 pounds DWG)	☐ Strengthen to 60,000 pounds DWG	☐ Strengthen to 60,000 pounds DWG	☐ No change (45,000 pounds DWG)
Air Traffic Control Tower (ATCT) Location	*Has not yet been determined. Please select your preferred location from Alternative 1, 2 or 3.*	☐ ATCT located midfield on the east side.	☐ ATCT centrally located within State-owned property, but north of the location in Alternative 1.	☐ ATCT located closer to the north end and farther from the runway than in the other two build alternatives.

	No Build Alternative	Alternative 1	Alternative 2	Alternative 3
Helicopter Parking Location	☐ No change South end only	☐ Designation of helicopter operations area in the northwest section of State-owned property.	☐ Designation of helicopter operations area, situated where the fuel tanks are currently located.	☐ Designation of helicopter operations area, north of the current apron.
Fuel Station Location	☐ No change	☐ Fuel tank relocation south of Aurora Aviation.	☐ Fuel tanks relocated northeast of Aurora Aviation.	☒ Future fuel tanks located at the south end of State-owned property.
Aurora Rural Fire Protection District Location	☒ No change	☐ Fire District's response building located near the air traffic control tower (ATCT).	☐ Fire District's response building located adjacent to the water suppression system.	☐ The Fire District's response building located east of the fire suppression system.
Cargo Apron Location	☐ No change	☒ No change	☐ Designation of a cargo apron facility, north of Aurora Aviation.	☐ The cargo apron centrally located on State-owned property.

Additional Comments:

SEE ATTACHED

Contact Information (optional):

Name: HARLAN REETZ

Address: 25109 NE PRAIRIE VIEW DRIVE
AURORA, OR 97002

Phone: 503-957-3083

Email: HARLANREETZ@LIVE.COM

Thank you for taking the time to provide your input!

Please mail this form to:
Adrienne DeDona
1110 SE Alder Street, Suite 301
Portland, OR 97214
Or fax to: (503) 230-4877
You can also email comments to: Adrienne@jla.us.com

From 1/14/11 to present there have been 127 flights at the intersection of Miley Road and Airport Road that are totally out of FAA compliance, according to the flight directory rules. This intersection is 1.6 miles from the airport.

1. Average flight inbound is 337 yards AGL (laser sighted)
2. All aircraft are flying in an illegal pattern
3. Noise abatement – Some cases rattle windows
4. Number of aircraft per month is 113 flights
5. Most critical-who at the state dept did the bird counts for possible bird strikes?
6. Four witnesses working on counting birds including AGL and direction of flight have been monitoring morning and night
7. Flocks of over 1,000+ to as few as 25 or 30 generally fly pattern at 020 degrees to 219 degrees. These are the biggest migration pattern for these birds. These birds are directly in the fly pattern of aircraft flying over the intersection of Miley Road and Airport Road.
8. The first engine out bird strike outbound is going to land in the middle of Wilsonville Shopping Center. It is a coincidence that average AGL for aircraft is 337 yards and geese are 215 to 480 yards AGL.

With these documentations and witnesses to what may happen in the event of a major accident, who exactly are we going to sue? All flight in and out of this airport should use the FAA directory per its rules and you will find it is pretty safe flying conditions.

Appendix L:
CIP COST ESTIMATES

Airport Master Plan Update

Aurora State Airport

WHPacific
OREGON DEPARTMENT OF AVIATION

Aurora State Airport CIP 2012 - 2032

#	Year	Description	Total Cost	ODA share	FAA Share	Private Share	Other Funding
Phase I (2012-2016)							
1	2012	Construct ATCT[1]	$ 3,369,000.00	$ 673,800.00	$ -	$ -	$ 2,695,200.00
2	2012	Service Road	$ 1,017,000.00	$ 50,850.00	$ 966,150.00	$ -	$ -
3	2013	PMP (2013)[2]	$ 27,000.00	$ 20,250.00	$ 6,750.00	$ -	$ -
4	2014	Helicopter Landing Pads	$ 11,000.00	$ 550.00	$ 10,450.00	$ -	$ -
5	2014	Ramp Reconstruction - State Leased	$ 988,000.00	$ 49,400.00	$ 938,600.00	$ -	$ -
6	2014	Taxilane Development (Hangar Access)	$ 43,000.00	$ -	$ -	$ 43,000.00	$ -
7	2015	Hangar Development	$ 2,088,000.00	$ -	$ -	$ 2,088,000.00	$ -
8	2015	Carryover Entitlements (ODA)	$ -	$ -	$ -	$ -	$ -
9	2016	Environmental Assessment (Runway Improvements)	$ 350,000.00	$ 17,500.00	$ 332,500.00	$ -	$ -
10	2016	PMP (2016)	$ 27,000.00	$ 20,250.00	$ 6,750.00	$ -	$ -
		Phase I Subtotal	*$ 7,920,000.00*	*$ 832,600.00*	*$ 2,261,200.00*	*$ 2,131,000.00*	*$ 2,695,200.00*
Phase II (2017-2021)[3]							
11	2017	Aurora RFPD Response Facility	$ 570,000.00	$ -	$ -	$ 570,000.00	$ -
12	2017	Carryover Entitlements (ODA - complete EA)	$ -	$ -	$ -	$ -	$ -
Disp Thres	13	2018	Property Acquisition (R17 Displaced Threshold)	$ 102,000.00	$ 5,100.00	$ 96,900.00	$ -	$ -
Disp Thres	14	2018	Avigation Easement Acquisition (R17 RPZ)	$ 44,000.00	$ 2,200.00	$ 41,800.00	$ -	$ -
Disp Thres	15	2019	Carryover Entitlements (In preparation of runway project)	$ -	$ -	$ -	$ -	$ -
Disp Thres	16	2020	Displaced Threshold (R17 - 800')	$ 1,980,000.00	$ 99,000.00	$ 1,881,000.00	$ -	$ -
Disp Thres	17	2020	Install Runway 17-35 PAPIs	$ 129,000.00	$ 6,450.00	$ 122,550.00	$ -	$ -
Disp Thres	18	2020	R17 Run-Up Area	$ 355,000.00	$ 17,750.00	$ 337,250.00	$ -	$ -
1000 Ext.	19	2018	Property Acquisition (R35 RPZ)	$ 2,561,000.00	$ 128,050.00	$ 2,432,950.00	$ -	$ -
1000 Ext.	20	2019	Keil Road Relocation	$ 1,427,000.00	$ 71,350.00	$ 1,355,650.00	$ -	$ -
1000 Ext.	21	2020	Runway Extension (R35 - 1000')	$ 3,035,000.00	$ 151,750.00	$ 2,883,250.00	$ -	$ -
1000 Ext.	22	2020	Install Runway 17 PAPIs	$ 65,000.00	$ 3,250.00	$ 61,750.00	$ -	$ -
	23	2019	PMP (2019)	$ 27,000.00	$ 20,250.00	$ 6,750.00	$ -	$ -
	24	2019	Taxilane Development (Hangar Access)	$ 43,000.00	$ -	$ -	$ 43,000.00	$ -
	25	2020	R17/35 Strengthening Overlay	$ 2,052,000.00	$ 102,600.00	$ 1,949,400.00	$ -	$ -
	26	2021	Hangar Development	$ 2,088,000.00	$ -	$ -	$ 2,088,000.00	$ -
	27	2021	Master Plan Update	$ 200,000.00	$ 10,000.00	$ 190,000.00	$ -	$ -
			Phase II Displaced Threshold Subtotal	*$ 7,590,000.00*	*$ 263,350.00*	*$ 4,625,650.00*	*$ 2,701,000.00*	*$ -*
			Phase II Runway Extension Subtotal	*$ 12,068,000.00*	*$ 487,250.00*	*$ 8,879,750.00*	*$ 2,701,000.00*	*$ -*
Phase III (2022-2031)							
	28		PMP (2022, 2025, 2028, 2031)	$ 108,000.00	$ 81,000.00	$ 27,000.00	$ -	$ -
	29		Apron Development	$ 1,638,000.00	$ 81,900.00	$ 1,556,100.00	$ -	$ -
	30		Taxilane Development (Hangar Access)	$ 43,000.00	$ -	$ -	$ 43,000.00	$ -
	31		Hangar Development	$ 2,088,000.00	$ -	$ -	$ 2,088,000.00	$ -
	32		Cargo Apron	$ 198,000.00	$ 9,900.00	$ 188,100.00	$ -	$ -
	33		Relocate Fuel Tanks	$ 89,000.00	$ 4,450.00	$ 84,550.00	$ -	$ -
	34		R17 Run-Up Area[4]	$ 355,000.00	$ 17,750.00	$ 337,250.00	$ -	$ -
			Phase III Subtotal	*$ 4,519,000.00*	*$ 195,000.00*	*$ 2,193,000.00*	*$ 2,131,000.00*	*$ -*
			Total Capital Costs with Displaced Threshold Option	**$ 20,029,000.00**	**$ 1,290,950.00**	**$ 9,079,850.00**	**$ 6,963,000.00**	**$ 2,695,200.00**
			Total Capital Costs with Runway Extension Option	**$ 24,507,000.00**	**$ 1,514,850.00**	**$ 13,333,950.00**	**$ 6,963,000.00**	**$ 2,695,200.00**

[1] *Other Funding is Connect Oregon III Grant*

[2] *ODA share for PMP is 75% of total cost*

[3] *Items 13-18 or Items 19-22 to be implemented, pending FAA determination*

[4] *If no displaced threshold project; construct R17 run-up at same time as fuel tank relocation project.*

Aurora State Airport
Proposed Capital Improvement Projects

	Project Description	Total Cost	Funding Source: ODA (5%)	FAA* (95%)	Private
A	Property Acquisition (Runway 17 Displaced Threshold)	$ 102,000	$ 5,100	$ 96,900	
B	Property Acquisition (Runway 35 RPZ)	$ 2,561,000	$ 128,050	$ 2,432,950	
C	Avigation Easement Acquisition (Runway 17 RPZ)	$ 44,000	$ 2,200	$ 41,800	
D	Displace Runway 17 Threshold (800')	$ 1,980,000	$ 99,000	$ 1,881,000	
E	Runway 35 Extention (1000')	$ 3,035,000	$ 151,750	$ 2,883,250	
F	Runway 17 Runnup	$ 355,000	$ 17,750	$ 337,250	
G	Keil Road Relocation	$ 1,427,000	$ 71,350	$ 1,355,650	
H	Apron Development	$ 1,638,000	$ 81,900	$ 1,556,100	
I	Aurora RFPD Response Facility	$ 570,000	$ -	$ -	$ 570,000
J	Cargo Apron	$ 198,000	$ 9,900	$ 188,100	
K	Construct ATCT	$ 3,369,000	$ 168,450	$ 3,200,550	
L	Taxilane Development (Hangar Access)	$ 43,000	$ 2,150	$ 40,850	
M	Hangar Development	$ 2,088,000	$ -	$ -	$ 2,088,000
N	Helicopter Landing Pads	$ 11,000	$ 550	$ 10,450	
O	Install Runway 17 PAPIs	$ 65,000	$ 3,250	$ 61,750	
P	ODA Pavement Maintenance Program 2013/2016	$ 27,000	$ 20,250	$ 6,750	
Q	Runway 17-35 Strengthening Overlay	$ 2,052,000	$ 102,600	$ 1,949,400	
R	Relocate Fuel Tank	$ 89,000	$ 44,500	$ -	$ 44,500
S	Service Road	$ 1,017,000	$ 50,850	$ 966,150	
	Total	**$ 20,671,000**	**$ 959,600**	**$ 17,008,900**	**$ 2,702,500**

* Eligibility for FAA funding does not insure that funds will be available or granted for the project.
- Total costs include construction, temporary flagging and signing, construction staking, testing, engineering, administration, and contingency, as applicable.

Aurora State Airport

1: 2012 Construct ATCT1

Assumptions:

Project includes construction of Air Traffic Control Tower. Estimate includes all site work and construction of the Tower building along with Engineering and Administration.

Cost Estimate:

Item Description	Qty	Unit	Price/Unit	Cost
ATCT	1	LS	$3,369,000	$3,369,000
Total Cost				$3,369,000
Total Rounded Cost				**$3,369,000**

Aurora State Airport

3: 2013 PMP (2013)2

Assumptions:

Project includes crack sealing, AC patching, and surface sealants at various locations on the Airport. Estimate was based on 2009 ODA PMP project cost for Aurora.

Cost Estimate:

Item Description	Qty	Unit	Price/Unit	Cost
Crack Sealing and AC Patching	1	LS	$10,000	$10,000
Surface Sealants	25000	SF	$0.25	$6,250
Subtotal Construction				$16,250
Mobilization	10.0%		$16,250	$1,625
Total Construction				**$17,875**

Engineering & Administration	30%		$17,875	$5,363
Contigency	20%		$17,875	$3,575
Total Cost				$26,813
Total Rounded Cost				**$27,000**

Aurora State Airport

4: 2014 Helicopter Landing Pads

Assumptions:

Project includes painting of 2 Helicopter Landing Pads near midfield.

Cost Estimate:

Item Description	Qty	Unit	Price/Unit	Cost
Subtotal Striping	500	SF	$10.00	$5,000
Subtotal Other Site Improvements	1	LS	$500	$500
Subtotal Construction				$5,500
Mob., Testing, Temp. Flagging, Surv & Mrkg	20%		$5,500	$1,100
Total Construction				**$6,600**

Engineering & Administration	40%		$6,600	$2,640
Contigency	15%		$6,600	$990
Total Cost				$10,230
Total Rounded Cost				**$11,000**

Aurora State Airport

6: 2014 Taxilane Development (Hangar Access)

Assumptions:

Project includes construction of Taxilanes on the east side of the parallel Taxiway near midfield to provide access to new hangar developments. Items included in the construction estimate are drainage improvements, site preparation, excavation, paving, striping, and seeding. Construction unit prices and soft cost percentages were estimated starting from ODA 2009 Unit Cost Estimate for Region 1.

Cost Estimate:

Item Description	Qty	Unit	Price/Unit	Cost
Subtotal Paving and Excavation	300	SY	$59.00	$17,700
Subtotal Other Site Improvements	1	LS	$9,000	$9,000
Subtotal Construction				$26,700
Mob., Testing, Temp. Flagging, Surv & Mrkg	15.0%		$26,700	$4,005
Total Construction				**$30,705**

Engineering & Administration	25%		$30,705	$7,676
Contigency	15%		$30,705	$4,606
Total Cost				$42,987
Total Rounded Cost				**$43,000**

5: 2014 Ramp Reconstruction - State Leased

Assumptions:

Project includes the re-construction of a state leased Apron Ramp on the east side of the parallel Taxiway, in front of the Aurora Aviation FBO. Items included in the construction estimate are drainage improvements, site preparation, excavation, paving, striping. Construction unit prices and soft cost percentages were estimated starting from ODA 2009 Unit Cost Estimate for Region 1.

Cost Estimate:

Item Description	Qty	Unit	Price/Unit	Cost
Subtotal Paving and Excavation	8888.889	SY	$60.00	$533,333
Subtotal Other Site Improvements	1	LS	$80,000	$80,000
Subtotal Construction				$613,333
Mob., Testing, Temp. Flagging, Surv & M	15.0%		$613,333	$92,000
Total Construction				**$705,333**

Engineering & Administration	25%		$705,333	$176,333
Contigency	15%		$705,333	$105,800
Total Cost				$987,467
Total Rounded Cost				**$988,000**

Aurora State Airport

7: 2015 Hangar Development

Assumptions:

Project includes construction of approximately 10 Hangars totaling 44,000 square feet. Estimate includes all site work and construction of the Hangars. Project was estimated to be broken out in 3 phases.

Cost Estimate:

Item Description	Qty	Unit	Price/Unit	Cost
Aircraft Hangars	14667	SF	$75	$1,100,000
Site Work	1	LS	$110,000	$110,000
Subtotal Construction				$1,210,000
Mob., Testing, Temp. Flagging, Surv & Mrkg	15.0%		$1,210,000	$181,500
Total Construction				**$1,391,500**

Engineering & Administration	30%		$1,391,500	$417,450
Contigency	20%		$1,391,500	$278,300
Total Cost				$2,087,250
Total Rounded Cost				**$2,088,000**

Aurora State Airport

9: 2016 Environmental Assessment (Runway Improvements)

Assumptions:

Project includes Environmental Assessment for Runway 17-35 Improvements.

Cost Estimate:

Item Description	Qty	Unit	Price/Unit	Cost
Runway Improvement EA	1	LS	$350,000	$350,000
Total Cost				$350,000
Total Rounded Cost				**$350,000**

Aurora State Airport

10: 2016 PMP (2016)

Assumptions:

Project includes crack sealing, AC patching, and surface sealants at various locations on the Airport. Estimate was based on 2009 ODA PMP project cost for Aurora.

Cost Estimate:

Item Description	Qty	Unit	Price/Unit	Cost
Crack Sealing and AC Patching	1	LS	$10,000	$10,000
Surface Sealants	25000	SF	$0.25	$6,250
Subtotal Construction				$16,250
Mobilization	10.0%		$16,250	$1,625
Total Construction				**$17,875**

Engineering & Administration	30%		$17,875	$5,363
Contigency	20%		$17,875	$3,575
Total Cost				$26,813
Total Rounded Cost				**$27,000**

Aurora State Airport

11: 2017 Aurora RFPD Response Facility

Assumptions:

Project includes construction of a RFPD Response Facility of approximately 2,000 square feet. Estimate includes all site work and construction of the Hangars.

Cost Estimate:

Item Description	Qty	Unit	Price/Unit	Cost
Aircraft Hangars	2000	SF	$150	$300,000
Site Work	1	LS	$30,000	$30,000
Subtotal Construction				$330,000
Mob., Testing, Temp. Flagging, Surv & Mrkg	15.0%		$330,000	$49,500
Total Construction				**$379,500**

Engineering & Administration	30%		$379,500	$113,850
Contigency	20%		$379,500	$75,900
Total Cost				$569,250
Total Rounded Cost				**$570,000**

Aurora State Airport

13: 2018 Property Acquisition (R17 Displaced Threshold)

Assumptions:

OFA Property Acquisition for Runway 17 Displaced Threshold includes costs of purchasing land and negotiations.

Cost Estimate:

Item Description	Qty	Unit	Price/Unit	Cost
Land Acquisition	2.2	ACRE	$25,000.00	$55,000
Property Negotiations	3	EA	$10,000	$30,000
Subtotal				**$85,000**

Engineering & Administration	5%		$85,000	$4,250
Contigency	15%		$85,000	$12,750
Total Cost				$102,000
Total Rounded Cost				**$102,000**

Aurora State Airport

14: 2018 Avigation Easement Acquisition (R17 RPZ)

Assumptions:

Avigation Easement for Runway 17 Displaced Threshold includes negotiation costs and per acre costs.

Cost Estimate:

Item Description	Qty	Unit	Price/Unit	Cost
Avigation Easement	2.6	ACRE	$10,000	$26,000
Property Negotiations	1	EA	$10,000	$10,000
Subtotal				**$36,000**

Engineering & Administration	5%		$36,000	$1,800
Contigency	15%		$36,000	$5,400
Total Cost				$43,200
Total Rounded Cost				**$44,000**

Aurora State Airport

16: 2020 Displaced Threshold (R17 - 800')

Assumptions:

Project includes construction of 800 lineal feet of runway to displace Runway 17 along with 800 lineal feet of parallel Taxiway A east of the runway on the north end. Items included in the construction estimate include drainage improvements, site preparation, excavation, paving, striping, lighting, signage, and seeding. Construction unit prices and soft cost percentages were estimated starting from ODA 2009 Unit Cost Estimate for Region 1.

Cost Estimate:

Item Description	Qty	Unit	Price/Unit	Cost
Subtotal Paving Section and Excavation	15126	SY	$59.00	$892,424
Runway Grooving	8889	SY	$2.00	$17,778
Runway Lighting per Length Runway	800	LF	$56.00	$44,800
Runway Striping per Length Runway	800	LF	$6.40	$5,120
Taxiway Lighting per Length Taxiway	1050	LF	$112.00	$117,600
Subtotal Other Site Improvements	1	LS	$151,712	$151,712
Subtotal Construction				$1,229,434
Mob., Testing, Temp. Flagging, Surv & Mrkg	15.0%		$1,229,434	$184,415
Total Construction				**$1,413,849**

Engineering & Administration	25%		$1,413,849	$353,462
Contigency	15%		$1,413,849	$212,077
Total Cost				$1,979,389
Total Rounded Cost				**$1,980,000**

Aurora State Airport

17: 2020 Install Runway 17-35 PAPIs

Assumptions:

Project includes installation of a new PAPI navaid systems for Runway 17-35. Construction unit prices and soft cost percentages were estimated starting from ODA 2009 Unit Cost Estimate for Region 1.

Cost Estimate:

Item Description	Qty	Unit	Price/Unit	Cost
Runway 17 PAPI	1	LS	$40,000	$40,000
Runway 35 PAPI	1	LS	$40,000	$40,000
Subtotal Construction				$80,000
Mob., Testing, Temp. Flagging, Surv & Mrkg	15.0%		$80,000	$12,000
Total Construction				**$92,000**

Engineering & Administration	25%		$92,000	$23,000
Contigency	15%		$92,000	$13,800
Total Cost				$128,800
Total Rounded Cost				**$129,000**

Aurora State Airport

18: 2020 R17 Run-Up Area

Assumptions:

Project includes construction of a Runnup Apron on the east side of the parallel Taxiway for Runway 17. Items included in the construction estimate are drainage improvements, site preparation, excavation, paving, striping, taxiway lighting and seeding. Construction unit prices and soft cost percentages were estimated starting from ODA 2009 Unit Cost Estimate for Region 1.

Cost Estimate:

Item Description	Qty	Unit	Price/Unit	Cost
Subtotal Paving and Excavation	2585	SY	$59.00	$152,541
Subtotal Other Site Improvements	1	LS	$23,000	$23,000
Taxiway Lighting per Length Runway	400	LF	$112.00	$44,800
Subtotal Construction				$220,341
Mob., Testing, Temp. Flagging, Surv & Mrkg	15.0%		$220,341	$33,051
Total Construction				**$253,392**

Engineering & Administration	25%		$253,392	$63,348
Contigency	15%		$253,392	$38,009
Total Cost				$354,749
Total Rounded Cost				**$355,000**

Aurora State Airport

19: 2018 Property Acquisition (R35 RPZ)

Assumptions:

Property Acquisition within the RPZ of the extended Runway 35. Costs include cost per acre of purchasing real property and negotiations required.

Cost Estimate:

Item Description	Qty	Unit	Price/Unit	Cost
Property with Residence (14018 NE Keil Rd)	1	EA	$240,000.00	$240,000.00
Property with Residence (21860 NE Boones Ferry Rd)	1	EA	$275,000.00	$275,000.00
Property with Residence (21830 NE Boones Ferry RD)	1	EA	$130,000.00	$130,000.00
Property with Residence (21810 NE Boones Ferry RD)	1	EA	$150,000.00	$150,000.00
Relocation Assistance	4	EA	$50,000.00	$200,000.00
Land Acquisition	44.46	ACRE	$25,000.00	$1,111,500
Property Negotiations	12	EA	$10,000	$120,000
Subtotal				**$2,226,500**

Engineering & Administration	5%		$2,226,500	$111,325
Contigency	10%		$2,226,500	$222,650
Total Cost				$2,560,475
Total Rounded Cost				**$2,561,000**

Aurora State Airport

20: 2019 Keil Road Relocation

Assumptions:

Project includes relocating Keil Road where it enters the extended Runway 35 OFA and RPZ. Items included in the construction estimate are Right of Way (ROW) acquisition, drainage improvements, site preparation, excavation, paving, striping, and seeding. Construction unit prices and soft cost percentages were estimated starting from ODA 2009 Unit Cost Estimate for Region 1.

Cost Estimate:

Item Description	Qty	Unit	Price/Unit	Cost
Subtotal Paving and Excavation	11333	SY	$55	$623,333
ROW Acquisition	3.9	ACRE	$20,000	$78,000
ROW Negotiations	6	EA	$10,000	$60,000
Subtotal Other Site Improvements	1	LS	$125,000	$125,000
Subtotal Construction				$886,333
Mob., Testing, Temp. Flagging, Surv & Mrkg	15.0%		$886,333	$132,950
Total Construction				**$1,019,283**

Engineering & Administration	25%		$1,019,283	$254,821
Contigency	15%		$1,019,283	$152,893
Total Cost				$1,426,997
Total Rounded Cost				**$1,427,000**

Aurora State Airport

21: 2020 Runway Extension (R35 - 1000')

Assumptions:

Project includes construction of 1000 lineal feet of runway to extend Runway 35 along with 1000 lineal feet of parallel Taxiway east of the runway on the south end. Items included in the construction estimate include drainage improvements, site preparation, excavation, paving, striping, lighting, signage, navaid improvements, and seeding. Construction unit prices and soft cost percentages were estimated starting from ODA 2009 Unit Cost Estimate for Region 1.

Cost Estimate:

Item Description	Qty	Unit	Price/Unit	Cost
Subtotal Paving Section and Excavation	18148	SY	$59.00	$1,070,706
Runway Grooving	11111	SY	$2.00	$22,222
Runway Lighting per Length Runway	6000	LF	$56.00	$336,000
Runway Striping per Length Runway	6000	LF	$6.40	$38,400
Taxiway Lighting per Length Runway	1300	LF	$112.00	$145,600
Subtotal Other Site Improvements	1	LS	$182,000	$182,000
Runway 35 PAPI	1	LS	$40,000	$40,000
Runway 35 Relocate Localizer	1	LS	$50,000	$50,000
Subtotal Construction				$1,884,928
Mob., Testing, Temp. Flagging, Surv & Mrkg	15.0%		$1,884,928	$282,739
Total Construction				**$2,167,668**

Engineering & Administration	25%		$2,167,668	$541,917
Contigency	15%		$2,167,668	$325,150
Total Cost				$3,034,735
Total Rounded Cost				**$3,035,000**

Aurora State Airport

22: 2020 Install Runway 17 PAPIs

Assumptions:

Project includes installation of a new PAPI navaid system for Runway 17. Construction unit prices and soft cost percentages were estimated starting from ODA 2009 Unit Cost Estimate for Region 1.

Cost Estimate:

Item Description	Qty	Unit	Price/Unit	Cost
Runway 17 PAPI	1	LS	$40,000	$40,000
Subtotal Construction				$40,000
Mob., Testing, Temp. Flagging, Surv & Mrkg	15.0%		$40,000	$6,000
Total Construction				**$46,000**

Engineering & Administration	25%		$46,000	$11,500
Contigency	15%		$46,000	$6,900
Total Cost				$64,400
Total Rounded Cost				**$65,000**

Aurora State Airport

23: 2019 PMP (2019)

Assumptions:

Project includes crack sealing, AC patching, and surface sealants at various locations on the Airport. Estimate was based on 2009 ODA PMP project cost for Aurora.

Cost Estimate:

Item Description	Qty	Unit	Price/Unit	Cost
Crack Sealing and AC Patching	1	LS	$10,000	$10,000
Surface Sealants	25000	SF	$0.25	$6,250
Subtotal Construction				$16,250
Mobilization	10.0%		$16,250	$1,625
Total Construction				**$17,875**

Engineering & Administration	30%		$17,875	$5,363
Contigency	20%		$17,875	$3,575
Total Cost				$26,813
Total Rounded Cost				**$27,000**

Aurora State Airport

24: 2019 Taxilane Development (Hangar Access)

Assumptions:

Project includes construction of Taxilanes on the east side of the parallel Taxiway near midfield to provide access to new hangar developments. Items included in the construction estimate are drainage improvements, site preparation, excavation, paving, striping, and seeding. Construction unit prices and soft cost percentages were estimated starting from ODA 2009 Unit Cost Estimate for Region 1.

Cost Estimate:

Item Description	Qty	Unit	Price/Unit	Cost
Subtotal Paving and Excavation	300	SY	$59.00	$17,700
Subtotal Other Site Improvements	1	LS	$9,000	$9,000
Subtotal Construction				$26,700
Mob., Testing, Temp. Flagging, Surv & Mrkg	15.0%		$26,700	$4,005
Total Construction				**$30,705**

Engineering & Administration	25%		$30,705	$7,676
Contigency	15%		$30,705	$4,606
Total Cost				$42,987
Total Rounded Cost				**$43,000**

Aurora State Airport

25: 2020 R17/35 Strengthening Overlay

Assumptions:

Project includes a strength overlay of Runway 16-34 which will include a 1/2" Grind and 3" Overlay along with 2.5" transitions to Connector taxiways. Construction unit prices and soft cost percentages were estimated starting from ODA 2009 Unit Cost Estimate for Region 1 along with Bid results from Grants Pass Runway Rehab project.

Cost Estimate:

Item Description	Qty	Unit	Price/Unit	Cost
Asphalt 1/2" Grinding	69067	SY	$2.00	$138,133
Subtotal Paving	69067	SY	$14.00	$966,933
Runway Grooving	66667	SY	$2.00	$133,333
Runway Striping per Length Runway	6000	LF	$6.40	$38,400
Subtotal Other Site Improvements	1	LS	$2,763	$2,763
Subtotal Construction				$1,279,563
Mob., Testing, Temp. Flagging, Surv & Mrkg	14.5%		$1,279,563	$185,537
Total Construction				**$1,465,099**

Engineering & Administration	25%		$1,465,099	$366,275
Contigency	15%		$1,465,099	$219,765
Total Cost				$2,051,139
Total Rounded Cost				**$2,052,000**

Aurora State Airport

27: 2021 Master Plan Update

Assumptions:

Project includes Master Plan update for Aurora State Airport

Cost Estimate:

Item Description	Qty	Unit	Price/Unit	Cost
Runway Improvement EA	1	LS	$200,000	$200,000
Total Cost				$200,000
Total Rounded Cost				**$200,000**

Aurora State Airport

26: 2021 Hangar Development

Assumptions:

Project includes construction of approximately 10 Hangars totaling 44,000 square feet. Estimate includes all site work and construction of the Hangars. Project was estimated to be broken out in 3 phases.

Cost Estimate:

Item Description	Qty	Unit	Price/Unit	Cost
Aircraft Hangars	14667	SF	$75	$1,100,000
Site Work	1	LS	$110,000	$110,000
Subtotal Construction				$1,210,000
Mob., Testing, Temp. Flagging, Surv & Mrkg	15.0%		$1,210,000	$181,500
Total Construction				**$1,391,500**

Engineering & Administration	30%		$1,391,500	$417,450
Contigency	20%		$1,391,500	$278,300
Total Cost				$2,087,250
Total Rounded Cost				**$2,088,000**

Aurora State Airport

28: PMP (2022, 2025, 2028, 2031)

Assumptions:

Project includes crack sealing, AC patching, and surface sealants at various locations on the Airport. Estimate was based on 2009 ODA PMP project cost for Aurora multiplied by 4 for each 2022, 2025, 2028, and 2031.

Cost Estimate:

Item Description	Qty	Unit	Price/Unit	Cost
Crack Sealing and AC Patching	1	LS	$10,000	$10,000
Surface Sealants	25000	SF	$0.25	$6,250
Subtotal Construction				$16,250
Mobilization	10.0%		$16,250	$1,625
Total Construction				**$17,875**

Engineering & Administration	30%		$17,875	$5,363
Contigency	20%		$17,875	$3,575
Subtotal Cost Per year				$26,813
Total Rounded Cost				**$108,000**

Aurora State Airport

2: 2012 Service Road

Assumptions:

Project includes construction a service road through the airport. Estimate includes easement acquisition, drainage improvements, site preparation, excavation, paving, striping, and seeding. Construction unit prices and soft cost percentages were estimated starting from ODA 2009 Unit Cost Estimate for Region 1.

Cost Estimate:

Item Description	Qty	Unit	Price/Unit	Cost
Subtotal Paving and Excavation	8400	SY	$55	$461,982
Easement Acquisitions	4	EA	$20,000	$80,000
Subtotal Other Site Improvements	1	LS	$92,000	$92,000
Subtotal Construction				$633,982
Mob., Testing, Temp. Flagging, Surv & Mrkg	14.5%		$633,982	$91,927
Total Construction				**$725,909**

Engineering & Administration	25%		$725,909	$181,477
Contigency	15%		$725,909	$108,886
Total Cost				$1,016,273
Total Rounded Cost				**$1,017,000**

Aurora State Airport

29: Apron Development

Assumptions:

Project includes construction of Aircraft Parking Aprons on the east side of the parallel Taxiway near midfield. Items included in the construction estimate are drainage improvements, site preparation, excavation, paving, striping, and seeding. Construction unit prices and soft cost percentages were estimated starting from ODA 2009 Unit Cost Estimate for Region 1.

Cost Estimate:

Item Description	Qty	Unit	Price/Unit	Cost
Subtotal Paving and Excavation	15676	SY	$59.00	$924,875
Subtotal Other Site Improvements	1	LS	$92,000	$92,000
Subtotal Construction				$1,016,875
Mob., Testing, Temp. Flagging, Surv & Mrkg	15%		$1,016,875	$152,531
Total Construction				**$1,169,407**

Engineering & Administration	25%		$1,169,407	$292,352
Contigency	15%		$1,169,407	$175,411
Total Cost				$1,637,170
Total Rounded Cost				**$1,638,000**

Aurora State Airport

30: Taxilane Development (Hangar Access)

Assumptions:

Project includes construction of Taxilanes on the east side of the parallel Taxiway near midfield to provide access to new hangar developments. Items included in the construction estimate are drainage improvements, site preparation, excavation, paving, striping, and seeding. Construction unit prices and soft cost percentages were estimated starting from ODA 2009 Unit Cost Estimate for Region 1.

Cost Estimate:

Item Description	Qty	Unit	Price/Unit	Cost
Subtotal Paving and Excavation	300	SY	$59.00	$17,700
Subtotal Other Site Improvements	1	LS	$9,000	$9,000
Subtotal Construction				$26,700
Mob., Testing, Temp. Flagging, Surv & Mrkg	15.0%		$26,700	$4,005
Total Construction				**$30,705**

Engineering & Administration	25%		$30,705	$7,676
Contigency	15%		$30,705	$4,606
Total Cost				$42,987
Total Rounded Cost				**$43,000**

Aurora State Airport

31: Hangar Development

Assumptions:

Project includes construction of approximately 10 Hangars totaling 44,000 square feet. Estimate includes all site work and construction of the Hangars. Project was estimated to be broken out in 3 phases.

Cost Estimate:

Item Description	Qty	Unit	Price/Unit	Cost
Aircraft Hangars	14667	SF	$75	$1,100,000
Site Work	1	LS	$110,000	$110,000
Subtotal Construction				$1,210,000
Mob., Testing, Temp. Flagging, Surv & Mrkg	15.0%		$1,210,000	$181,500
Total Construction				**$1,391,500**

Engineering & Administration	30%		$1,391,500	$417,450
Contigency	20%		$1,391,500	$278,300
Total Cost				$2,087,250
Total Rounded Cost				**$2,088,000**

Aurora State Airport

32: Cargo Apron

Assumptions:

Project includes construction of a Cargo Apron on the east side of the parallel Taxiway near midfield. Items included in the construction estimate are drainage improvements, site preparation, excavation, paving, striping, and seeding. Construction unit prices and soft cost percentages were estimated starting from ODA 2009 Unit Cost Estimate for Region 1.

Cost Estimate:

Item Description	Qty	Unit	Price/Unit	Cost
Subtotal Paving and Excavation	1889	SY	$59.00	$111,444
Subtotal Other Site Improvements	1	LS	$11,000	$11,000
Subtotal Construction				$122,444
Mob., Testing, Temp. Flagging, Surv & Mrkg	15.0%		$122,444	$18,367
Total Construction				**$140,811**

Engineering & Administration	25%		$140,811	$35,203
Contigency	15%		$140,811	$21,122
Total Cost				$197,136
Total Rounded Cost				**$198,000**

Aurora State Airport

33: Relocate Fuel Tanks

Assumptions:

Project includes relocating fuel storage. Estimate includes new pavement approximately 50'x75' and relocating the tanks.

Cost Estimate:

Item Description	Qty	Unit	Price/Unit	Cost
Subtotal Paving new Fuel Storage pad	416.7	SY	$55.00	$22,917
Relocate Fuel Storage Tank	1	LS	$30,000.00	$30,000
Subtotal Other Site Improvements	1	LS	$2,292	$2,292
Subtotal Construction				$55,208
Mob., Testing, Temp. Flagging, Surv & Mrkg	14.5%		$55,208	$8,005
Total Construction				**$63,214**

Engineering & Administration	25%		$63,214	$15,803
Contigency	15%		$63,214	$9,482
Total Cost				$88,499
Total Rounded Cost				**$89,000**

Aurora State Airport

34: R17 Run-Up Area4

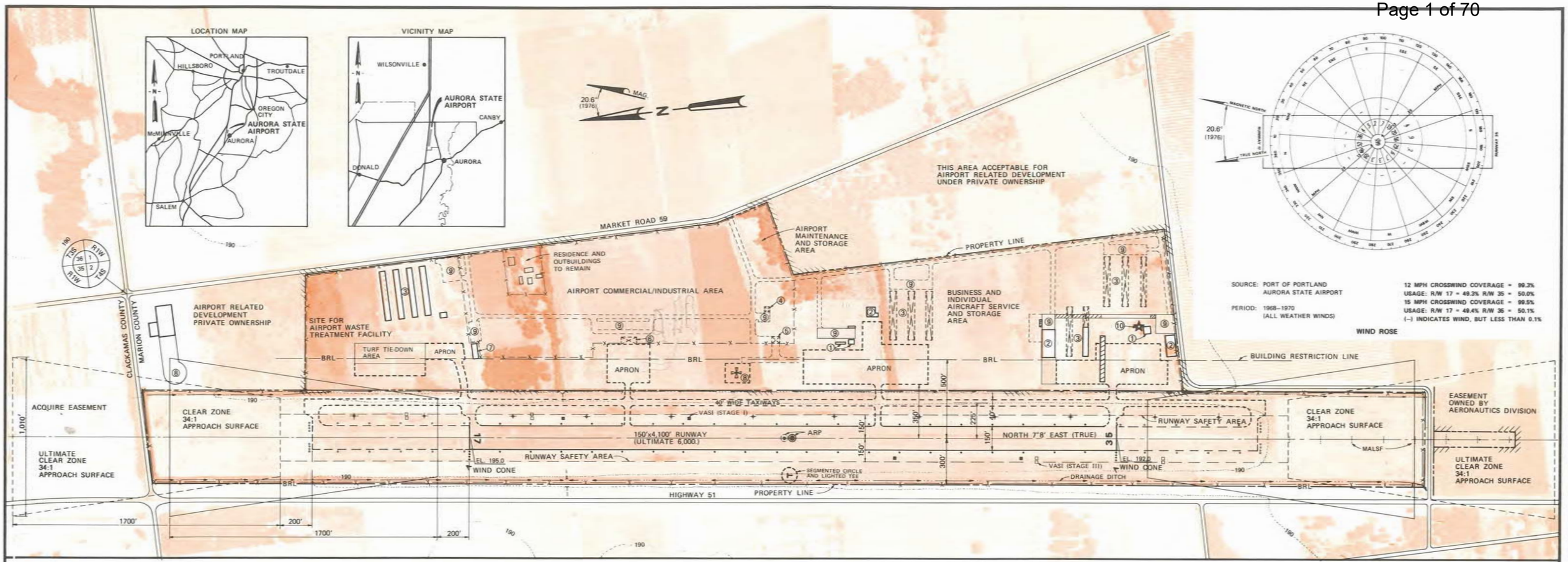
Assumptions:

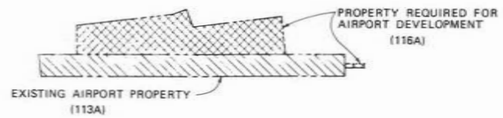
Project includes construction of a Runnup Apron on the east side of the parallel Taxiway for Runway 17. Items included in the construction estimate are drainage improvements, site preparation, excavation, paving, striping, taxiway lighting and seeding. Construction unit prices and soft cost percentages were estimated starting from ODA 2009 Unit Cost Estimate for Region 1.

Cost Estimate:

Item Description	Qty	Unit	Price/Unit	Cost
Subtotal Paving and Excavation	2585	SY	$59.00	$152,541
Subtotal Other Site Improvements	1	LS	$23,000	$23,000
Taxiway Lighting per Length Runway	400	LF	$112.00	$44,800
Subtotal Construction				$220,341
Mob., Testing, Temp. Flagging, Surv & Mrkg	15.0%		$220,341	$33,051
Total Construction				**$253,392**

Engineering & Administration	25%		$253,392	$63,348
Contigency	15%		$253,392	$38,009
Total Cost				$354,749
Total Rounded Cost				**$355,000**





ULTIMATE AIRPORT PROPERTY

300 0 300 600
SCALE IN FEET

FACILITIES	
NO.	
1	F.B.O. OFFICE
2	F.B.O. HANGAR
3	TEE-HANGAR
4	CONTROL TOWER
5	CRASH, FIRE, RESCUE BLDG.
6	ADMIN./TERMINAL BUILDING
7	AVIONICS SHOP
8	HELIPORT
9	AUTOMOBILE PARKING
10	AIRPORT BEACON

NOTES:

1. FOR ADDITIONAL INFORMATION CONCERNING THE TERMINAL AREA SEE TERMINAL AREA PLAN.
2. FOR ADDITIONAL INFORMATION CONCERNING APPROACH SLOPES, CLEAR ZONES AND OBSTRUCTION SURFACES SEE ULTIMATE AIRPORT IMAGINARY SURFACES PLAN.
3. AFTER MLS STANDARDS HAVE BEEN ESTABLISHED, THE DIMENSIONS FOR RUNWAY WIDTH AND FOR APPROACH SURFACES MAY BE REVISED.
4. THE LOCATION OF THE MALSF IS SUBJECT TO CHANGE DEPENDING ON AN IFR WIND ANALYSIS.

BASIC DATA TABLE				
RUNWAY DATA				
	EXISTING (1975)	STAGE I (1975-1980)	STAGE II (1980-1985)	STAGE III (1985-1995)
RUNWAY LENGTH	4,100' 1,250m	4,100' 1,250m	5,000' 1,524m	6,000' 1,829m
RUNWAY WIDTH	150' 46m	150' 46m	150' 46m	150' 46m
EFFECTIVE GRADIENT (%)	0.07	0.07	0.07	0.06
PERCENT WIND COVERAGE	99.5	99.5	99.5	99.5
INSTRUMENT RUNWAY	None	None	None	None
PAVEMENT STRENGTH*	30S	30S	30S	60D
FAR PART 77 CATEGORY	B/C	B/C	B/C	B/C
FAR PART 77 APPROACH SLOPES	34:1	34:1	34:1	34:1
ACTUAL CLEAR APPROACH SLOPES	N26:1 S36:1	34:1	34:1	34:1
LIGHTING	L. Intensity	M. Intensity	M. Intensity	M. Intensity
MARKING	Basic	Non-Precision	Non-Precision	Non-Precision
NAVIGATIONAL AIDS	None	VASI	MALSF	MLS
OPERATIONAL ROLE	GU	GU	BT	BT

*Values given are the gross weight in 1,000 lbs. for single (S) and dual (D) gear aircraft.

BASIC DATA TABLE		
AIRPORT DATA		
	EXISTING	ULTIMATE
AIRPORT ELEVATION (MSL)	195'	195'
AIRPORT REFERENCE POINT (ARP) LAT.	45° 14' 43"	45° 14' 44"
LNG.	122° 46' 07"	122° 46' 07"
NAVIGATIONAL AIDS	NONE	MLS
NORMAL MAX. TEMP. HOTTEST MONTH	84°F (29°C)	84°F (29°C)
FUNCTIONAL ROLE	S3	S2
MISCELLANEOUS FACILITIES: TAXIWAY MARKING AND LIGHTING	NONE	BASIC

KEY TO ABBREVIATIONS

B/C Non-precision Instrument Runway Larger Than Utility
GU General Utility
BT Basic Transport
S3 Low Density Secondary System
S2 Medium Density Secondary System

LEGEND		
EXISTING	ULTIMATE	
190		GROUND CONTOURS
		PROPERTY LINE
	+	STORM DRAIN INLET
* * *	* * *	RUNWAY LIGHTS
****	**** ****	THRESHOLD LIGHTS
		FACILITIES
◉	◉	AIRPORT REFERENCE POINT
		BUILDING RESTRICTION LINE (BRL)
		BUILDINGS
		FACILITIES TO BE REMOVED
		DRAINAGE COURSE
		DRAINAGE CULVERT
x x x	x x x	FENCE

FEDERAL AVIATION ADMINISTRATION APPROVAL

Approval Date 11 JUNE 1976

See Approval Letter 11 JUNE 1976 Date

GEORGE L. BULEY
Chief, Airports Planning Branch

AERONAUTICS DIVISION APPROVAL

ROY M. RAASINA 13 MAY 1976
Manager Airport Branch

PAUL E. BURKET 13 MAY 1976
Administrator

CH2M HILL

Drawn CRS
Check RDL
Appr. MRM

FIGURE 23

No.	Revision	By	Appr.	Date

AURORA STATE AIRPORT
AURORA, OREGON

AIRPORT LAYOUT PLAN

OREGON STATE AERONAUTICS DIVISION
SALEM, OREGON

Township 4s Range 1w Scale as Shown Dwg. No. B-71 MP
Section 2,11 County MARION Date 13 MAY 76 Sheet 1 of 3

FACILITIES	
NO.	
1	F.B.O. OFFICE
2	F.B.O. HANGAR
3	TEE-HANGAR
4	CONTROL TOWER
5	CRASH, FIRE, RESCUE BLDG.
6	ADMIN./TERMINAL BUILDING
7	AVIONICS SHOP
8	HELIPORT
9	AUTOMOBILE PARKING
10	AIRPORT BEACON

MASTER PLAN FORECASTS FOR AURORA STATE AIRPORT				
	1975	1980	1985	1995
BASED AIRCRAFT	127	154	184	248
ANNUAL OPERATIONS	90,000	112,000	140,000	209,000
BUSY HOUR OPERATIONS	50	60	78	115
OPERATIONS PER BASED AIRCARFT	709	727	761	843

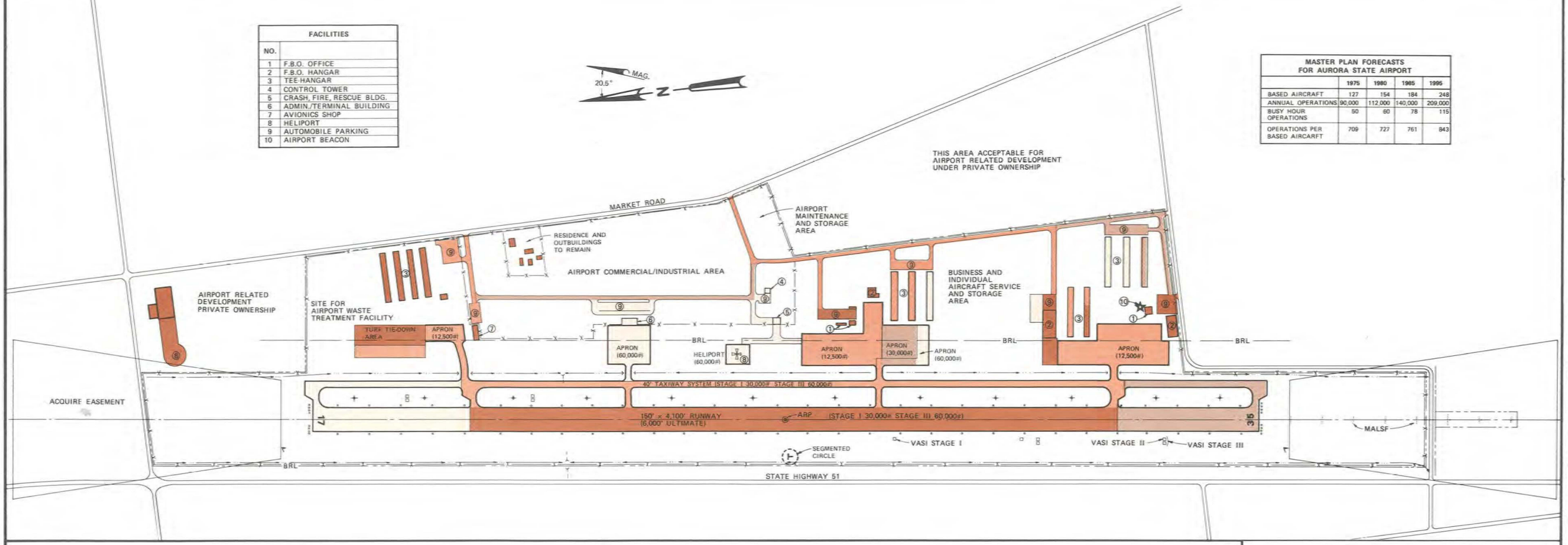


TABLE 10

DEVELOPMENT SCHEDULE

STAGE I — 1975-1980

PROJECT DESCRIPTION	QUANTITY
ACQUIRE LAND FOR AIRPORT DEVELOPMENT	116 ACRES
ACQUIRE AIR EASEMENTS	18 ACRES
REMOVE OBSTRUCTIONS	1.5 ACRES
PAVE AND MARK PARALLEL TAXIWAY SYSTEM (30,000#)	5,100 L.F.
PAVE AND MARK HOLDING APRONS (30,000#)	10,000 S.F.
PAVE AND MARK PARKING APRONS (12,500#)	305,000 S.F.
CONSTRUCT TURF PARKING AREA	10 AIRCRAFT
INSTALL ROTATING BEACON AND TOWER	1 EACH
INSTALL LIGHTED WIND TEE AND SEGMENTED CIRCLE	1 EACH
STRENGTHEN RUNWAY (TO 30,000#)	4,100 L.F.
INSTALL NON-PRECISION RUNWAY MARKING	4,100 L.F.
INSTALL MEDIUM INTENSITY RUNWAY LIGHTS	4,100 L.F.
INSTALL VASI SYSTEM	2 ENDS
INSTALL NON-DIRECTIONAL BEACON	1 EACH
INSTALL TAXIWAY REFLECTORS	5,100 L.F.
PAVE AND MARK AIRPORT ROADWAYS	3,600 L.F.
PAVE AND MARK AUTOMOBILE PARKING FACILITIES	80 AUTOS
CONSTRUCT FENCING	6,000 L.F.
CONSTRUCT TEE-HANGARS (PRIVATE DEVELOPMENT)	34 AIRCRAFT

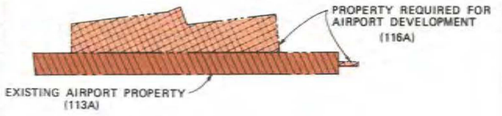
STAGE II - 1980-1985

PROJECT DESCRIPTION	QUANTITY
EXTEND, PAVE AND MARK RUNWAY (30,000#)	900 L.F.
EXTEND MEDIUM INTENSITY RUNWAY LIGHTS	900 L.F.
EXTEND, PAVE AND MARK TAXIWAY SYSTEM (30,000#)	1,000 L.F.
PAVE AND MARK HOLDING APRON (30,000#)	5,000 S.F.
REPOSITION VASI SYSTEM	1 END
INSTALL MEDIUM INTENSITY EXIT TAXIWAY LIGHTS	700 L.F.
INSTALL LIGHTED WIND CONES	2 EACH
PAVE AND MARK PARKING APRON (30,000#)	56,000 S.F.
INSTALL MALSF APPROACH LIGHT SYSTEM	1 END
INSTALL PARKING APRON LIGHTING	600 L.F.
PAVE AND MARK AIRPORT ROADWAYS	3,200 L.F.
PAVE AND MARK AUTOMOBILE PARKING FACILITIES	30 AUTOS
EXTEND FENCING	3,400 L.F.
CONSTRUCT TEE-HANGARS (PRIVATE DEVELOPMENT)	10 AIRCRAFT

STAGE III — 1985-1995

PROJECT DESCRIPTION	QUANTITY
EXTEND, PAVE AND MARK RUNWAY (60,000#)	1,000 L.F.
STRENGTHEN AND MARK RUNWAY (TO 60,000#)	5,000 L.F.
EXTEND MEDIUM INTENSITY RUNWAY LIGHTS	1,000 L.F.
EXTEND, PAVE AND MARK TAXIWAY SYSTEM (60,000#)	1,200 L.F.
STRENGTHEN AND MARK TAXIWAY SYSTEM (TO 60,000#)	6,100 L.F.
PAVE AND MARK HOLDING APRON (60,000#)	5,000 S.F.
INSTALL MEDIUM INTENSITY TAXIWAY LIGHTS	6,500 L.F.
PAVE AND MARK PARKING APRONS (60,000#)	98,000 S.F.
EXPAND VASI SYSTEM	2 ENDS
INSTALL MICROWAVE LANDING SYSTEM (OR EQUIVALENT)	1 END
INSTALL PARKING APRON LIGHTING	1,200 L.F.
CONSTRUCT CRASH, FIRE, RESCUE STATION	2,500 S.F.
CONSTRUCT CONTROL TOWER (BY FAA)	1 EACH
PAVE AND MARK HELIPORT	19,000 S.F.
PAVE AND MARK AIRPORT ROADWAYS	500 L.F.
PAVE AND MARK AUTOMOBILE PARKING FACILITIES	90 AUTOS
CONSTRUCT TERMINAL/ADMINISTRATION BUILDING	5,000 S.F.
EXTEND FENCING	2,500 L.F.
CONSTRUCT TEE-HANGARS (PRIVATE DEVELOPMENT)	90 AIRCRAFT

300 0 300 600
SCALE IN FEET



ULTIMATE AIRPORT PROPERTY

AURORA STATE AIRPORT

DEVELOPMENT STAGING

FIGURE 30

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