OREGON
Department of Aviation

AURORA STATE AIRPORT

DRAFT AIRPORT MASTER PLAN

Aurora, OR
May 2025

CENTURY WEST
ENGINEERING

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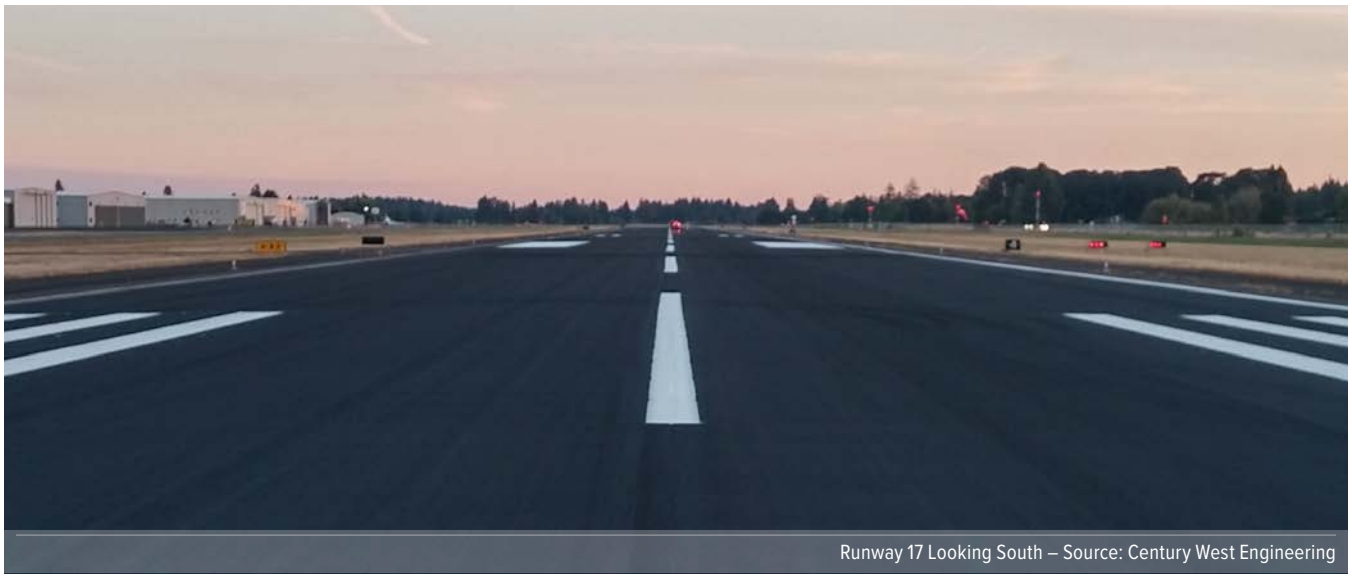


Runway 17 Looking South – Source: Century West Engineering

Chapter 1

Introduction

The Oregon Department of Aviation (ODAV) is preparing an Airport Master Plan (AMP) for Aurora State Airport (Airport) in cooperation with the Federal Aviation Administration (FAA) to define the Airport's needs for the next 20 years. The Airport Master Plan will provide specific guidance to maintain a safe and efficient airport that is economically, environmentally, and socially sustainable.

A glossary of common aviation terminology and list of acronyms is provided in **Appendix 1**.

Project Purpose and Need

The purpose of the Airport Master Plan is to define the current, short-term, and long-term needs of the Airport through a comprehensive evaluation of facilities, conditions, and FAA airport planning and design standards. The study will also address elements of local planning (land use, transportation, environmental, economic development, etc.) that have the potential of affecting the planning, development, and operation of the Airport. The FAA requires airports to maintain current planning as conditions change. This Airport Master Plan will address changing local conditions, current FAA standards, and trends within the aviation industry.

Project Funding

Funding for the Airport Master Plan is being provided through an FAA Airport Improvement Program (AIP) grant (AIP grant 3-41-004-022; $994,764). The AIP is a dedicated fund administered by FAA with the specific purpose of maintaining and improving the nation's public-use airports. The AIP is funded exclusively through fees paid by users of general aviation and commercial aviation. This project received 100% funding from the FAA, which includes COVID recovery funds. No local match was required.

100% FAA Funded Project

Total: $994,764

Goals of the Airport Master Plan

The primary goal of the master plan is to provide the framework and vision needed to define future facility needs at Aurora State Airport. The FAA sets out goals and objectives each master plan should meet to ensure future development will cost-effectively satisfy aviation demand and consider potential environmental and socioeconomic impacts.

Goal 1: Define the vision for the Airport to effectively serve airport users and the region. Assess known issues including air traffic control, runway length, ability to accommodate development, auto parking, fencing, and land use to develop a realistic, sustainable plan to improve the Airport.

Goal 2: Document existing activity, condition of airfield facilities, and policies that impact airport operations and development opportunities.

Goal 3: Forecast future activity based on accepted methodology.

Goal 4: Evaluate facilities and conformance with applicable local, state, and FAA standards.

Goal 5: Identify facility improvements to address design conformance issues and accommodate demand.

Goal 6: Identify potential environmental and land use requirements that may impact development.

Goal 7: Explore alternatives to address facility needs. Work collaboratively with all stakeholders to develop workable solutions to address needs.

Goal 8: Develop an Airport Layout Plan to graphically depict proposed improvements consistent with FAA standards as a road map to future development. Prepare a supporting Capital Improvement Plan to summarize costs and priorities.

Goal 9: Provide recommendations to improve land use and zoning oversight of the Airport to remove barriers to appropriate growth at the Airport.

Goal 10: Summarize the vision and plan for the Airport in the Airport Master Plan report.

Source: FAA with Century West airport-specific content.

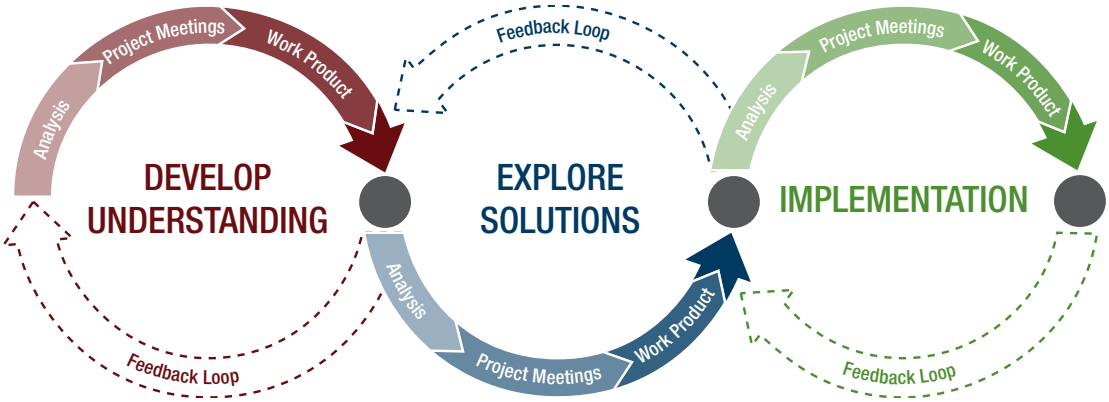
THE FAA ROLE IN THE AIRPORT MASTER PLAN

FAA *Advisory Circular (AC) 150/5070-6B Airport Master Plans* defines the specific requirements and evaluation methods established by FAA for the study. 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.

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 Aviation Activity Forecasts and Airport Layout Plan.

Planning Process

The three-phase planning process is designed to provide multiple feedback loops intended to maintain the flow of information and ideas among the community and project stakeholders and ultimately maximize public involvement.



Framework of the Airport Master Plan

The framework of the Airport Master Plan provides a clear structure to inform and steer future planning decisions and serve as a tool to guide a process that allows the plan to take shape through flexibility, iteration, and adaptation. The framework is based upon an airport-urban interface model intended to analyze the regional setting of the Airport, its landside elements and airside elements, as well as the management and administration functions associated with the Airport. The framework provides guidance while being flexible enough to adapt to changing conditions to maximize opportunities to develop understanding, explore solutions, and implement the preferred development alternatives for the Airport and adjacent urban and rural environments.

	Regional Setting	Airside Elements	Landside Elements	Airport Administration
Develop Understanding **Explore Solutions** **Implementation**	Location & Vicinity Socio-Economic Data Airport Role Airport History Area Airports Context Airport Operations Applicable Planning Studies Environmental Data Local Surface Transportation Land Use/Zoning	Area Airspace Approach Procedures FAA ATCT Runway/Helipad Taxiways/Taxilanes Aprons/Tiedowns Pavement Condition FAA Design Standards Support Facilities	General Aviation (GA) Terminal Areas Through-the-fence (TTF) Agreements Hangars Airport Surface Roads Vehicle Parking Airport Fencing Utilities	Airport Ownership & Management Airport Financials Airport Rates and Charges Local Codes and Regulations Oregon Aviation Laws FAA Compliance Overview

Project Schedule

The Aurora State Airport Master Plan schedule is expected to occur over 18 months, Phase 1 – Develop Understanding will take approximately five months; Phase 2 – Explore Solutions will take approximately eight months; and Phase 3 – Implementation will take approximately five months including three months for FAA approvals, which can take from three to six months after delivery of the final draft narrative reports and drawings.

The original project schedule at the start of the master plan reflected an 18-month process. The overall planning process has extended over 4-years based on the additional public outreach from ODAV and their planning team and thorough review and coordination with FAA.

Develop Understanding

Late 2021 – Early 2023

- Chapter 1 - Introduction
- Chapter 2 - Existing Conditions
- Chapter 3 - Aviation Activity Forecasts
  * FAA Forecast Review & Approval Point

Mid 2022 – End 2022

- AGIS Survey

Explore Solutions

Mid 2023 – End 2023

- Chapter 4 - Facility Goals and Requirements
- Chapter 5 - Airport Development Alternatives
  * To include Modification of Standards Analysis

Implementation

Early 2025

- Chapter 6 - Airport Layout Plan
- Chapter 7 - Strategies & Actions, Capital Improvement Plan, and Financial Plan

Mid 2025

- Finalize Master Plan

Public Involvement Process

A comprehensive and engaging public involvement process is a key element to a successful Airport Master Plan. Therefore, numerous opportunities for public input are built into the process. ODAV is completing the Aurora Airport Master Plan in accordance with the Department of Land Conservation and Development's (DLCD) State Agency Coordination (SAC) Program. Accordingly, ODAV established a Planning Advisory Committee (PAC) that includes members from all affected Federal, State, Local Special Districts, and Interested Parties. The PAC will meet nine times throughout the 18-month Aurora State Airport Master Plan project timeline. All PAC meetings are open to the public.

Planning Advisory Committee Meetings

The PAC was assembled to provide input and allow for public dissemination of data. Airport tenants, pilots, local & regional economic development interests, neighbors of the airport, and staff/representatives of ODAV serve as members of the PAC. In addition to the membership composition noted above, representatives from the FAA Seattle Airports District Office (ADO) serve as ex officio members of the PAC.

TABLE 1-1: PLANNING ADVISORY COMMITTEE MEMBERS

Organization	Name	Alternate
1000 Friends of Oregon	Roger Kaye	
AABC/TLM Holdings	Ted Millar	
Atlantic Aviation (formerly Lynx Aviation)	Trent Brownlee	
Aurora Air Traffic Control	Raul Suarez	
Aurora Airport Improvement Association	Bruce Bennett	
Aurora Butteville Barlow Community Planning Organization	Ken Ivey	
Aurora CTE, Inc	Bill Graupp	
Charbonneau Country Club	Steven P. Switzer	
City of Aurora	Brian Asher	
City of Canby	Scott Archer	
City of Wilsonville	Dr. Joann Linville	Chris Neamtzu
Clackamas County	Commissioner Tootie Smith	
Columbia Helicopters	Rob Roedts	Bob Buchanan
Confederated Tribes of Siltez Indians	Robert Kentta	
Confederated Tribes of the Grand Ronde Community of Oregon	Cheryl Pouley	
Confederated Tribes of Warm Springs Reservation of Oregon	Christian Nauer	
Deer Creek Estates HOA	Matt Williams	
Friends of French Prairie	Ben Williams	Wayne Richards
Helicopter Transport Service	Robert Fournier	
Life Flight Network	Ben Clayton	
Marion County	Commissioner Danielle Bethell	
Marion County Planning Department	Austin Barnes	Brandon Reich
Oregon Dept of Aviation	Tony Beach	
Oregon Dept of Aviation Board	Cathryn Stephens	
Oregon Dept of Land Conservation and Development	Matt Crall	Nicole Mardell
Oregon Dept of Transportation	Naomi Zwerdling	
Oregon Farm Bureau	Mary Anne Cooper	
Oregon Office of Emergency Management	Sarah Puls	
Positive Aurora Airport Management	Tony Helbling	
Regional Solutions	Jody Christensen	
Vans Aircraft	Rian Johnson	Greg Hughes
Willamette Aviation	David Waggoner	
Wilsonville Chamber of Commerce	Patrick Donaldson	Kevin O'Malley

Runway 17-35 – Source: ODAV

Chapter 2

Existing Conditions Analysis

The existing conditions analysis documents the existing airfield assets and conditions that affect the operation and development of Oregon Department of Aviation (ODAV)-owned facilities with emphasis on the Airport's regional setting, and its airside, landside, and administrative functions. The existing conditions analysis utilizes site visits, FAA and Sponsor documentation and records, and other publicly available information to support the effort. The findings documented in this chapter will be referenced to support subsequent studies and recommendations throughout the master planning process. A survey of airport stakeholders is being conducted to acquire additional information to help guide the planning process. This information will be summarized and added to the Airport Master Plan documentation.

Regional Setting

The Regional Setting section is comprised primarily of features that provide the "big-picture" context of the Airport within its local community and region. This section describes the location and vicinity of the Aurora State Airport and provides a range of information related to the operation and function of the Airport: socio-economic data, airport history, airport role, area airports context, airport activity data, environmental data, local surface transportation systems, land use on and around the Airport, and other relevant data.

LOCATION AND VICINITY

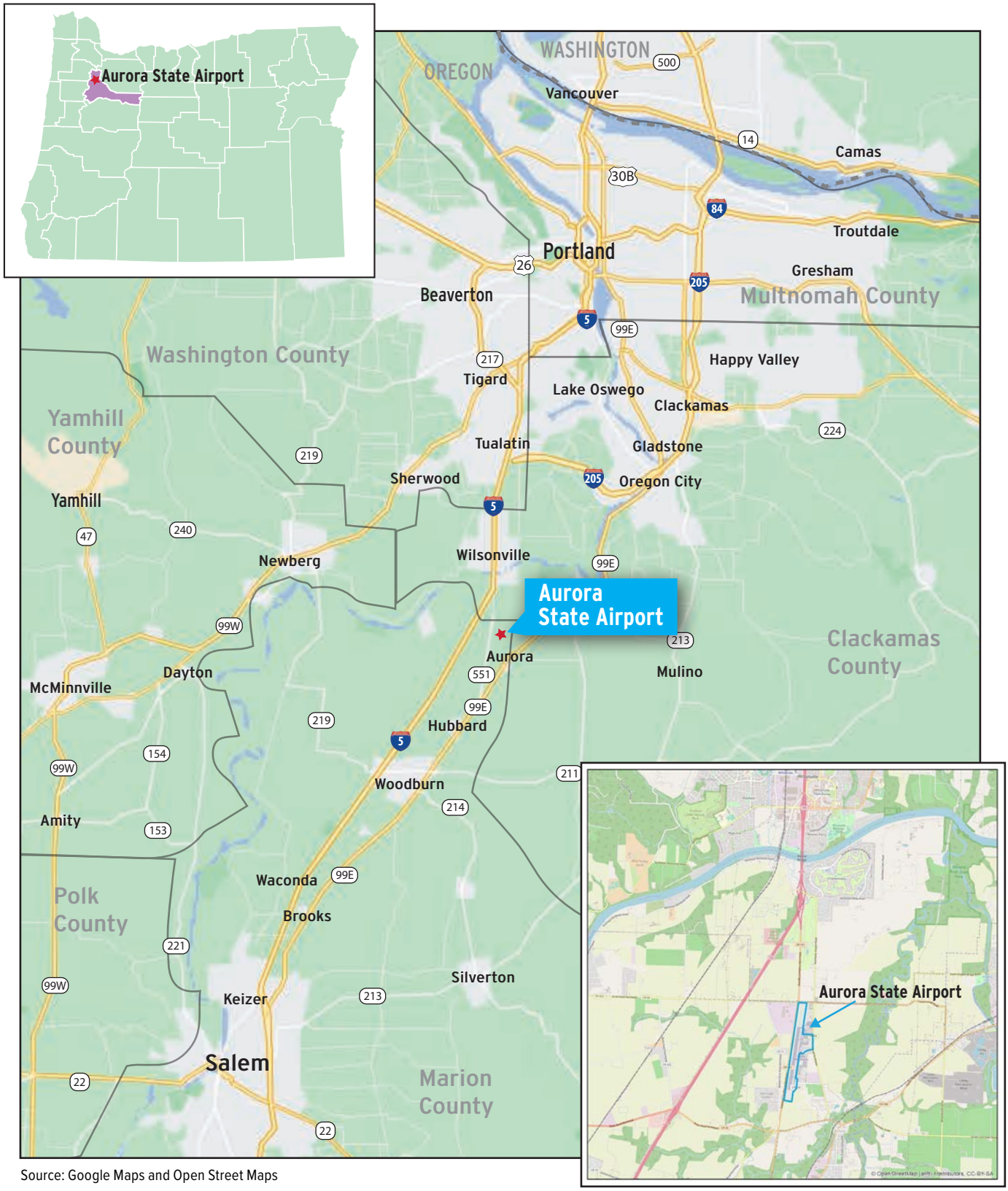
The community of Aurora, Oregon is located in the Willamette Valley in Marion County. Aurora is located about three miles east of the U.S. Interstate 5 (I-5) corridor, 23 miles south of Portland. Aurora is located within 15 miles of three other adjacent counties (Washington, Yamhill, and Multnomah).

Aurora State Airport is located approximately one mile northwest of the City of Aurora, in Northwest Marion County. The north end of the Airport is located immediately adjacent to the Clackamas County western boundary (at Arndt Road).

Marion County has a land area of approximately 1,193 square miles. The county extends east from the Willamette Valley into the Cascade Range, including Mount Jefferson. Incorporated cities include Salem, Keizer, Woodburn, Silverton, and Aurora. Salem is the county seat.

Clackamas County has a land area of approximately 1,883 square miles. The county extends east from the Willamette Valley into the Cascade Range, including Mount Hood. Incorporated cities include Barlow, Canby, Gladstone, Happy Valley, Lake Oswego, Milwaukie, Oregon City, West Linn, and Wilsonville. Oregon City is the county seat.

FIGURE 2-1: LOCATION AND VICINITY MAP



Source: Google Maps and Open Street Maps

COMMUNITY SOCIO-ECONOMIC DATA

Data from the Population Research Center (PRC) at Portland State University was reviewed to gauge recent changes in population within the Airport's service area. PRC data confirms that the areas within 30 to 60 minutes of Aurora State Airport have experienced steady growth over the past 10 years, often outpacing statewide growth rates. Sustained population growth within an airport's service area is often a general indication of broader economic conditions required increase airport activity. Historical PRC population estimates and average annual growth rates (AAGR) for these areas are presented in **Table 2-1**.

TABLE 2-1: HISTORIC POPULATION ESTIMATES

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Oregon	3,883,735	3,919,020	3,962,710	4,013,845	4,076,350	4,141,100	4,195,300	4,236,400	4,243,791	4,266,560
AAGR:	-	0.91%	1.11%	1.29%	1.56%	1.59%	1.31%	0.98%	0.17%	0.54%
Marion County	320,495	322,880	326,150	329,770	333,950	339,200	344,035	347,760	349,120	347,182
AAGR:	-	0.74%	1.01%	1.11%	1.27%	1.57%	1.43%	1.08%	0.39%	-0.56%
Clackamas County	381,680	386,080	391,525	397,385	404,980	413,000	419,425	423,420	426,515	425,316
AAGR:	-	1.15%	1.41%	1.50%	1.91%	1.98%	1.56%	0.95%	0.73%	-0.28%
Portland	601,510	592,120	587,865	613,355	627,395	639,100	648,740	657,100	664,675	658,773
AAGR:	-	-1.56%	-0.72%	4.34%	2.29%	1.87%	1.51%	1.29%	1.15%	-0.89%
Salem	156,455	157,770	159,265	160,690	162,060	163,480	165,265	167,400	168,970	177,694
AAGR:	-	0.84%	0.95%	0.89%	0.85%	0.88%	1.09%	1.29%	0.94%	5.16%
Wilsonville	20,515	21,550	21,980	22,870	23,740	24,v315	25,250	25,635	25,915	27,186
AAGR:	-	5.05%	2.00%	4.05%	3.80%	2.42%	3.85%	1.52%	1.09%	4.90%
Aurora	930	935	950	950	970	980	985	985	985	1,133
AAGR:	-	0.54%	1.60%	0.00%	2.11%	1.03%	0.51%	0.00%	0.00%	15.03%

Source: PSU Population Research Center (PRC), 2021

A review of economic data also indicates broad growth in the region over the last decade. According to Woods & Poole Economics[1] data, the gross regional products (GRP) of Marion and Clackamas counties have both experienced steady growth over the last 10 years (average annual growth of 4.28% and 3.59%, respectively).

It should be noted that the economic effects of the COVID-19 pandemic are evident in the 2020 data when GRP for both counties decreased -3.77% (Marion) and -3.19% (Clackamas). These declines are attributed to state and local restrictions put in place to slow the spread of the virus, and the corresponding economic contraction. However, data for 2021 highlights economic recovery fueled in part by federal stimulus and steps toward economic recovery.

A summary of Marion and Clackamas County GRPs over the past decade is presented in **Table 2-2**.

TABLE 2-2: HISTORIC GROSS REGIONAL PRODUCT (2012 DOLLARS)

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Marion County (millions)	$11,546	$11,865	$12,287	$13,311	$14,0921	$14,6971	$15,532	$16,132	$15,523	$16,761
Percent Change	-	2.76%	3.56%	8.33%	5.87%	4.29%	5.68%	3.86%	-3.77%	7.97%
										AAGR 4.28%
Clackamas County (millions)	$15,497	$15,520	$15,505	$16,734	$17,606	$18,569	$19,613	$20,237	$19,592	$21,172
Percent Change	-	0.15%	-0.10%	7.93%	5.21%	5.47%	5.62%	3.19%	-3.19%	8.07%
										AAGR 3.59%

Source: Woods & Poole Economics, Inc. Washington, D.C. Copyright 2021. Woods & Poole does not guarantee the accuracy of this data. The use of this data and the conclusion drawn from it are solely the responsibility of Century West Engineering, Inc.

1 2021 State Profile - Woods & Poole Economics, Inc. Copyright 2021

AIRPORT HISTORY

Aurora State Airport was built by the United States Army Air Forces in 1943 and was known as the Aurora Flight Strip. From the time of construction until 1953 it was managed by the United States Bureau of Public Roads, when it was transferred to the State of Oregon's Highway Division. In 1973, the Highway Division transferred ownership to the State Aeronautics Division, which would later become ODAV. ODAV remains the owner and operator of Aurora State Airport today.

Although the general configuration of the single-runway airfield has remained largely unchanged, several notable airport facility improvements have been made during the nearly 50 years of State of Oregon ownership:

- **1976** – runway reconstructed and parallel taxiway constructed;
- **1979 and 1986** – property acquisition (22 acres, 10 acres) increased ODAV-owned property to the current 140 acres;
- **1995** – runway length increased to 5,003 feet;
- **2004** – runway reconstructed;
- **2009** – parallel taxiway shifted east, to its current location; and
- **2015** – Air Traffic Control Tower (ATCT) constructed.

During this period, aeronautical use facilities such as aircraft hangars were developed both on ODAV property and on privately-owned land parcels adjacent to the east side of the Airport. These off-airport properties have agreements with ODAV (referred to as "through-the-fence", or "TTF" agreements) to access the Aurora State Airport at designated points. Development of two privately-owned heliports adjacent to the east side of Airport has also occurred. However, these facilities do not have TTF access agreements and their operations are fully independent of the Aurora State Airport.

Several planning studies have been completed through the Airport's history, including FAA-funded master plans in 1976, 1988, and 2012. A Constrained Operations – Runway Justification Study was completed in 2019 to review the recommended runway improvements defined in the 2012 Airport Master Plan Update. A list of recent FAA AIP funded projects is presented below in **Table 2-3**.

TABLE 2-3: PROJECT HISTORY

Fiscal Year	Federal Grant Sequence Number	Project Description	Federal Grants/Funds	State of Oregon Grants/Funds
2005	11	Rehabilitate Runway - 17/35	$1,100,000	$0
2007	12	Construct Taxiway, Install Miscellaneous NAVAIDS, Install Taxiway Lighting	$1,959,856	$0
2007	13	Construct Taxiway, Install Miscellaneous NAVAIDS, Install Taxiway Lighting	$2,293,993	$0
2009	14	Remove Obstructions	$100,000	$0
2009	15	Conduct Miscellaneous Study (Airport Master Plan Update)	$534,431	$0
2010	16	Continued Study - Airport Master Plan Update	$64,600	$0
2013	17	Rehabilitate Apron, Rehabilitate Taxiway	$139,393	$0
2015	18	Construct Taxiway, Rehabilitate Apron, Rehabilitate Taxiway, Rehabilitate Taxiway	$1,289,561	$0
2015	—	2015 IGA/Proj Number 26906 Aurora Air Traffic Control Tower	$2,695,000	$141,852
2016	19	Rehabilitate Taxiway	$639,502	$0
2017	20	Conduct Environmental Study (Phase 1)	$189,635	$0
2017	–	SOAR-2017-ODA-S-00016, Constrained Operations Study	$0	$70,000
2017	–	SOAR-2017-SO PROJ 3, Ramp Light Repairs	$0	$13,000
2020	–	SOAR-2020-ODA-S-00002, Taxiway Repair, Obstruction Easement Survey, Obstruction Removal	$0	$ 330,000
2021	21	Environmental Assessment for Obstruction Removal (Phase 2)	$ 140,294	$0
2021	22	Airport Master Plan Study and AGIS Survey	$994,764	$0

Source: FAA AIP Grant Look Up Tool (Accessed 12/10/2021) and ODAV provided state grant information.

AIRPORT ROLE

The role of an airport may vary within the context of the National, State, or Local perspective. Understanding the existing roles of the Airport is vital to establish the long-term vision and development of the facility.

National Role

The federal airport system, referred to as the National Plan of Integrated Airport Systems (NPIAS), includes 3,304 public-use airports in all 50 states.[2] Fifty-seven of Oregon's 97 public-use airports are included in the NPIAS. Like federal highways, NPIAS airports represent a critical element of the national transportation system.

NPIAS reports are submitted every two years to Congress in accordance with title 49 United States Code (U.S.C.), section 47103. As required by the statute, the Federal Aviation Administration (FAA) *"...shall maintain the plan for developing public-use airports in the United States." The statute also requires that: "The plan shall include the kind and estimated cost of eligible airport development the Secretary of Transportation considers necessary to provide a safe, efficient, and integrated system of public-use airports adequate to anticipate and meet the needs of civil aeronautics, to meet the national defense requirements of the Secretary of Defense, and to meet identified needs of the United States Postal Service."*

NPIAS airports are grouped into two major categories: primary (commercial service) and non-primary (general aviation and limited passenger service). The majority of NPIAS airports are non-primary general aviation airports. Within the broad definition of general aviation airports, four functional categories are defined: National, Regional, Local, and Basic.

Aurora State Airport is designated a **"National" Nonprimary General Aviation** airport. The role of National airports in the NPIAS is defined as follows:

> *"National airports (84) are located in metropolitan areas near major business centers and support flying throughout the nation and the world. National airports are currently located within 31 states. They account for 13 percent of total flying at the studied general aviation airports and 35 percent of all flights that filed flight plans at the airports in the four new categories. These 84 airports support operations by the most sophisticated aircraft in the general aviation fleet. Many flights are by jet aircraft, including corporate and fractional ownership operations and air taxi services. These airports also provide pilots with an alternative to busy primary commercial service airports. There are no heliports or seaplane bases in this category.*
>
> *Criteria Used to Define the New National Category (all numbers are annualized):*
>
> *1. 5,000+ instrument operations, 11+ based jets, 20+ international flights, or 500+ interstate departures; or*
>
> *2. 10,000+ enplanements and at least one charter enplanement by a large certificated air carrier; or*
>
> *3. 500+ million pounds of landed cargo weight."*

Available data indicate that Aurora State Airport has consistently met or exceeded the FAA's "11+ based jet" and "5,000+ instrument operations" criteria established for National airports since the early 2000s. Aurora State Airport, and nearby Portland-Hillsboro Airport (19 miles northwest) are the only FAA-designated National Airports located in Oregon.

NPIAS airports are deemed significant to the air transportation in the United States, and thus are eligible for federal funding though the Airports Improvement Program (AIP), which currently covers 90% of eligible costs of planning and development projects.

State Role

The Oregon Department of Aviation has developed and periodically updates the Oregon Aviation Plan (OAP) to provide guidance on preserving the State's system of airports. The OAP presents a framework for improving the system to enhance support of local communities and regional economic development. The current OAP (OAP v6.0), completed in 2019, classified Aurora State Airport as **Category II – Urban General Aviation Airport**. The definition for Category II airports is:

2 2021-2025 NPIAS Report, Federal Aviation Administration (9/30/2020)

> *"These airports support all general aviation aircraft and accommodates 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."*

The most demanding user requirements for Category II airports are typically related to business class aircraft since the airports do not support commercial airline service. Category II airports serve large/multi-state geographic regions and generally experience higher levels of general aviation activity.

The distribution of Category II airports throughout Oregon is a reflection of the state's physical geography, population centers, and the underlying market conditions required to support the full range of general aviation activity common to this type of airport. As documented in OAP v6.0, Oregon has a total 11 Category II airports, which includes one public-use heliport (Portland Downtown Heliport). More than half (6 of 11) of Oregon's Category II airports are located within 30 nautical miles of Aurora State Airport. The concentration of Category II airports in the Portland Metro area is consistent with the region's overall population and economic characteristics. Four of Oregon's Category II airports currently have an air traffic control tower (ATCT); three of these, including Aurora State Airport, are located in the Portland Metro area.

OAP-defined characteristics for Category II airports correspond to the business jet aircraft segment of general aviation. These airports accommodate a wide range of locally-based and transient aircraft that are designed to operate in all-weather conditions. These aircraft require increased facility capabilities for runways, taxiways, instrument approaches/departures, and airfield lighting systems.

Local Role

Aurora State Airport serves the local community in several ways. Based on data reviewed in late 2021, the Airport is currently home to 281 aircraft stored both on ODAV-owned property, and on adjacent privately-owned property with authorized airport access. A review of 2016-2021 Aurora ATCT operations data shows mostly consistent year-over-year increases during the six-year period, ranging from roughly 48,000 to 70,000 annual operations. Additional aircraft flight activity occurs outside the ATCT hours of operation between 0700 and 2000 local time (7:00 am to 8:00 pm in standard time terms). Detailed breakdowns of airport activity are provided later in this chapter and in Chapter 3 – Aviation Activity Forecasts.

The (2019) OAP v6.0[3] states that Aurora State Airport supported 2,672 direct, indirect, and induced jobs, contributing over $125 million in payroll benefits to the local economy (2014 data). The Airport accommodates several businesses including two Fixed Base Operators (FBOs), three flight schools, several aircraft manufacturing and service providers, and a restaurant. OAP v6.0 estimates a total of nearly $510 million in sales revenue/output is generated from airport businesses annually. Two examples of the numerous businesses based at Aurora State Airport include the Life Flight Network administrative office, which supports life-saving medevac services across the Pacific Northwest Region, and Vans Aircraft, a leading kit aircraft manufacturer.

AREA AIRPORT CONTEXTUAL ANALYSIS

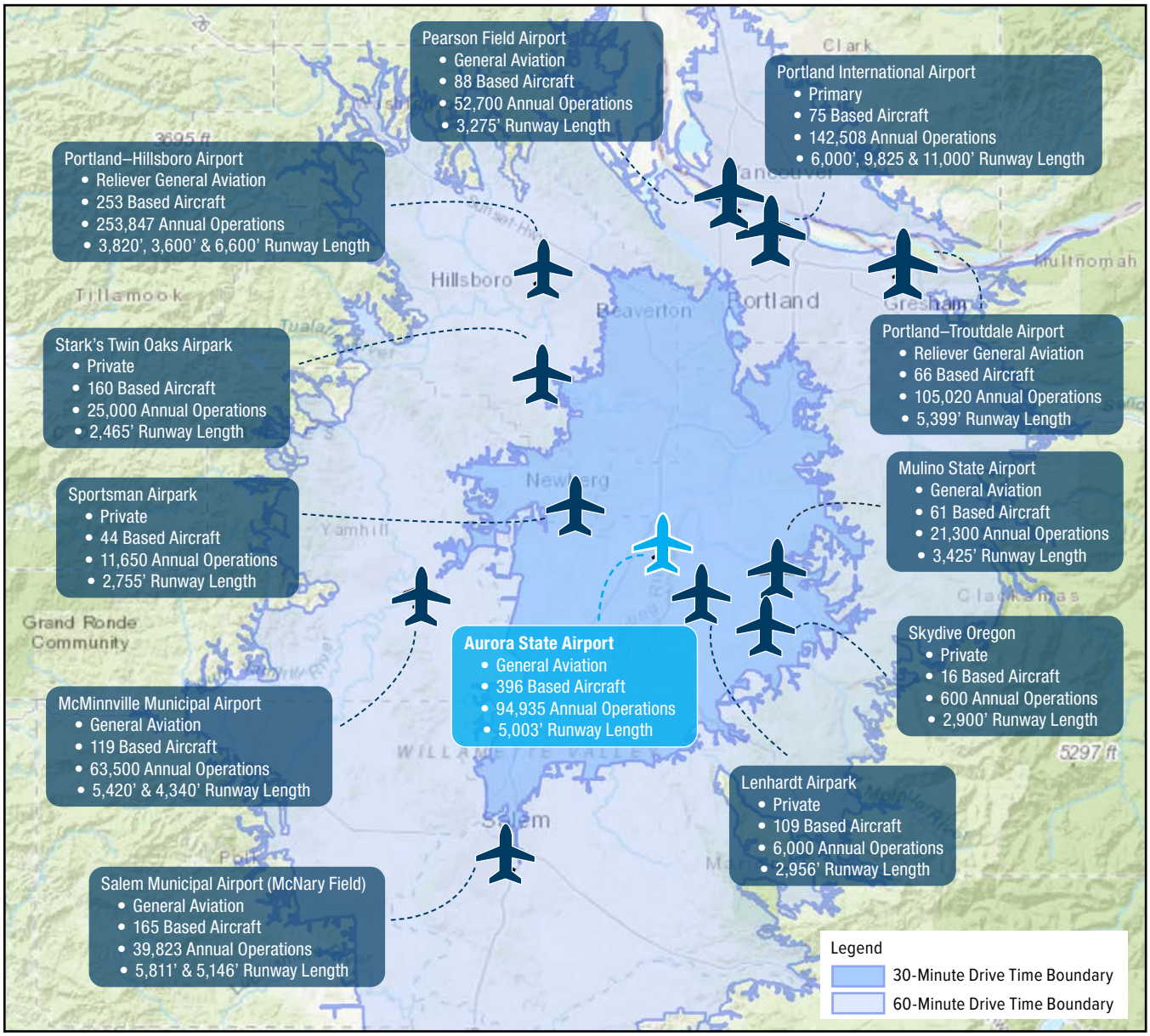
Contextual analysis of the airport service area examines the impact that the airport has on its immediate geographic area. For general aviation airports, the majority of aviation activity can be directly linked to their service area boundaries defined by 30- and 60-minute driving times surrounding the Airport. The airports and aviation activity within a defined service area may directly affect activity at any individual airport in the service area. This ranges from locally-based aircraft to transient aircraft where operators choose airports based in part on proximity to their place of business or travel destination.

Figure 2-2 (and **Table 2-4** at the end of this section) provide an overview of the public-use airports located in the service area for Aurora State Airport. These airports include both publicly-owned and privately-owned facilities. The most recent FAA Airport Master Record Form (5010) data available is presented for these airports to provide common reporting of activity. It is noted that the FAA 5010 data listed for Aurora State Airport is obsolete, but will be revised to reflect the 2021 baseline data developed in the Airport Master Plan. Current based aircraft and aircraft operations data for Aurora State Airport are provided later in this chapter and will be used to develop the aviation activity forecasts (Chapter 3).

3 OAP v6.0 Chapter 8: Economic Impact

As noted in the state airport classification system, an airport's functional role is determined primarily by facility capabilities and factors such as the size of the population it serves. The airports in the local area accommodate a wide range of general aviation activity. Aurora State Airport, Portland-Hillsboro Airport, and Portland International Airport accommodate the majority of business aviation activity in the Portland Metro area, while the smaller airports accommodate predominately smaller aircraft. Portland International Airport (PDX) is the primary commercial service airport serving the local area and region. PDX also accommodates a limited amount of general aviation activity. With the exception of PDX, the other public-use airports located within the service area for Aurora State Airport do not accommodate scheduled airline service.

FIGURE 2-2: AREA AIRPORTS



Source: AirportIQ 5010, Esri, USGS, NOAA

Portland International Airport

Portland International Airport (PDX) is located in northeast Portland, in Multnomah County on the south bank of the Columbia River. The Airport is owned and operated by the Port of Portland and is the largest commercial service airport in Oregon. It has three lighted runways with instrument approach capabilities and full range of aircraft services. The Airport is primarily focused on commercial airline service, but also supports a limited amount

of general aviation (GA) activity, 75 GA based aircraft and 10,391 annual GA operations, according to the most recent 5010 data. The Port of Portland also owns Hillsboro and Troutdale Airports, which serve as GA reliever airports to Portland International.

Portland – Hillsboro Airport

Portland-Hillsboro Airport, owned by the Port of Portland, is located in Hillsboro, 10 miles west of Portland. The Airport is a designated reliever GA airport for PDX and serves the Portland Metro Area. The Airport has three lighted runways with instrument approach capabilities, an ATCT, and weather reporting. Available services include aviation fuel, hangars and parking, aircraft repair and maintenance, flight training, aircraft rental, and air taxi (charter) services. Current FAA 5010 data lists 253 based aircraft and 253,847 annual operations.

Portland – Troutdale Airport

Portland-Troutdale Airport, also owned by Port of Portland, is in Troutdale in northern Multnomah County between Interstate 84 (I-84) and the Columbia River. The Airport is a designated GA reliever airport for Portland International. The Airport has a single lighted runway, instrument approach capabilities, an ATCT, and weather reporting. Available services include aviation fuel, hangars and parking, parking, aircraft repair and maintenance, flight training, and aircraft rental. Current FAA 5010 data lists 66 based aircraft and 105,020 annual operations.

Pearson Field Airport

Pearson Field Airport is owned by the City of Vancouver and located on the south side of the city in Clark County, Washington. The Airport is located north of the Columbia River and State Highway 14, approximately two miles northwest of Portland International Airport. The Airport has a single lighted runway with instrument approach capabilities, and weather reporting. Available services include aviation fuel, hangars and parking, aircraft repair and maintenance, flight training, and aircraft rental. Current FAA 5010 data lists 88 based aircraft and 52,700 annual operations.

McMinnville Municipal Airport

McMinnville Municipal Airport is in the City of McMinnville in Yamhill County, on the southeast side of the city. The Airport is owned and operated by the City of McMinnville. The Airport has two runways (one lighted), instrument approach capabilities, and weather reporting. Available services include aviation fuel, hangars and parking, aircraft repair and maintenance, flight training, and aircraft rental. Current FAA 5010 data lists 199 based aircraft and 63,500 annual operations.

Salem Municipal Airport (McNary Field)

Salem McNary Field is owned and operated by the City of Salem and located within the city limits two miles southeast of downtown. The Airport previously had scheduled commercial airline service, but the service ended in 2011 and current activity is limited to GA and military operations (Oregon Army National Guard). McNary Field is also the home of the ODAV offices. It has two lighted runways and a helipad, instrument approach capabilities, an ATCT, and weather reporting. Available services include aviation fuel, hangars and parking, aircraft repair and maintenance, flight training, and aircraft rental. Current FAA 5010 data list 165 based aircraft and 39,823 annual operations.

Mulino State Airport

Mulino State Airport is ODAV-owned and operated, and is located in the Hamlet of Mulino, along State Highway 213, approximately five miles north of the City of Molalla. The Airport has a single lighted runway with visual approach capabilities. Available services include aviation fuel, hangars and parking, and aircraft repair and maintenance. Current FAA 5010 data lists 61 based aircraft and 21,300 annual operations.

Stark's Twin Oaks Airpark

Stark's Twin Oaks Airpark is a privately-owned, public-use airport located south of Hillsboro, approximately 13 miles northwest of Aurora State Airport. The Airport has a single lighted runway with visual approach capabilities. Available services include aviation fuel, aircraft parking, hangars and parking, flight training, and aircraft rental. Current FAA 5010 data lists 160 based aircraft and 25,000 annual operations.

Lenhardt Airpark

Lenhardt Airpark is a privately-owned, public-use airport located east of Hubbard, approximately three and a half miles south of Aurora State Airport. The Airport has a paved lighted runway and a parallel grass strip on the west side of the runway, both with visual approach capabilities. Available services include aviation fuel, hangars and parking, aircraft maintenance, flight training, and aircraft rental. Current FAA 5010 data lists 109 based aircraft and 6,000 annual operations.

Sportsman Airpark

Sportsman Airpark is a privately-owned, public-use airport located within the city limits of Newberg, approximately eight miles northwest of Aurora State Airport. The Airport has a single lighted runway with visual approach capabilities. Available services include aviation fuel, hangars and parking, aircraft maintenance, flight training, and aircraft rental. The airpark also serves as a launching point for hot air balloon operations. Current FAA 5010 data lists 44 based aircraft and 11,650 annual operations.

Skydive Oregon

Skydive Oregon Airport is a privately-owned, private use airport located on the west side of Molalla, approximately eight miles southeast of Aurora State Airport. The Airport has a single lighted runway with visual approach capabilities. Skydive Oregon Airport facilitates skydiving operations and instruction services offered by a resident provider also called Skydive Oregon. While the airport has fuel and hangars on site, these services support the skydiving operations and are not available to the public. Current FAA 5010 data lists 16 based aircraft and 600 annual operations.

A summary of the most recent FAA 5010 data for theses airports is presented in **Table 2-4**. As note earlier, the 5010 data is provided for general reference only as a broad indication of activity. Relevant data to be updated in the aviation activity forecasts (Chapter 3).

TABLE 2-4: FAA 5010 DATA

	Aurora State	Lenhardt	Sportsman	Mulino State	Skydive Oregon	Stark's Twin Oaks	McMinnville	Hillsboro	Salem	Portland Int.	Pearson Field	Troutdale	Total
Air Carrier	0	0	0	0	0	0	0	0	0	113,737	0	0	113,737
Air Taxi	7,909	0	100	0	0	0	0	9,561	3,776	16,168	100	4,000	41,614
GA Local	32,177	1,250	3,875	13,000	400	7,000	22,000	160,261	12,043	3,517	18,375	70,000	343,898
GA Itinerant	54,569	4,750	7,675	8,300	200	18,000	40,000	83,381	20,330	6,874	34,125	29,520	307,724
Military	280	0	0	0	0	0	1,500	644	3,674	2,212	100	1,500	9,910
TOTAL OPERATIONS	**94,935**	**6000**	**11,650**	**21,300**	**600**	**25,000**	**63,500**	**253,847**	**39,823**	**142,508**	**52,700**	**105,020**	**816,883**
TOTAL BASED AIRCRAFT	**396**	**109**	**44**	**61**	**16**	**160**	**119**	**253**	**165**	**75**	**88**	**66**	**1,552**
Single Engine	287	108	31	59	15	159	94	163	141	16	83	56	1212
Multi Engine	26	1	2	2	1	1	7	26	10	39	4	3	122
Jet	34	0	0	0	0	0	3	41	6	19	0	0	103
Helicopters	49	0	11	0	0	0	15	23	8	1	1	7	115
Glider	3	0	0	2	0	0	4	5	2	0	1	0	17
Military	0	0	0	0	0	0	0	0	19	21	0	0	40
Ultra-Light	1	4	0	0	4	1	0	0	0	0	0	0	10
OPBA[1]	239	55	265	349	38	568	521	1001	219	354	598	1569	447

Source: AirportIQ 5010 Airport Master Records and Reports (AirportIQ5010.com, Accessed 12/6/2021)
1. OPBA ratio includes general aviation and air taxi operations only. This is a ratio of total aircraft takeoffs and landings divided by the number of aircraft based at the airport.

AIRPORT OPERATIONS SUMMARY

Aurora State Airport accommodates a wide variety of aeronautical activity, including small single- and multi-engine aircraft, business class turbine aircraft (business jets and turboprops), helicopters, and gliders.

Based Aircraft

In late 2021, the ODAV State Airport Manager reviewed the based aircraft count for Aurora State Airport in the FAA based aircraft registry database. The count was previously updated in 2018 (349 based aircraft). The review was completed in consultation with the FAA Seattle Airports District Office in December 2021, and resulted in a new validated count of 281 based aircraft. The reduction in the Airport's based aircraft total reflects a more precise verification of aircraft and removal of previously-counted aircraft (helicopters) located at two private heliports adjacent to the Airport. Please see Chapter 3 - Aviation Activity Forecasts, for a full description of the current based aircraft count.

Aurora State Airport is unique compared to many other airports in that the majority of its based aircraft are stored off airport property, on privately-owned land parcels. These aircraft are referred to as "through-the-fence" (TTF) users. The private land owners are responsible for securing access to Airport property through formal TTF agreements with the airport owner (ODAV). The aircraft stored on these parcels access the Airport seamlessly at designated TTF points. The TTF access points at Aurora State Airport do not have gates and aircraft move freely between the Airport and the adjacent private property.

TABLE 2-5: BASED AIRCRAFT AND FLEET MIX

BA Type	On-Airport	TTF	Total
Single Engine	45	175	220
Multi Engine	1	14	15
Jet	3	33	36
Helicopter	1	9	10
Total	**50**	**231**	**281**

Source: National Based Aircraft Inventory – January 2022

Flight operations for the TTF aircraft rely on the Airport's runway-taxiway system, lighting, and navigational aids to access area airspace in the same manner as on-airport based aircraft. As noted above, the current based aircraft count does not include helicopters located at two privately owned heliports located adjacent to the Airport. A summary of all based aircraft by type and storage location is presented in **Table 2-5**.

Aircraft Operations

The ATCT at Aurora State Airport has been in service daily since October 2015. Controllers in the ATCT log aircraft contacts in the airport airspace, including arriving and departing aircraft, as well as aircraft transiting the airspace (without originating or terminating at the Airport). The resulting counts are available to the public through FAA's Operations Network (OPSNET) Traffic Counts datasets. To serve as a base for the Aurora State Airport operations estimate, the OPSNET Airport Traffic Counts dataset was downloaded for the period of 2016 through 2021, representing the six full years that the ATCT has been in service.

The Airport Traffic Counts dataset includes departure and arrival counts for itinerant aircraft (in both visual and instrument flight rules conditions)[4], local GA, and local military aircraft. The OPSNET Airport Traffic Counts for 2016-2021 are summarized in **Table 2-6**. These counts are unadjusted and provide the basis for a more detailed evaluation of aircraft operations at Aurora State Airport.

TABLE 2-6: OPSNET AIRPORT TRAFFIC COUNTS

Calendar Year	Itinerant Total	Local Total	Total Operations
2016	33,195	15,182	48,377
2017	34,641	23,511	58,152
2018	36,629	26,374	63,003
2019	34,252	28,598	62,850
2020	31,777	34,172	65,949
2021	35,566	34,176	69,742
Total:	206,060	162,013	368,073

Source: FAA OPSNET – January 2022

4 Visual Flight Rules (VFR) apply to aircraft operating with minimum visibility and cloud clearance requirements to maintain safe flight operations in visual meteorological conditions. Instrument Flight Rules (IFR) apply to aircraft operated under instrument flight plans, capable of meeting aircraft equipment and pilot requirements to operate exclusively with electronic guidance from ground or satellite navigational aids.

Aurora ATCT is in service daily between 0700 and 2000 local time. It should also be noted that in 2021 the ATCT was out of service outside of the normal schedule for portions of seven days. On February 13th, 2021 the ATCT opened 18 minutes late due to winter storm conditions, and due to a staffing shortage ATCT went to reduced hours (0800 to 1745 local time) Oct 29th - 31st, and Nov 3rd, 6th, and 10th. Total down time was 19 hours and 48 minutes, accounting for less than 0.5% of the scheduled service time scheduled for the year. These closures and their impact on the aggregated Airport Traffic Counts are not significant.

For airport master planning purposes, the evaluation of aircraft activity will be limited to aircraft physically operating on the Airport's runway-taxiway system. Since the remote facility operations do not require any physical contact with the Airport's runway-taxiway system, the flight activity (and based aircraft) will be removed from datasets.

During data collection annual operations estimates were requested from two off-airport private heliport operators. Each operator estimated between 200 and 300 annual operations were generated at their individual facilities, yielding a total of approximately 600 annual operations. However, in later discussions, the ATCT manager estimated the off-airport helicopter activity to be closer to 3% of total ATCT-logged itinerant operations for the Airport (approximately 1,200 operations in 2021).

The planning team determined that the higher ATCT estimate should be used to ensure that all off-airport helicopter operations were identified and removed from the Airport's operations totals. A reduction of 3% was applied to itinerant operations as reported by the OPSNET Airport Operations Report to account for the helicopter flight activity associated with the two adjacent heliports.

After-Hour Operations Estimates

Outside of the scheduled service times, the Aurora ATCT is not staffed and aircraft operations at Aurora State Airport are not counted. After-hours operations are known to exist (see below) and they need to be estimated, and added to the Airport Traffic Counts to develop an accurate baseline operations total.

The *2019 Constrained Operations Runway Justification Study* for Aurora State Airport addressed after-hours operations hours by assuming that 95% of all airport operations occur during ATCT service hours, and inversely 5% occur outside of those hours. This is a standard method that has been employed at other airports in similar situations, and the resultant baseline counts were approved by FAA for use in the study's forecasts. However, the availability of additional flight data supports a more precise approach.

Instrument Aircraft Flight Activity

FAA Traffic Flow Management System (TFMS) records were obtained through a Freedom of Information Act (FOIA) request. These records provide Instrument Flight Rules (IFR) flight plan arrivals and departures for all airports nationwide and include information on each aircraft, departure and arrival airports, and departure and arrival dates and times, among other data. Nearly 10 years of Aurora State Airport records were available for analysis—January 1, 2012 through August 16, 2021. Consultants have requested the remaining 2021 data through the FOIA process and will incorporate the data when available to complete the 2021 counts.

Flight records where Aurora State Airport was listed as either the departing or arrival airport were queried from the TFMS dataset, resulting in 79,885 IFR operations over the 10-year period. This time period predates the period that ATCT began service. However, arrival and departure times of IFR operations are likely minimally dependent on the presence of an ATCT, and the additional data increased the sample size provides a higher level of confidence in the resultant ratios. Although the TFMS data is based on actual flight plans that are not affected by the operating hours of the ATCT, the data distributions provide a reliable record of after-hours activity at the Airport.

Each of the TFMS operations was classified as occurring either during or outside of ATCT service hours based on arrival or departure timestamps. The timestamps are provided in the 24-hour format used in Coordinated Universal Time (UTC), which does not reflect local time change due to daylight savings time. This was then accounted for in the queries based on departure and arrival dates included in each record.

The queries showed that 86.1% (68,778) of IFR operations during the period occurred during the scheduled ATCT service time, and 13.9% (11,107) occurred outside of the scheduled service hours. To simplify calculations, the splits for IFR operations were rounded (86/14) for in-service and out-of-service operations ratios.

A breakdown of annual TFMS operations data based on the on- and off-hours schedule of the ATCT is presented in **Table 2-7**. The "ATCT open/closed" periods listed in the table are intended to provide time of day consistency when comparing TFMS data, and does not reflect actual period of ATCT operation, which began in late 2015.

TABLE 2-7: TFMS OPERATIONS DATA (ORGANIZED BY ATCT HOURS)

	ATCT Open Ops	ATCT Closed Ops	Total Ops	% Closed
2012*	6,110	703	6,813	10.32%
2013*	6,417	645	7,062	9.13%
2014*	6,450	1,014	7,464	13.59%
2015*	6,838	1,242	8,080	15.37%
2016	7,882	1,436	9,318	15.41%
2017	7,771	1,406	9,177	15.32%
2018	8,265	1,476	9,741	15.15%
2019	7,676	1,238	8,914	13.89%
2020	6,649	1,071	7,720	13.87%
2021	4,720	876	5,596	15.65%
Total	**68,778**	**11,107**	**79,885**	**13.90%**

Source: Century West Engineering developed using FAA TFMS Data
* Data prior to October 2015 ATCT opening

As the ratio was derived using only IFR flight plan data, it is valid for estimating only IFR operations, but does not capture activity conducted outside of IFR flight plans. This would include aircraft operating visually, with or without visual flight rules (VFR) flight plans. While the OPSNET Traffic Counts provide hard counts of VFR traffic during ATCT service hours, off-hours traffic is not represented in the OPSNET or other available datasets. However, as previously mentioned, other studies have employed a general 5% (of total operations) estimate to approximate all traffic outside of ATCT service hours. Inversely, 95% of VFR operations were assumed to occur during ATCT service hours. It is reasonable to apply that same method to account for after-hours VFR activity at Aurora State Airport. While not as precise as the above IFR method, it is the best option available evaluating available data.

The above discussed ratios were applied to OPSNET Airport Traffic Counts (ATCT in-service) to approximate IFR and VFR operations occurring when the ATCT was closed. A summary of IFR and VFR operations by ATCT status, as well as the resulting total annual operations estimates are presented in **Table 2-8**.

TABLE 2-8: ANNUAL OPERATIONS (ATCT ADJUSTED)

	2016	2017	2018	2019	2020	2021
ATCT Open (86%) - IFR	9,880	10,018	10,522	7,515	6,576	7,596
ATCT Closed (14%) - IFR	1,608	1,631	1,713	1,223	1,071	1,237
Total IFR	**11,488**	**11,649**	**12,235**	**8,738**	**7,647**	**8,833**
ATCT Open (95%)- VFR	37,501	47,095	51,381	54,306	58,418	63,835
ATCT Closed (5%) - VFR	1,974	2,479	2,704	2,858	3,075	3,360
Total VFR	**39,475**	**49,574**	**54,085**	**57,164**	**61,493**	**67,195**
ATCT Open - Total	47,381	57,113	61,903	61,821	64,994	71,431
ATCT Closed - Total	3,582	4,110	4,417	4,081	4,146	4,597
Total Ops	**50,963**	**61,223**	**66,320**	**65,902**	**69,140**	**76,028**
% ATCT Closed Ops	7.56%	7.20%	7.14%	6.60%	6.38%	6.44%

Source: Century West Engineering developed using FAA TFMS Data

The adjusted operations estimates align well with the previous approved forecast developed in the 2019 *Constrained Operations Runway Justification Study*. Using a 5% after-hours estimate across the board, that study approximated 66,153 operations for the 2018 base year. Using the updated methodology, the adjusted 2018 operations count is 67,478, an increase of 0.25%. Considering the heavier weight that was placed on IFR operations occurring outside of ATCT service hours, coupled with the removal of the erroneous itinerant helicopter operations, the slight increase is reasonable.

Operations Fleet Mix

To better understand the operational demand that the Airport's fleet composition has on the facility, an operations mix analysis was completed. The OPSNET Airport Traffic Counts attribute the airport operations to individual itinerant and local aircraft classifications. These classifications include:

- Itinerant
  - » Air Taxi
  - » General Aviation
  - » Military
- Local
  - » Civil (General Aviation)
  - » Military

The percentage of operations that each classification composes of the annual totals was calculated for each year that the ATCT has been in service to create ratios for each classification for each year. The ratios for each classification were assumed to apply to all operations regardless of ATCT status. The resultant ratios were applied to the historical operations estimates described above. The results of the exercise are summarized in **Table 2-9**.

TABLE 2-9: ANNUAL OPERATIONS FLEET MIX (HISTORICAL)

	2016	2017	2018	2019	2020	2021
Itinerant						
Air Taxi	2,194	2,319	2,121	1,670	1,129	2,006
General Aviation	32,174	33,502	35,665	33,638	31,621	36,390
Military	265	199	277	107	38	79
Subtotal	**34,633**	**36,020**	**38,063**	**35,415**	**32,788**	**38,475**
Local						
General Aviation	16,191	25,075	28,011	30,453	36,333	37,488
Military	139	129	245	34	19	65
Subtotal	**16,330**	**25,204**	**28,256**	**30,487**	**36,352**	**37,553**
Total	**50,963**	**61,223**	**66,320**	**65,902**	**69,140**	**76,028**

Source: Century West Engineering developed using FAA OPSNET Data

The OPSNET Airport Traffic Count data only differentiate local and itinerant traffic for GA aircraft. Understanding the demand placed on the Airport by different sizes and types of aircraft is also important. A review of FAA Traffic Flow Management System Counts (TFMSC) data illustrates an evolving fleet mix at the Airport over the previous 10-year period. TFMSC data captures instrument flight plan filings, which provides a reliable indication of activity trends for this segment of airport activity.

The FAA categorizes aircraft activity by Aircraft Approach Category – AAC (approach speed during landing) and Airplane Design Group - ADG (wingspan and tail height). **Table 2-10** provides examples of aircraft representative of AAC/ADG types ranging from small single-engine piston aircraft (A-I small) to large transport category jets (D-IV). In general, larger, and faster aircraft require larger operating surfaces and protected areas. **Table 2-11** provides a summary of operations by select aircraft at Aurora State Airport organized by AAC/ADG. The current and future AAC/ADG for Aurora State Airport will be determined following FAA approval of the aviation activity forecasts, which includes approval of the current and future design aircraft. The design aircraft represents the most demanding aircraft type that generates at least 500 annual operations.

TABLE 2-10: AIRCRAFT APPROACH CATEGORY (AAC) AND AIRPLANE DESIGN GROUP (ADG)

Aircraft Approach Category	Aircraft Approach Speed knots	Airplane Design Group	Aircraft Wingspan
A	less than or equal to 91	I	less than or equal to 49’
B	92 to 121	II	50’ to 79’
C	122 to 141	III	80’ to 118’
D	142 to 166	IV	119’ to 171’

A-I (small) 12,500 lbs. or less

Beech Baron 55
Beech Bonanza
Cessna 182
Piper Archer

B-I (small) 12,500 lbs. or less

Beech Baron 58
Beech King Air C90
Cessna 402
Cessna 421

A-II, B-II (small) 12,500 lbs. or less

Super King Air 200
Pilatus PC-12
DCH Twin Otter
Cessna Caravan

B-II Greater than 12,500 lbs.

Super King Air 300, 350
Beech 1900
Cessna Citation
Falcon 20, 50

A-III, B-III Greater than 12,500 lbs.

DHC Dash 7, Dash 8
Q-200, Q-300
DC-3
Convair 580

C-I, D-I

Lear 25, 35, 55, 60
Israeli Westwind
HS 125-700

C-II, D-II

Gulfstream II, III, IV
Canadair 600
Canadair Regional Jet
Lockheed JetStar

C-III, D-III

Boeing Business Jet
Gulfstream 650
B 737-300 Series
MD-80, DC-9

C-IV, D-IV

B - 757
B - 767
DC - 8-70
DC - 10

Source: Century West Engineering

TABLE 2-11: TFMSC IFR DATA - SELECT JET AIRCRAFT WITH MAXIMUM CERTIFICATED TAKEOFF WEIGHT OF MORE THAN 12,500 POUNDS

TFMSC IFR Data - Select Jet Aircraft with Maximum Certificated Takeoff Weight of More than 12,500 Pounds												
	AAC/ADG	Aircraft Designator	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
BAE HS 125*	B-I	HS25	2	0	0	0	0	0	0	0	0	0
Beechjet 400/400A/400XP	B-I	BE40	32	64	46	34	26	14	4	6	22	38
Beechjet Premier/Raytheon 390 Premier	B-I	PRM1	68	100	88	76	66	4	16	12	4	4
Cessna 500 Citation I	B-I	C500	0	4	6	0	20	20	2	0	0	0
Cessna 501 Citation I Special	B-I	C501	78	66	46	14	16	12	30	16	8	20
Cessna Citation CJ-2	B-I	C25A	44	68	176	82	74	188	232	148	100	182
Dassault Falcon 10	B-I	FA10	64	74	70	90	16	0	10	0	0	0
Sabreliner 40/60	B-I	SBR1	2	4	0	2	2	0	0	0	2	0
Cessna 550 Citation Bravo*	B-II	C55B	0	0	0	0	0	0	6	0	0	16
Cessna 550 Citation II/Bravo	B-II	C550	210	134	162	224	260	158	212	174	138	162
Cessna 551 Citation II/Special	B-II	C551	6	4	6	14	56	26	12	0	4	0
Cessna 560 Citation V Encore/Ultra	B-II	C560	362	496	460	580	688	772	706	618	546	622
Cessna 560 XL Citation Excel/XLS	B-II	C56X	102	118	132	258	316	396	430	392	340	278
Cessna 650 Citation III/IV	B-II	C650	90	90	118	144	118	114	98	68	66	42
Cessna 680 Citation - Latitude	B-II	C68A	0	0	0	0	0	4	10	30	30	40
Cessna 680 Citation Sovereign	B-II	C680	64	52	68	72	64	90	138	150	138	250
Cessna 750 Citation X	B-II	C750	60	74	90	94	90	94	104	92	84	38
Cessna Citation CJ-3	B-II	C25B	46	36	26	100	86	106	90	302	182	66
Cessna Citation CJ-4	B-II	C25C	6	12	2	4	10	72	60	622	618	730
Dassault Falcon 20	B-II	FA20	90	84	28	14	98	74	76	68	66	82
Dassault Falcon 2000/EX	B-II	F2TH	2	14	6	4	6	4	34	130	108	346
Dassault Falcon 50/EX	B-II	FA50	10	18	96	220	310	316	276	284	216	302
Dassault Falcon 900/B/C/EX	B-II	F900	180	144	48	8	54	80	68	100	26	16
Embraer EMB545/Legacy 450	B-II	E545	0	0	0	0	2	2	0	0	4	2
Embraer Phenom 300	B-II	E55P	14	102	96	92	86	122	56	80	256	430
Hawker Horizon	B-II	HA4T	2	2	2	0	0	0	0	2	2	6
Dassault Falcon F7X	B-III	FA7X	0	0	0	0	0	0	4	4	2	0
Hawker 600	C-I	H25A	0	0	2	0	0	0	0	0	0	0
Hawker 800/800XP	C-I	H25B	224	210	310	118	42	28	34	20	8	32
IAI Westwind 1124	C-I	WW24	10	8	4	2	10	2	2	4	0	0
Learjet 28*	C-I	LJ28	0	0	0	2	0	0	0	0	0	0
Learjet 31	C-I	LJ31	4	2	0	0	6	54	92	110	32	22
Learjet 40	C-I	LJ40	10	0	8	0	4	0	2	0	2	6
Learjet 45/XR	C-I	LJ45	110	148	180	236	240	208	110	136	122	204
Learjet 55	C-I	LJ55	0	2	0	0	2	0	4	2	0	0
Learjet 60	C-I	LJ60	2	4	10	82	36	14	30	14	6	10
Bombardier Challenger 300	C-II	CL30	32	90	64	72	78	104	88	78	62	54
Bombardier Challenger 350	C-II	CL35	0	0	0	4	2	0	22	54	80	104
Bombardier Challenger 600/601/604	C-II	CL60	126	122	36	12	64	80	58	52	90	68
Cessna 700 Citation - Longitude*	C-II	C700	0	0	0	0	0	0	0	0	0	18
Embraer ERJ 135/140/Legacy	C-II	E135	0	4	6	0	2	2	0	0	0	0
Embraer Legacy 500*	C-II	E550	0	0	0	0	0	2	0	0	0	4
Gulfstream 150	C-II	G150	2	0	0	2	2	6	80	22	4	2

Continued on next page

TABLE 2-11: TFMSC IFR DATA - SELECT JET AIRCRAFT WITH MAXIMUM CERTIFICATED TAKEOFF WEIGHT OF MORE THAN 12,500 POUNDS

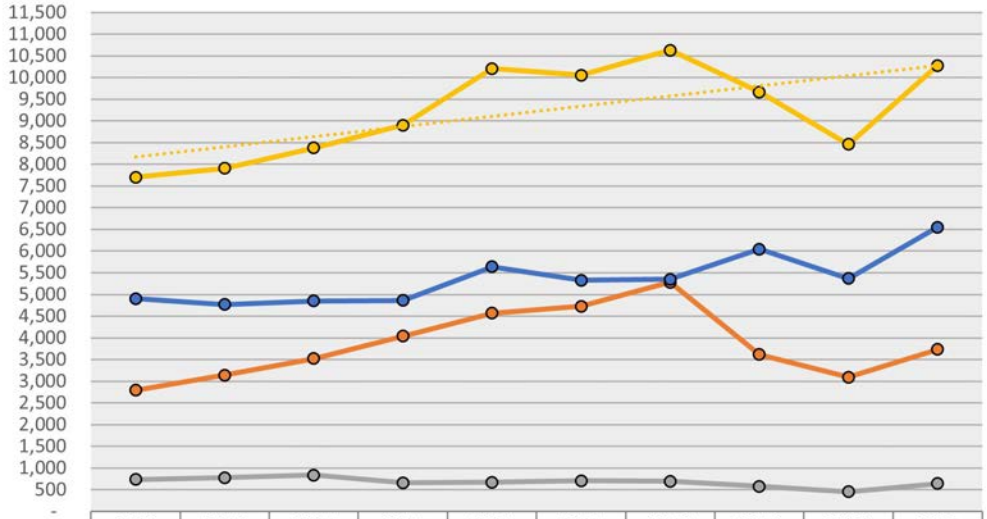
TFMSC IFR Data - Select Jet Aircraft with Maximum Certificated Takeoff Weight of More than 12,500 Pounds												
	AAC/ADG	Aircraft Designator	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Gulfstream 280	C-II	G280	0	0	6	2	0	0	0	2	0	2
Gulfstream II/G200	C-II	GLF2	2	0	0	0	0	0	0	0	0	0
Gulfstream III/G300	C-II	GLF3	0	0	2	2	2	0	0	0	0	2
IAI Astra 1125	C-II	ASTR	178	152	164	114	160	162	96	14	0	4
IAI Galaxy 1126	C-II	GALX	8	10	16	0	2	4	0	4	2	2
Learjet 70	C-II	LJ70	0	0	0	0	0	0	2	0	2	0
Learjet 75	C-II	LJ75	0	0	0	0	4	10	12	0	2	4
Bombardier Global 5000	C-III	GL5T	0	0	0	0	0	0	0	2	0	0
Bombardier Global Express	C-III	GLEX	18	10	4	8	0	14	50	52	10	0
Learjet 35	D-I	LJ35	2	8	16	0	4	6	8	4	0	12
Gulfstream IV/G400	D-II	GLF4	4	0	4	0	2	6	2	8	26	84
Gulfstream V/G500	D-III	GLF5	6	10	4	2	0	4	2	0	4	6
Gulfstream VI/G600	D-III	GLF6	0	0	0	0	6	4	2	0	0	0
Total			**2272**	**2540**	**2608**	**2784**	**3132**	**3378**	**3370**	**3876**	**3414**	**4312**
B-I			290	380	432	298	220	238	294	182	136	244
B-II			1244	1380	1340	1828	2244	2430	2376	3112	2824	3428
B-III			0	0	0	0	0	0	4	4	2	0
C-I			360	374	514	440	340	306	274	286	170	274
C-II			348	378	294	208	316	370	358	226	242	264
C-III			18	10	4	8	0	14	50	54	10	0
D-I			2	8	16	0	4	6	8	4	0	12
D-II			4	0	4	0	2	6	2	8	26	84
D-III			6	10	4	2	6	8	4	0	4	6
Operations by AAC C and D Jets			**738**	**780**	**836**	**658**	**668**	**710**	**696**	**578**	**452**	**640**
Operations by ADG II and III Jets			**1910**	**2158**	**2078**	**2344**	**2788**	**3066**	**3088**	**3586**	**3244**	**4026**

Note: Operations by militarty, turboprop, and piston aircraft are not represented in the the counts above
* AAC/ADG data was not provided in TFMSC. Classifications were assigned according to FAA Aircraft Characteristics Database

As shown in **Figure 2-3**, while total TFMSC activity is trending upward, instrument-related operations by aircraft smaller than AAC/ADG B-I have declined significantly over the past three years, causing a decrease in total TFMSC operations over the same period. However, during this period, operations by AAC/ADG B-I and larger aircraft have remained steady or increased. These data indicate that instrument activity at the Airport is evolving toward a more diverse mix of larger aircraft including multi-engine piston, turboprops, and jets, while the volume of single-engine piston aircraft activity has declined.

This observation is further supported by fuel flowage data presented in **Table 2-12** below. Over the six years of available data, and accounting for decreased activity in 2020 due to the impacts of COVID-19, aviation gasoline (AVGAS) flowage has shown a decreasing trend while jet fuel flowage has increased.

FIGURE 2-3: TFMSC IFR OPERATIONS DATA



	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Total	7,700	7,908	8,376	8,902	10,208	10,050	10,630	9664	8460	10280
Smaller than B-I Aircraft	2,796	3,138	3,524	4,040	4,568	4,726	5,278	3,618	3,092	3,732
B-I and Larger Aircraft	4,904	4,770	4,852	4,862	5,640	5,324	5,352	6,046	5,368	6,548
Total C and D Aircraft	738	780	836	658	668	710	696	578	452	640

Source: Century West Engineering developed using FAA TFMSC Data

TABLE 2-12: AURORA STATE AIRPORT FUEL FLOWAGE

	2016	2017	2018	2019	2020	2021	Total
Jet Fuel gallons	933,527	896,058	1,050,306	929,453	893,989	1,055,344	3,769,806
AVGAS gallons	107,900	134,397	150,515	117,445	79,196	92,808	481,553

Source: Oregon Department of Aviation

APPLICABLE PLANNING STUDIES/DOCUMENTS

This section summarizes existing planning documents, federal advisory documents and background information directly related to the Aurora State Airport and the Aurora State Airport Master Plan. The documents in this section were utilized by Century West Engineering and the ODAV to support the production of the Aurora State Airport Master Plan. The documents included in this section represent the most comprehensive information related to the Aurora State Airport Master Plan that were available to the ODAV at the time of publication.

FAA Advisory Circulars

The FAA publishes a series of documents known as Advisory Circulars (AC) aimed at providing guidance to airports, airport users, and consultants for compliance with Code of Federal Regulations (CFR) pertaining to a variety of operational, engineering, and planning issues. While not an exhaustive list, the following ACs are commonly referenced during the airport master planning process. Additional ACs may be introduced and referenced as the plan develops.

- *AC 150/5070-6B, Airport Master Plans* – Provides guidance for the preparation of airport master plans that range in size and function from small general aviation to large commercial service facilities
- *AC 150/5300-13B, Airport Design* – Contains the Federal Aviation Administration's (FAA) standards and recommendations for the geometric layout and engineering design of runways, taxiways, aprons, and other facilities at civil airports
- *AC 150/5060-5, Airport Capacity and Delay* – Explains how to compute airport capacity and aircraft delay for airport planning and design
- *AC 150/5325-4B, Runway Length Requirements for Airport Design* – Provides guidelines for airport designers and planners to determine recommended runway lengths for new runways or extensions to existing runways

Marion County Comprehensive Plan

The Marion County Comprehensive Plan[5] (Adopted: May 13, 1981 by Ord No. 601; subsequent periodic updates through 2021) was developed for the purpose of providing a guide to development and conservation of Marion County's land resources. It is a long-range policy and land use guide that provides the basis for decisions on the physical, social, and economic development of Marion County. The Marion County Comprehensive Plan incorporates elements and policies of other Marion County planning documents through a formal process.

The following policies were identified in the Goals and Policies section of the Marion County Comprehensive Plan to address airports in the County[6]:

- *"Airports and airstrips shall be located in areas that are safe for air operations and should be compatible with surrounding uses."*
- *"The County should review and take appropriate actions to adopt State master plans for public airports in Marion County."*
- *"The County will adopt appropriate provisions (including plans, ordinances and intergovernmental agreements) to protect the public airports from incompatible structures and uses. These provisions will be consistent with Federal Aviation Administration guidelines."*
- *"The County will discourage noise-sensitive uses from locating in close proximity to public airports."*

Marion County Rural Transportation System Plan

Marion County completed the *Rural Transportation System Plan* (RTSP) in 2005 with the intent of "providing framework for developing an efficient, well-balanced, and cost-effective transportation system for the next 20 years".[7] The RTSP addresses rural transportation facilities managed by Marion County outside of Urban Growth Boundaries (UGB). Transportation planning topics for areas within UGBs are addressed in individual city transportation system plans (E.g. City of Aurora Transportation System Plan). The RTSP has been formally adopted into the Marion County Comprehensive Plan.

5 Marion County Comprehensive Plan (May 1981, Ord No. 601); Revised: July 1994 by Ord 979, October 1998 by Ord 1091, May 2000 by Ord 1130, July 2000 by Ord 1118, August 2000 by Ord 1131, January 2001 by Ord 1132 and Ord 1139, December 2002 by Ord 1166, February 2008 by Ord 1260 and Ord 1261, September 2010 by Ord 1308, and June 2021 by Ord 1435

6 Marion County Comprehensive Plan, pg. 58

7 Marion County RTSP Page 2-1

The RTSP lists Aurora State Airport among the County's 25 airports and heliports (as of 2005), and references the projects outlined in the 1999 Aurora State Master Plan, most of which have been completed since the plan was developed. The RTSP states that the County intended to adopt the 2005 update to the Aurora State Airport Master Plan after review to ensure compatibility with County land use and zoning requirements.[8]

Marion County is in the early stages of planning for an update to the RTSP as it approaches the end of its 20-year planning period. In 2012-2013, an update was started, but never formally adopted and ultimately not considered as an update to the plan. The County has applied for state grant funding to begin the necessary update to the RTSP.

City of Aurora Transportation System Plan

The City of Aurora developed its 2009 Transportation System Plan (TSP) to establish the City's goals, policies, and strategies to improve the transportation system within its UGB. The primary objective of the TSP is to "...enhance the general mobility throughout the City and offer guidance on multi-modal transportation decisions over the coming decades".[9]

While Aurora State Airport is not located within the Aurora UGB, its proximity to the city and its impact on residents warranted its inclusion in the plan. The following excerpt from the plan lays out the recommendations concerning the Airport.

> *"...For planning purposes, the City needs to continue to work with the Aurora State Airport and ODAV to help maintain and improve roadway access to and from the airport, as well as understand and address the effects of increased traffic flow on Airport and Ehlen Roads caused by airport growth. The increased growth will likely impact operations at intersections under the jurisdiction of the City, County, and ODOT. Mitigation for these impacts may be required in the future to ensure safety and efficient traffic operations."*[10]

Oregon Aviation Plan

In 2019, ODAV completed an update to the *Oregon Aviation Plan* (OAP v6.0) for the state airport system which includes 95 airports, one heliport, and one seaplane base. The study area was statewide and considered both commercial service and general aviation airports.

Each airport's level generally reflects the type of aircraft and customers the airport serves as well as the characteristics of the airport's service area. In the OAP update, Aurora State Airport is classified as Category II – Urban General Aviation Airport.

As a Category II airport, the OAP has identified certain facilities and services that should ideally be in place. These objectives are considered the "minimums" to which the airport should be developed. At this time Aurora State Airport meets all of the listed requirements with the exception of a precision instrument approach.

As part of the OAP update, annual economic impacts for 97 statewide airports were also estimated. General aviation operations at Aurora State Airport accounted for an estimated 2,672 direct, indirect, and induced jobs, which contribute over $125 million in payroll. Airport businesses are estimated to generate nearly $510 million in sales revenue/output annually.[11]

Oregon Resilience Plan

The Oregon Resilience Plan was completed in 2013, and provides analysis of key challenges, including the potential impact on Oregon's infrastructure and outlines a basic strategy for post disaster response coordination following a significant Cascadia seismic event. The overall expectation is that critical infrastructure components in coastal and western areas of the affected states will suffer complete loss or significant damage during a major event. The ability to respond will require coordinated use of assets outside the areas of damage. The plan identifies 29 airports throughout the state arranged into a three-tier system to indicate the priorities for making future investments:

- Tier 1 (T1) is comprised of the essential airports that will allow access to major population centers and areas considered vital for both rescue operations and economic restoration;
- Tier 2 (T2) is a larger network of airports that provide access to most rural areas and will be needed to restore major commercial operations; and

8 Marion County RTSP, pg. 2-7
9 Aurora Transportation System Plan, pg. 1-1
10 City of Aurora Transportation System Plan, pg. 3-21
11 OAP v6.0, Chapter 8, Tables 8-3, 8-4, 8-5

- Tier 3 (T3) airports will provide economic and commercial restoration to the entire region after a Cascadia subduction zone event.

Aurora State Airport is classified as a T3 airport. As a T3 airport the plan sets goals for reaching recovery milestones after an event. For Aurora, those goals are:

- To restore a Minimal level of recovery within 1-3 days: Restore essential services primarily for use of first responders, repair crews, and vehicles transporting critical supplies;
- To restore a Functional level of recovery within 1-3 months: Although service is not yet restored to full capacity, it is sufficient to get the economy moving again—e.g. some truck/freight traffic can be accommodated. There may be fewer lanes in use, some weight restrictions, and lower speed limits; and
- To restore an Operational level of recovery within 6-12 months: Restoration is up to 90% of capacity: A full level of service has been restored and is sufficient to allow people to commute to school and to work.

The study also modeled the potential impacts of a Cascadia magnitude 9.0 earthquake on the region using models from the United States Geological Survey (USGS) to simulate strong shaking that is likely to occur in such an event. The resulting simulated shaking map was then used to estimate the amount of ground failure due to liquefaction and landsliding that would occur. Liquefaction susceptibility values were assigned and then categorized into Low, Moderate, and High susceptibility categories. The results of the model scenario are publicly available via the Oregon Department of Geology and Mineral Industries (DOGAMI) Oregon HazVu: Statewide Geohazards Viewer website (https://gis.dogami.oregon.gov/maps/hazvu/). The HazVu viewer shows that the southern half of the airfield is classified as a Moderate hazard area and the north half is classified as a High hazard area.

2012 Aurora State Airport Master Plan Update

The validity of the AMPU was recently questioned as part of a petition for review made to the Oregon Land Use Board of Appeals ("LUBA"). In that land use action, the petitioners sought review of a 2019 Oregon Aviation Board Decision made pursuant to OAR 138-103-0055 in which the Board found that the AMPU was compatible with the Marion County Comprehensive Plan. Petitioners also filed in state Circuit Court as a precautionary measure in the event LUBA dismissed the matter for lack of jurisdiction. LUBA concluded that it lacked jurisdiction to hear this matter, but was overturned on appeal on that issue by the Court of Appeals. In December of 2021, the Oregon Supreme Court declined to review the Court of Appeal's decision and the matter was remanded back to LUBA. As directed by the Court of Appeals, LUBA ordered ODAV and the Board to submit a copy of the master plan documents that were before the Board in a 2011 adoption hearing. ODAV and the Board are unable to locate a copy of this document, and, based on an incomplete record, LUBA remanded the Board's 2019 Findings that the Board complied with OAR 138-103-0055 when it adopted the AMPU. LUBA further ordered that it was unable to resolve any of the other issues presented by the parties, including whether the Board lawfully adopted the AMPU. When completed, the 2021 Airport Master Plan will supersede the previous planning studies completed for Aurora State Airport.

Because of the missing master plan documents, the Board may be unable to demonstrate in a legal proceeding that the AMPU was lawfully adopted. However, there has been no decision by a court or the Board that the AMPU was not lawfully adopted and the time in which that decision may be challenged has passed under state law. Moreover, the studies and information conducted to support the AMPU were funded and required by FAA and did not require adoption under state law to be valid for FAA purposes. The circuit court cases remain pending but are expected be dismissed or otherwise resolved consistent with LUBA's order of remand.

2019 Constrained Operations Runway Justification Study

In 2019, the ODAV completed a study to update the aviation activity forecasts and review the runway length requirements at Aurora State Airport to consider if the eligibility threshold for a runway extension had been met. A constrained operations airport user survey was distributed as part of this study. The survey identified 645 constrained annual operations from a variety of aircraft and aircraft operators. Additional analysis of TFMSC data and the airport user surveys indicated more than 500 annual operations by aircraft to/from destinations beyond 1,000 nautical miles of Aurora State Airport. The study concluded that a runway length of 7,888 feet was justified by FAA methodologies (AC 150/5325-4B). However, consultants recommended a future runway length of 6,002 feet as it was identified in the 2012 Airport Master Plan and depicted on the ALP. While the justification for additional runway length was never formally accepted by FAA, the Aviation Activity Forecasts developed in the study received FAA approval in a letter dated September 26, 2019.

ENVIRONMENTAL DATA

Aurora has a warm-summer Mediterranean climate as classified by the Köppen climate classification system. The climate is characterized by cool, rainy winters, and warm, dry summers. The fall, winter, and spring seasons often have overcast, wet, and changing conditions, while the summers are warm and dry.

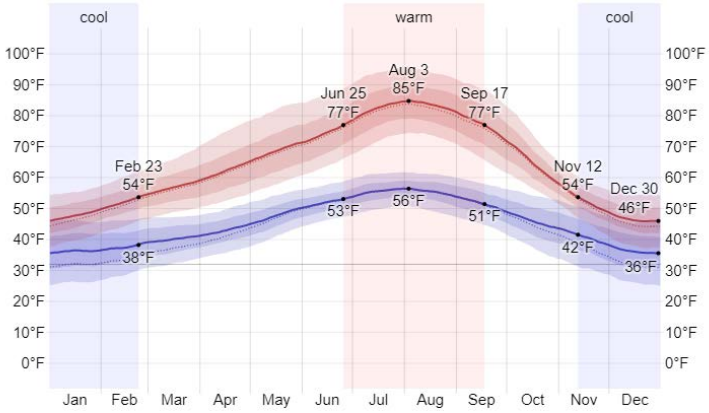
Average daily temperatures in Aurora range from a low of 40 degrees in December to a high of 68 degrees in July and August. The maximum average high temperature of the hottest month is 83 degrees in August, and the minimum average low temperature of the coldest month is 36 degrees in January and December. Annual temperature data are presented in **Figure 2-4**.

Precipitation at the Airport varies significantly throughout the year, as shown in **Figure 2-5**. The wet season lasts approximately seven months from mid-October to early-May. Inversely the dry season last approximately five months from early-May to mid-October. The airport receives an average of 52.3 inches of rainfall annually. The wettest month is December with an average of 8.7 inches; the driest month is July with an average of 0.5 inches of precipitation.

Sky conditions at the Airport, shown in **Figure 2-6**, vary significantly by season and are consistent with precipitation distributions. In general, the Airport experiences more instrument meteorological conditions (IMC) during the wetter months. The wetter, cloudy season generally begins in October and runs into early summer. The summer months are predominately partly cloudy, mostly clear, or clear—conditions that correspond to visual meteorological conditions (VMC).

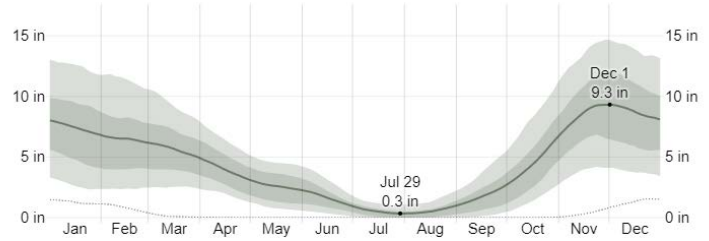
Wind data for the Airport indicates that prevailing wind directions vary by season. Spring and summer are characterized by north and west winds, while the fall and winter months observe winds from the south and east. See **Figure 2-7**. The FAA wind analysis computer program (Airport Data and Information Portal - Windrose Generator) confirms that the existing orientation of Runway 17/35 satisfies the FAA's minimum threshold of 95% crosswind coverage for all categories of aircraft.

FIGURE 2-4: ANNUAL TEMPERATURES



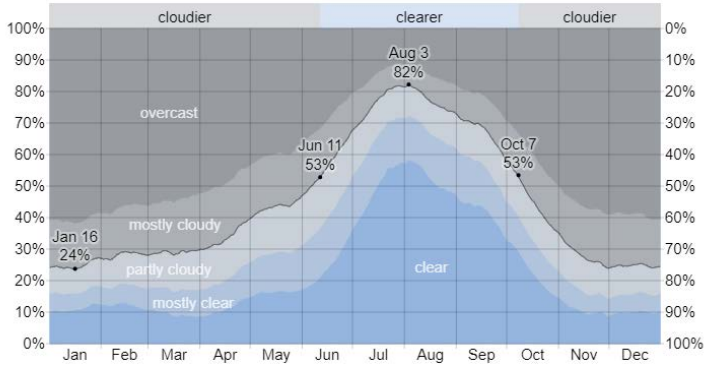
Source: www.weatherspark.com

FIGURE 2-5: ANNUAL RAINFALL



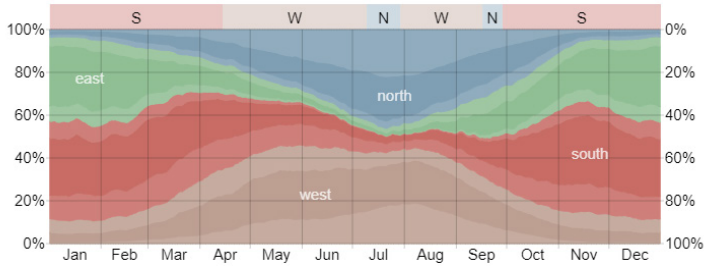
Source: www.weatherspark.com

FIGURE 2-6: ANNUAL CLOUD COVER



Source: www.weatherspark.com

FIGURE 2-7: ANNUAL WIND DATA



Source: www.weatherspark.com

ENVIRONMENTAL SCREENING/NEPA CATEGORIES

An environmental screening/desktop review of previous environmental work was included as part of the Airport Master Plan to provide a summary of the FAA prescribed environmental impact categories. Building off previous environmental work completed for the Airport, the desktop review referenced materials and site assessments completed for the Draft Environmental Assessment (EA) for Obstruction Removal.[12] The supporting field investigations for the EA include a biological assessment, water resources report, cultural resources, and air quality report. The documents included in the EA are currently under review by FAA and have been incorporated by reference into the environmental screening report provided in **Appendix 2**.

Typical environmental impact categories include:

- Air Quality;
- Biological Resources (including fish, wildlife, and plants);
- Federally-listed Endangered and Threatened ("T&E") Species;
- Climate;
- Coastal Resources;
- Department of Transportation Act, Section 4(f);
- Farmlands;
- Hazardous Materials, Solid Waste, and Pollution Prevention;
- Historical, Architectural, Archeological, and Cultural Resources;
- Land Use;
- Natural Resources and Energy Supply;
- Noise and Compatible Land Use
- Socioeconomics, Environmental Justice, and Children's Environmental Health and Safety Risks
- Visual Effects; and
- Water Resources (including wetlands, floodplains, surface waters, water quality, stormwater, groundwater, and wild and scenic rivers).

Several of the impact categories above (land use, climate, socioeconomic, etc.) are analyzed separately throughout Chapter 3 – Existing Conditions Analysis. Per the scope of work, not all impact categories identified above were included for analysis. A summary of significant findings is provided below.

Air Quality

The Aurora State Airport property falls within a census block where all air quality-related environmental hazard indexes are between the 24th and 73rd percentile nationwide. The Airport property scores within the 51st percentile for diesel particulate matter, the 73rd percentile for PM2.5 levels, the 24th percentile for ozone summer seasonal average of daily maximum eight-hour concentrations in the air, the 51st percentile for cancer risk from the inhalation of air toxics, and the 69th percentile nationwide for other respiratory hazards exposure.

Biological Resources

A review of available data yielded no records of species observed on the Airport listed by state, or federally as endangered or threatened, nor were any species listed as candidates for listing reported. However, the Molalla River (three miles northeast of the Airport), the Pudding River (0.85 mile east of the Airport), and Mill Creek (0.75 mile southeast of the Airport) are designated as habitat for Chinook salmon (federally threatened; state classified sensitive critical), Pacific lamprey (federal species of concern; state classified sensitive vulnerable), and steelhead (federally threatened; state classified sensitive vulnerable) based on records of historic sightings.

There are no designated critical habitats on the Airport property. However, sub-watersheds surrounding the Airport are considered Essential Fish Habitat (EFH) for Chinook and coho salmon. Federal agencies are required to consult with the National Oceanic and Atmospheric Administration (NOAA) Fisheries regarding any action authorized, funded, or undertaken that may adversely affect EFH. Stormwater runoff from the Airport property flows into the Chinook and steelhead critical habitat areas as well as the Chinook and coho EFH areas.

12 Aurora State Airport Master Plan Update Environmental Overview, December 2021, Environmental Science Associates

Hazardous Materials, Solid Waste and Pollution Prevention

An EPA hazardous waste treatment, storage, and disposal facility (TSDF) was reported at Columbia Helicopters Inc., adjacent to the Airport's northeast property boundary. This TSDF is recorded as addressing the handling and prevention of releases of hazardous materials into the environment from wastes generated on site at the property, as well as wastes received from off-site facilities. In addition to this TSDF, Columbia Helicopters Inc. also holds a National Pollutant Discharge Elimination System (NPDES) permit for water discharges and is identified by the EPA Cleanups in My Community Map as having been a Resource Conservation and Recovery Act (RCRA) corrective action site. Aurora State Airport also holds an NPDES permit (also referred to in Oregon as a 1200-Z Stormwater Discharge General Permit), as do 12 other properties within 12 miles of the Airport.

There is one aboveground storage tank fueling facility and one recently decommissioned fueling facility with underground storage tanks located on ODAV-owned property that are planned to be removed. There are also other privately-owned facilities surrounding the Airport property that have their own fueling facilities.

Natural Resources and Energy Supply

A Water Control District has been formed at the Airport to provide water for fire protection for properties at the Airport. Two wells are located on Airport property, in addition to a pumphouse and underground water storage tanks that provide water to fire hydrants across the Airport property.

Water testing has revealed the presence of arsenic above the maximum contamination level set by the EPA in wells located on and surrounding the Airport property. Mitigation measures in the form of pump and filtration systems were recommended to be implemented to provide adequate flow and water quality.

Water Resources

Wetlands

Several non-jurisdictional wetlands have been identified on Airport property. These wetlands were products of man-made drainage swales that are located in historic uplands with non-hydric soils. According to Oregon Department of State Lands Rule 141-085-0515 Removal-Fill Jurisdiction by Type of Water, these swales with wetland hydrology, vegetation, and soils are not considered waters of the state because they are artificially created for the purposes of stormwater detention and/or treatment.

Floodplains

The Airport property lies in a FEMA Zone X, which is considered an area of minimal flood hazard. The Airport is located outside of the 500-year floodplain. The closest 100-year floodplain is located approximately 0.55 miles east of the Airport and is associated with the Pudding River.

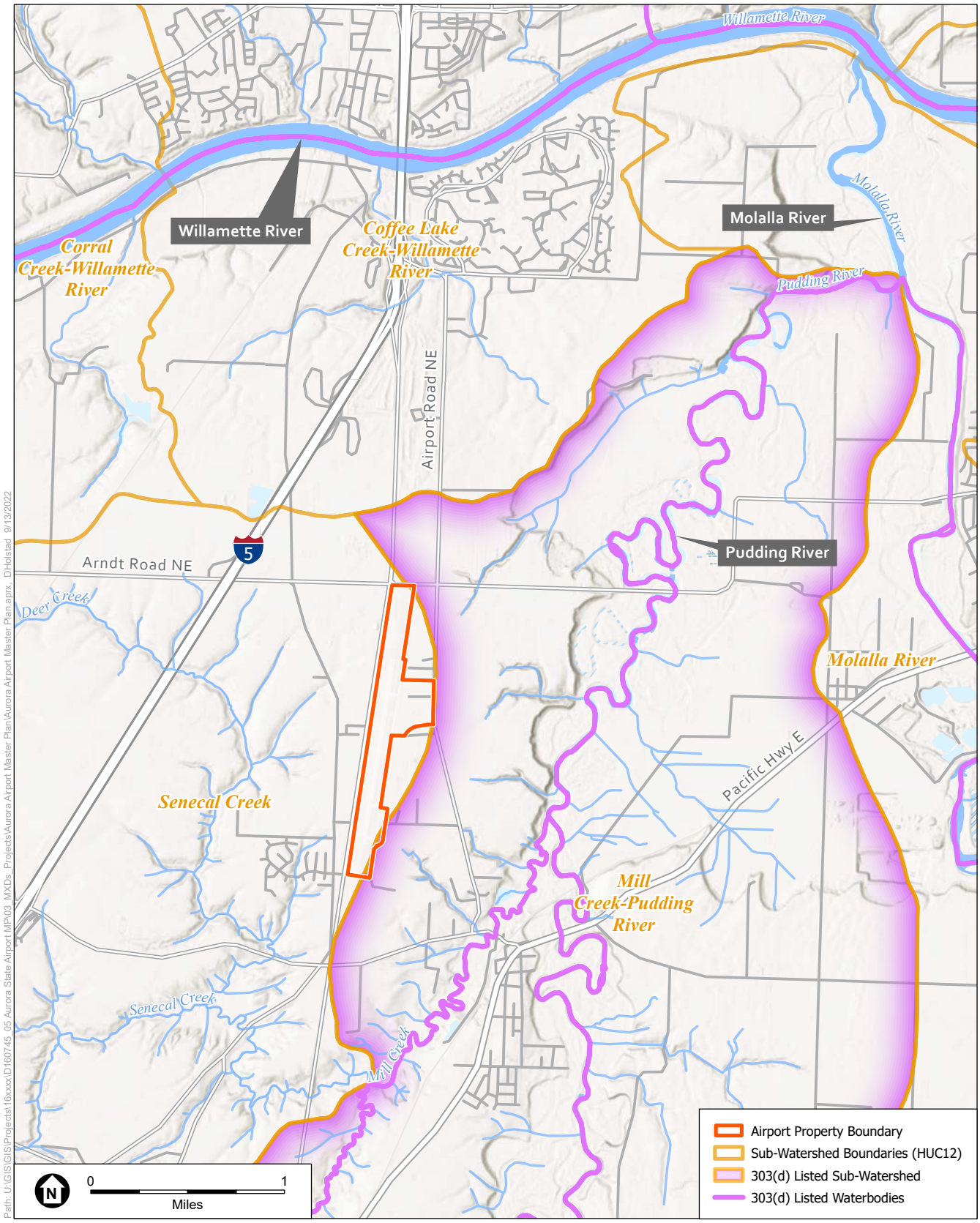
Water Quality

Many of the surface waters in the vicinity of the Aurora State Airport property are contaminated and listed on the DEQ 303(d) list. Contaminated surface waters in the vicinity of the Airport are depicted in **Figure 2-8** and listed below:

- A segment of the Pudding River east of the Airport is on the 303(d) list of impaired waterways for guthion, water temperatures, and dieldrin. It is impaired for fish and aquatic life, fishing, and public and private domestic water supplies.
- The entire Mill Creek-Pudding River sub-watershed (1st–4th order streams) is listed on the 303(d) list for benthic macroinvertebrates bioassessments and inorganic arsenic. It is considered impaired habitat for fish and aquatic life, fishing, public and private domestic water supplies, and recreational contact with the water.
- A segment of the Molalla River that intersects the Pudding River east of the Airport is not a 303(d)-listed waterway but is listed by the EPA's "How's My Waterway" tool as impaired for fishing due to flow regime modification.
- The segment of the Willamette River that the Molalla River flows into north of the Airport is also a 303(d)-listed waterway. It is listed for the following factors: noxious aquatic plants, aldrin, benthic macroinvertebrates bioassessments, temperatures, 4,4'-DDE, 4,4'DDT, dieldrin, and PCBs. It is considered impaired for aesthetic quality, boating, fish and aquatic life, fishing, and public and private domestic water supply.

Compromised waters in the vicinity of the Airport property include critical habitat for federally threatened Upper Willamette River Chinook and steelhead populations. These waters also flow downstream to additional critical habitat areas for other species of federally listed fish species in the Columbia River.

FIGURE 2-8: CONTAMINATED SURFACE WATERS IN VICINITY OF AURORA STATE AIRPORT



SOURCES - Basemap: ESRI; 303(d): DEQ, 2022.

D201600745.05

Socioeconomics, Environmental Justice, and Children's Environmental Health and Safety Risks

Local and regional socioeconomic data are presented previously in this chapter. Title VI of the US Civil Rights Act of 1964, as amended, EO 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, and Order DOT 5610.2, Environmental Justice require that no minority or low-income person shall be disproportionately adversely impacted by any project receiving federal funds. For transportation projects, this means that no particular minority or low-income person may be disproportionately isolated, displaced, or otherwise subjected to adverse effects. Potential impacts are assessed in terms of property acquisitions or relocations, changes in access to employment areas, and other changes in low-income and minority communities/neighborhoods. To determine whether an environmental justice population is present, Federal agencies must refer to U.S. Census data to establish the demographic and socio-economic baseline.

According to the Department of Transportation Order 1050.1F and Executive Order 13045, the FAA is directed to identify and assess environmental health risks and safety risks that the agency has reason to believe could disproportionately affect children. Environmental health risks and safety risks include risks to health or to safety that are attributable to products or substances that a child is likely to come into contact with or ingest, such as air, food, drinking water, recreational waters, soil, or products they might use or be exposed to. The closest schools to the airport are: North Marion Primary, Intermediate, Middle and Senior High School (2.0 miles southeast).

The FAA has not established significance thresholds for socioeconomics, environmental justice, or children's environmental health and safety risks.

Farmlands

The Farmland Protection Policy Act (FPPA) was passed under the Agriculture and Food Act of 1981 to minimize the impact that federal programs have on the unnecessary and irreversible conversion of farmland to nonagricultural uses. According to the FPPA, farmland is classified as either "prime farmland, unique farmland, or farmland of statewide or local importance." There are no farmlands located on ODAV-owned Airport property. Some of the private lands located adjacent to the Airport are zoned Exclusive Farm Use (EFU), as well as Residential, and Commercial, and publicly owned rights of way.

Natural Resources and Energy Supply

The Airport uses fuel to power aircraft, natural gas for heating, and electricity to power buildings and runway and taxiway lighting. Electricity is provided to the Airport by Portland General Electric. Airport water is well water and sewer service are septic systems. Natural gas is provided by NW Natural Gas.

Historical, Architectural, Archeological, and Cultural Resources

The archaeology survey identified no high-probability areas and no archaeological resources within the study area consisting of ODAV-owned property on the Airport. Four historic resources have been previously identified within the study area: Runway 17-35, a drainage ditch, and two wind cones. The historic resources were recommended to be not eligible for listing in the National Register of Historic Places (NRHP) in 2019.

The report recommended that individual projects proposed in association with the Master Plan should include a compliance-level cultural resource investigation. This includes documenting historic resources within the study area on one or more Section 106 Documentation Forms and determining their eligibility for listing in the NRHP in consultation with the Federal Aviation Administration and the Oregon State Historic Preservation Office (SHPO). Consultation with SHPO regarding the potential for a historic district at Aurora State Airport should be resumed. The most recent Cultural Resource Review and Archaeology Survey completed as part of the Airport Master Plan is included in **Appendix 3**.

LOCAL SURFACE TRANSPORTATION

The Airport is located between Interstate 5 and State Highway 99E. Interstate 5, which is an essential north-south commerce link for the western United States, runs west of the Airport providing access to the Portland metro area. 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. State Highway 99E, accessible to the Airport via Ehlen Road off of Highway 551 and Airport Road, provides access to the nearby communities of Canby, and Oregon City.

AREA LAND USE/ZONING

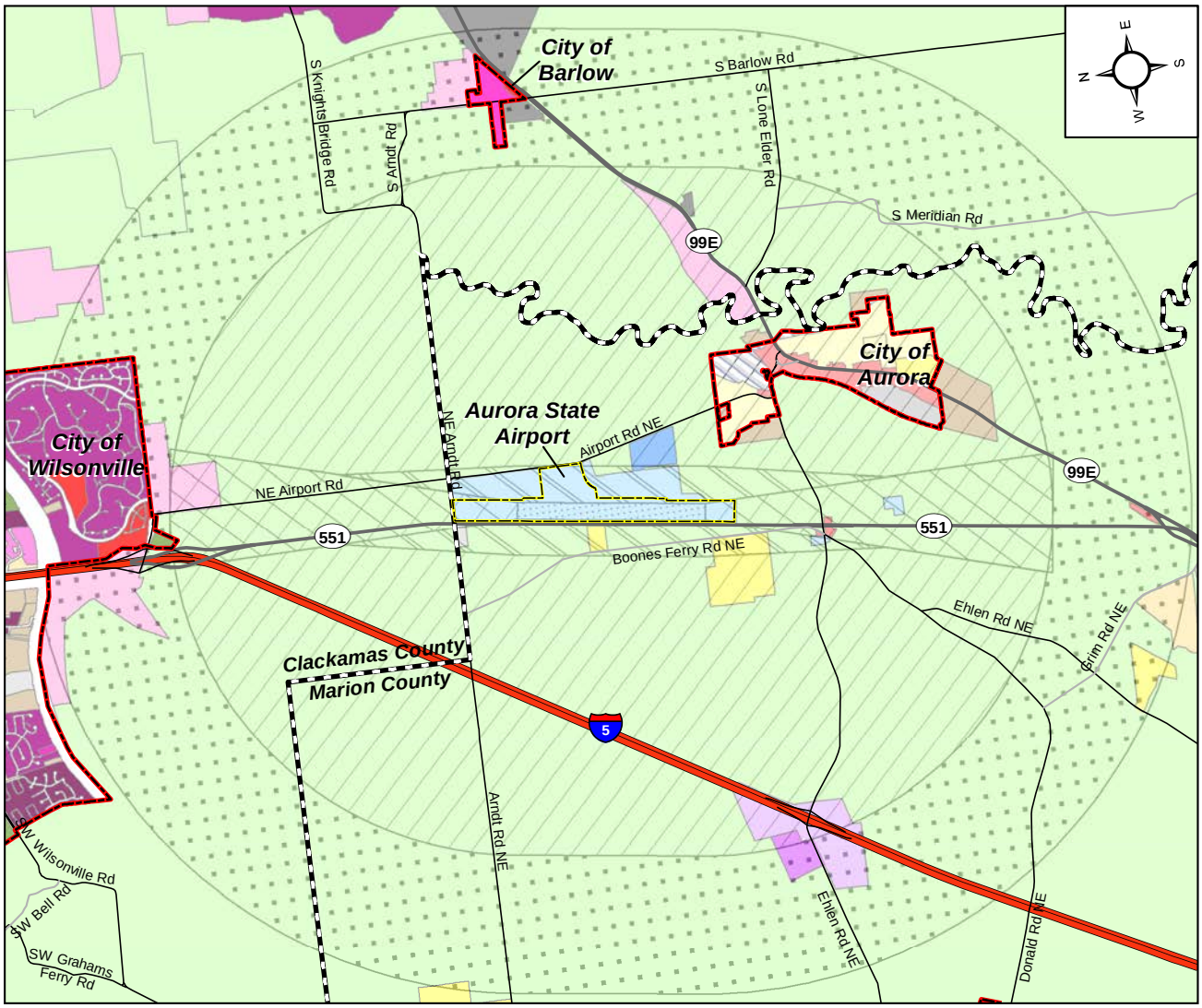
As depicted in **Figure 2-9**, the Airport is located outside of the Aurora UGB. Land use actions related to the airport property and its immediate surroundings are under the exclusive jurisdiction of Marion County. The applicable zoning ordinance articles associated with the Airport are summarized below and provided in full in **Appendix 4**.

The Airport's FAR Part 77 airspace extends over areas of Marion and Clackamas County, and the City of Aurora. Each of these jurisdictions is responsible for protecting the areas of airport airspace that fall within their boundaries, and each employs overlay zoning districts as a mechanism to do so. The overlay districts are discussed in more detail below.

Existing Airport Base Zone

The existing airport property is zoned as **Public (P)** as defined in Marion County Code 17.171. The intent of the P 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." Airports are regulated by Chapter 17.171, Section 030 - Conditional Uses, which states that "Airport and airport related commercial and industrial uses" are authorized under the procedure provided for conditional uses and are permitted in the P zone.

FIGURE 2-9: AREA SURFACE TRANSPORTATION AND ZONING MAP



Marion County Zoning[1]		Clackamas County and City of Wilsonville Zoning[2]			City of Aurora Zoning[3]	FAR Part 77 Overlay[4]
AR	ID-LU	CN	PF	SFR3	C	Primary Surface
C	P	EFU	RI	SFR5	FH	Appproach Surface
EFU	P-LU	FUD	RRFU	SFR7	I	Transitional Surface
I	RS	IC	SFR10		R1	Horizontal Surface
ID	UT-20	MFR1	SFR2		R2	Conical Surface

Note: The Cities of Wilsonville and Barlow have not adopted overlay zoning districts to protect FAR Part 77 airspace surfaces. The conical surface over these jurisdictions has been excluded.

Compiled by Century West Engineering from the following data sources:

[1] Marion County GIS Open Data (https://marioncounty.maps.arcgis.com)
[2] Metro RLIS Discovery (https://rlisdiscovery.oregonmetro.gov)
[3] City of Aurora Planning (https://www.ci.aurora.or.us/planning/page/zoning-maps)

Airport Vicinity Zoning/Land Use

The Airport is generally surrounded by Marion County **Exclusive Farm Use (EFU**) districts, and a few parcels of **Acreage Residential (AR)** and **Industrial (I)** located in the immediate vicinity of the property.

The intent of the EFU zone (Marion County Code 17.136) is to provide and preserve the continued practice of commercial agriculture. It is intended to be applied in areas composed of tracts that are predominantly high-value farm soils. EFU zone generally prohibits the construction, use, or design of buildings and structures except for facilities used in agricultural or forestry operations, replacing or restoring a lawfully established dwellings, supporting exploration of geothermal or mineral resources, or supporting agri-tourism destinations and events. EFU zone also permits the construction of public roads, establishment or enhancement of wetlands, and the operation of composting facilities.

The AR zone (Marion County Code 17.128) facilitates the division and development of property suitable for development of acreage homesites. Allowed uses include single-family dwellings, agricultural development, planned developments, public parks and recreation facilities, religious organization use (less than 20,000 square feet in area), or replacement of an existing lawfully established dwelling.

The I zone (Marion County Code 17.165) is intended to provide for the location of needed industrial uses which are not dependent upon urban services. The I zone encourages orderly and compatible development of industrial uses, including agricultural related industry, on rural lands. Permitted uses include agricultural services and forestry; contracting and service facilities; the processing and manufacture of various commercial products; coal and wood fuel dealers; fire stations, utility facilities, and dwellings intended for facility caretakers.

The closest City of Aurora zoning district to the airport is an area of **Low Density Residential (R-1)** located approximately one-third of a mile southeast of the property.

The LDR zone (Aurora Municipal Code 16.10) is intended to provide a minimum standard for residential uses in areas of low population density. The municipal code allows LDR zoned areas to be used for single-family dwellings, public support facilities, childcare facilities, residential home care, public parks and recreation areas, two-family dwellings, city-owned structures, accessory buildings including accessory dwelling units (ADU), and some agricultural buildings.

Marion County, Clackamas County, and the City of Aurora have adopted airport overlay zoning districts intended to enhance the protection of airport airspace, and compatible land use planning. The City of Wilsonville has not adopted an overlay zoning district.

The airport overlay zones based on FAR Part 77 imaginary surfaces, applicable within each jurisdictional boundary, are included in the following codes:

- Marion County Code (Chapter 17.177)
- Clackamas County Code (Chapter 713)
- City of Aurora Municipal Code (Chapter 16.24)

The language contained in the zoning codes addresses permitted and conditional uses within each of the designated overlay zones to address land use compatibilities and height restrictions intended to protect aircraft operating in the airspace, as well as persons and property on the ground. **Figure 2-9**, presented earlier, depicts the overlay zones based on Part 77 imaginary surfaces established for Aurora State Airport.

The Oregon Department of Aviation Land Use Compatibility Guidebook recommends guidance for determining land use compatibility with overlaying FAR Part 77 surfaces. The guidance suggests that areas of residential land use should not be located under primary, approach, or transitional surfaces. At Aurora State Airport, two areas of residential property are located beneath the west transitional surface and another area of residential use is located south of the Willamette River near the end of the Runway 17 approach surface. Additionally, while the above discussed Public zone lists airports as a conditional use for the zone, the Land Use Compatibility Guidebook recommends establishing an airport-specific zone for airport properties.

Airside Elements

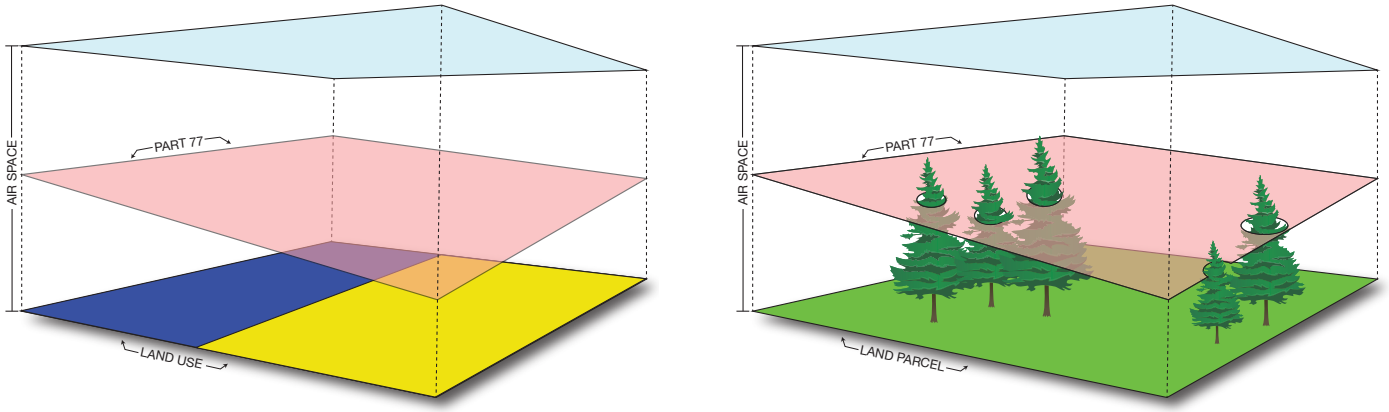
The Airside Elements (depicted in the existing conditions **Figure 2-13**) section is comprised of the facilities that facilitate the movement and operation of aircraft on the ground and in the air around Aurora State Airport. This section of the existing conditions analysis includes a discussion of the area airspace, instrument flight procedures, runways, taxiways/taxilanes, aprons/tiedowns/aircraft parking, airfield pavement condition, and airside support facilities.

AIRSPACE – PART 77, TERPS, AND RUNWAY END SITING SURFACES

In addition to the airspace classifications and operating environment with which pilots are more familiar with there are a variety of rules, regulations, design standards, and policies associated with the protection of airspace, evaluation of proposed objects on and near airports, and their effects on navigable airspace. Airport Cooperative Research Program (ACRP) Report 38 - *Understanding Airspace, Objects, and Their Effects on Airports* provides a comprehensive description of the regulations, standards, evaluation criteria, and processes designed to protect the airspace environments surrounding airports and is summarized below for additional context of airspace evaluation and design to serve Aurora State Airport.

14 CFR, Part 77 – Safe, Efficient Use, and Preservation of the Navigable Airspace

Part 77 defines airspace surfaces and obstruction standards for civil airports and establishes the central regulation governing airspace protection, with cross-references to many other criteria documents. It sets forth the requirements for notifying the FAA of proposed construction; defines obstruction criteria; and describes aeronautical studies required to assess hazard status. The Part 77 surfaces associated with Aurora State Airport have been codified by the local jurisdictions through airport overlay zones discussed above. **Figure 2-10** depicts the existing Part 77 airspace defined for Runway 17/35 at Aurora State Airport. The graphics below illustrate the relationship between an invisible airspace surface (these surfaces are also referred to as "imaginary" surfaces) defined in Part 77 and the underlying land use and objects.



Source: Century West Engineering

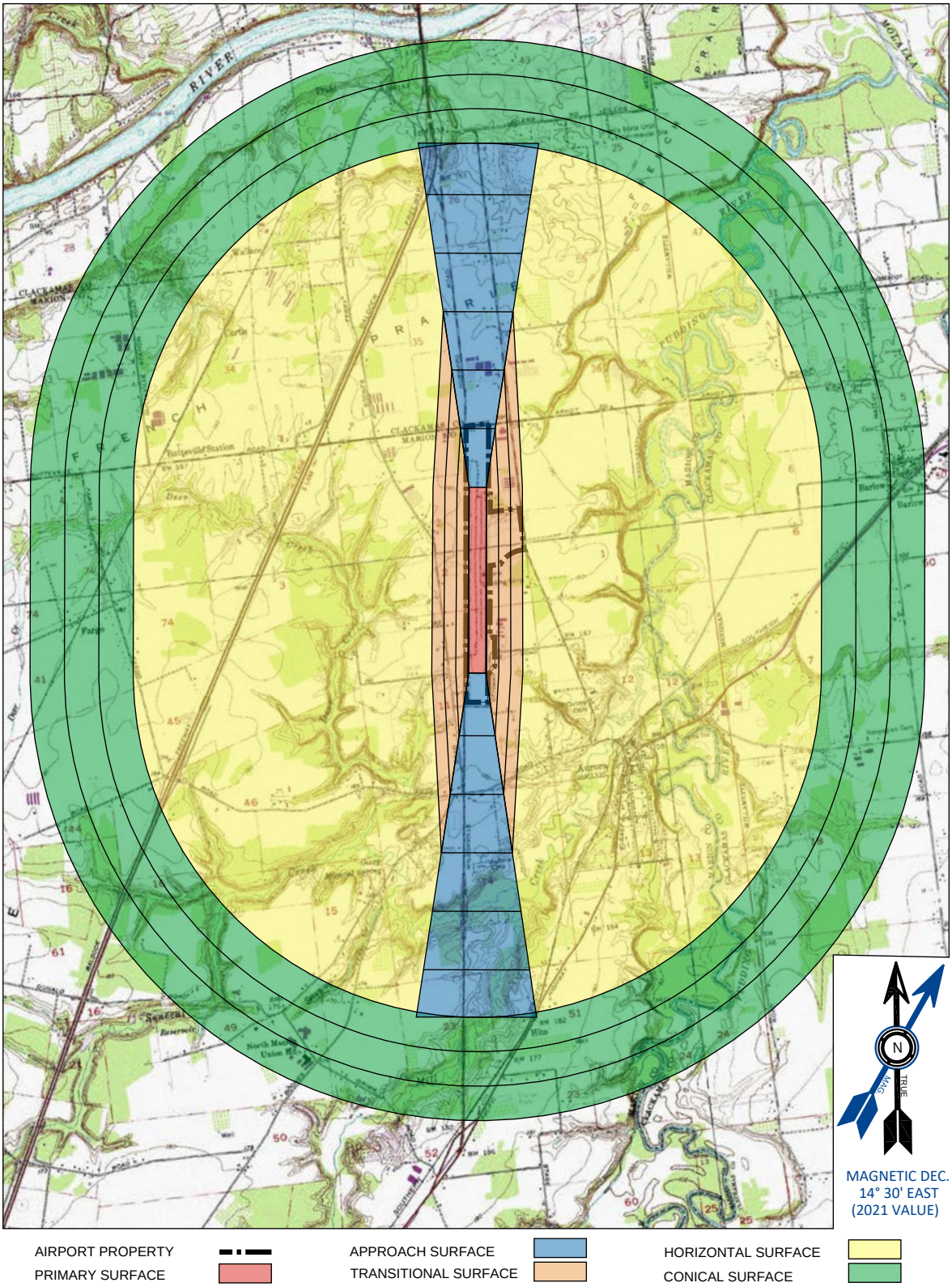
FAA Order 8260.3E – United States Standard for Terminal Instrument Procedures (TERPS)

This FAA Order, along with several derivative orders in the 8260 series and other related orders, define criteria that FAA flight procedure designers utilize when designing instrument flight procedures. Airspace protection requirements for instrument flight procedures are similar to those defined in Part 77, although they also define protected airspace requirements for instrument approach and departure routes connecting the terminal and enroute airspace. Obstruction mitigation (obstacles to protected airspace) defined in FAA aeronautical studies may be required for TERPS surfaces, in addition Part 77 surfaces.

FAA AC 150/5300-13B– Airport Design

This Advisory Circular (AC) is the principal document utilized by the FAA, airport sponsors, and consultants when planning and designing new airports or improvements to existing airports. Design criteria for addressing obstacle clearances for runway ends are defined in the AC's discussion of Runway End Siting Surfaces.

FIGURE 2-10: PART 77 AIRSPACE



For Aurora State Airport, the approach surfaces for the runway extend 10,000 feet beyond each runway (beginning 200 beyond the runway end).

Source: Century West Engineering

AIRSPACE CLASSIFICATIONS (Figure 2-11)

Airspace within the United States is classified by the FAA as "controlled" or "uncontrolled" with altitudes extending from the surface upward to 60,000 feet above mean sea level (MSL). Controlled airspace classifications include Class A, B, C, D, and E. Class G airspace is uncontrolled. Aircraft operating within controlled airspace are subject to varying levels of positive air traffic control that are unique to each airspace classification. Requirements to operate within controlled airspace vary, with the most stringent requirements associated with very large commercial airports in high traffic areas. Uncontrolled airspace is typically found in remote areas or is limited to a 700 or 1,200-foot above ground level (AGL) layer above the surface and below controlled airspace.

LOCAL AREA AIRSPACE STRUCTURE (Figure 2-12)

The Seattle Sectional Aeronautical Chart depicts nearby airports, notable obstructions, and special airspace designations in the vicinity of Aurora State Airport. Low-altitude instrument airways are also depicted for general reference because pilots use them for both visual and instrument flight planning. The blue airways are identified as "Victor" or Area Navigation ("T routes") airways.

Additional definition of the low altitude airways is provided on FAA IFR Enroute Low Altitude – U.S. Chart L-1.[13] The chart is used exclusively for instrument flight planning and provides additional detail for pilots. As is common in busy air traffic areas, Aurora State Airport is surrounded by low altitude instrument airways in all directions. However, the minimum flight altitudes assigned to the nearby airway segments are well above the traffic pattern altitude (1,200 feet above mean sea level; 1,000 feet above ground level) for the Airport, which avoids operational conflicts between local and enroute air traffic. The proximity of several instrument airways, combined with VFR activity generated by nearby airports causes overflights from aircraft not departing or arriving at Aurora State Airport.

The nearest low altitude enroute airways to Aurora State Airport pass along the west and south sides of the Airport. These airways connect to ground-based electronic navigational aids (very high frequency (VHF) transmitters) located in Newberg, Bend, Eugene, and Battleground, Washington.

The airspace designation surrounding Aurora State Airport is dependent on the operational status of the ATCT. When the ATCT is operating, the surrounding airspace is Class D from the surface up to 2,500 feet AGL and extends outward in a four-mile radius. Aircraft operating in Class D airspace are required to establish contact with the ATCT before entering Class D airspace. When the ATCT is not operating, Class E airspace is in effect, extending from the surface upward and pilots are responsible for monitoring the assigned Common Traffic Advisory Frequency (CTAF).

Special Use Airspace

Special Use Airspace (SUA) is airspace where activities are confined due to their nature or where limitations are placed on aircraft operations that are not part of those activities. SUAs also include warning areas, military operations areas (MOA), alert areas, controlled firing areas (CFA), and national security areas (NSA).

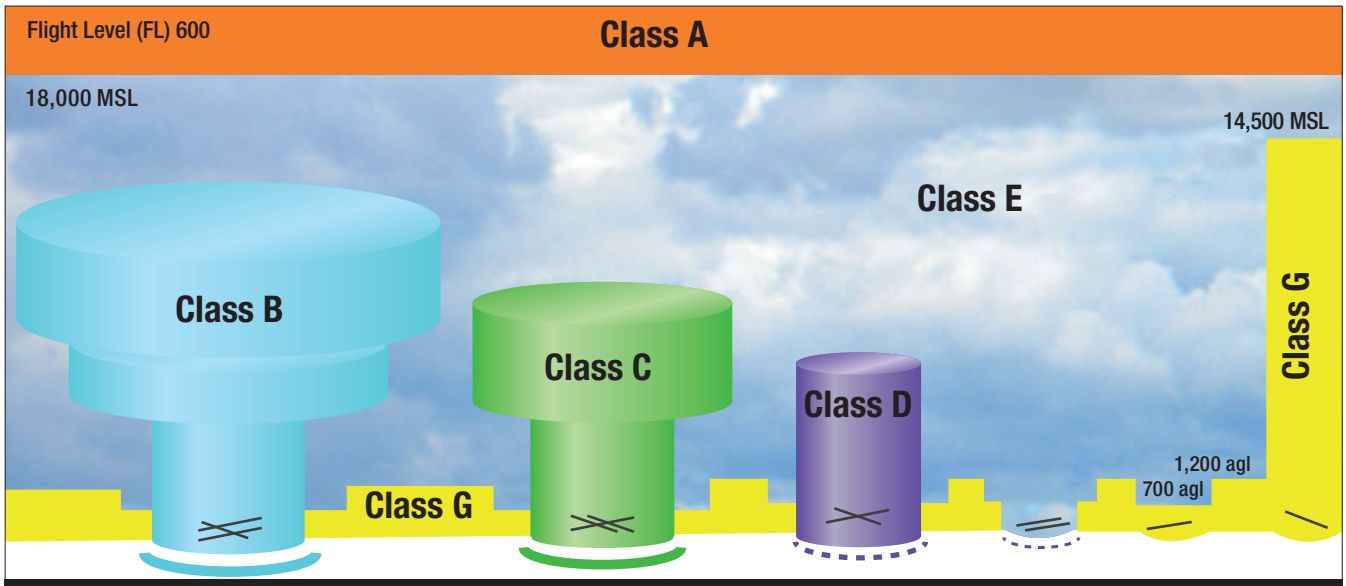
There are no SUAs in the immediate area of Aurora State Airport, with the closest example being the EEL C and EEL D MOAs located on the Oregon and Washington Coast.

Controlled and Uncontrolled Airspace

As mentioned previously, Aurora State Airport operates in controlled Class D airspace during the hours of ATCT operations. During these times pilots contact Aurora ATCT upon arrivals and departures. Outside of the hours of ATCT operations, the Airport operates as Class E airspace, at which times pilots use the CTAF for communications with ground facilities and other aircraft operating in the vicinity of the Airport.

13 United States Government Flight Information Publication

FIGURE 2-11: AIRSPACE CLASSIFICATIONS



COMMUNICATION REQUIREMENTS AND WEATHER MINIMUMS

	Class A	Class B	Class C	Class D	Class E	Class G
Airspace Class Definition	Generally airspace above 18,000 feet MSL up to and including FL 600.	Generally multi-layered airspace from the surface up to 10,000 feet MSL surrounding the nation's busiest airports	Generally airspace from the surface to 4,000 feet AGL surrounding towered airports with service by radar approach control	Generally airspace from the surface to 2,500 feet AGL surrounding towered airports	Generally controlled airspace that is not Class A, Class B, Class C, or Class D	Generally uncontrolled airspace that is not Class A, Class B, Class C, Class D, or Class E
Minimum Pilot Qualifications	Instrument Rating	Student*	Student*	Student*	Student*	Student*
Entry Requirements	IFR: ATC Clearance VFR: Operations Prohibited	ATC Clearance	IFR: ATC Clearance VFR: Two-Way Communication w/ ATC	IFR: ATC Clearance VFR: Two-Way Communication w/ ATC	IFR: ATC Clearance VFR: None	None
VFR Visibility Below 10,000 MSL**	N/A	3 Statute Miles	3 Statute Miles	3 Statute Miles	3 Statute Miles	Day: 1 Statute Mile Night: 3 Statute Miles
VFR Cloud Clearance Below 10,000 MSL***	N/A	Clear of Clouds	500 Below 1,000 Above 2,000 Horizontal	500 Below 1,000 Above 2,000 Horizontal	500 Below 1,000 Above 2,000 Horizontal	500 Below 1,000 Above 2,000 Horizontal***
VFR Visibility 10,000 MSL and Above**	N/A	3 Statute Miles	3 Statute Miles	3 Statute Miles	5 Statute Miles	5 Statute Miles
VFR Cloud Clearance 10,000 MSL and Above	N/A	Clear of Clouds	500 Below 1,000 Above 2,000 Horizontal	500 Below 1,000 Above 2,000 Horizontal	1,000 Below 1,000 Above 1 Statute Mile Horizontal	1,000 Below 1,000 Above 1 Statute Mile Horizontal

* Prior to operating within Class B, C, or D airspace (or Class E airspace with an operating control tower), student, sport, and recreational pilots must meet the applicable FAR Part 61 training and endorsement requirements. Solo student, sport, and recreational pilot operations are prohibited at those airports listed in FAR Part 91, appendix D, section 4.

** Student pilot operations require at least 3 statute miles visibility during the day and 5 statute miles visibility at night.

*** Class G VFR cloud clearance at 1,200 agl and below (day); clear of clouds.

Source: Century West Engineering

FIGURE 2-12: AREA AIRSPACE – SEATTLE SECTIONAL CHART

LEGEND			
	Airports with other than hard-surface runways		Compass Rose (VOR/DME or VORTAC)
	Airports with hard-surfaced runways 1,500 ft. to 8,069 ft.		Enroute Airways
	Airports with hard-surfaced runways greater than 8,069 ft. or some multiple runways less than 8069 ft.		Class D Airspace (surface)
			Class E Airspace with floor 700' above surface
	VOR/ VORTAC		National Wilderness Area

Source: SkyVector.com

INSTRUMENT FLIGHT PROCEDURES

Instrument approach and departure procedures are developed by the FAA using electronic navigational aids and satellite navigation (SATNAV) to guide aircraft through a series of prescribed maneuvers in and out of an airport's terminal airspace. The procedures are designed to enable continued airport operation during instrument meteorological conditions (IMC), but are also used during visual conditions, particularly in conjunction with an instrument flight plan. The capabilities of each instrument approach are defined by the technical performance of the procedure platform (ground based navigational aids or satellite navigational aids) and the presence of nearby obstructions, which may affect the cloud ceiling and visibility minimums for the approach, and the routing for both the approach and missed approach procedure segments. The aircraft approach speed and corresponding descent rate may also affect approach minimums for different types of aircraft.

Aurora State Airport currently has three instrument approaches, two global positioning system (GPS) approaches to Runways 17 and 35, and a single localizer (LOC) approach to Runway 17. LOC RWY 17 approach presents separate minimums for approaching aircraft that are equipped to obtain a fix on FIDOV intersection. The GPS approaches provide vertical guidance to approaching aircraft. All published approach procedures provide electronic course guidance to either runway end and are authorized for category A-D aircraft (varying aircraft approach speeds) with approach minimums for both straight-in and circling procedures. Approach minimums are for each procedure are summarized in **Table 2-13** and the approach plates are provided in **Appendix 5**.

TABLE 2-13: INSTRUMENT APPROACH PROCEDURES – AURORA STATE AIRPORT

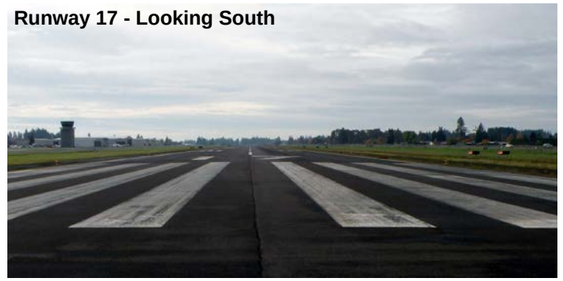
	MINIMUM ALTITUDE (MSL)	MINIMUM VISIBILITY (SM)	AIRCRAFT CATEGORY
RNAV (GPS) RWY 17			
LPV DA	511	7/8	A,B,C,D
LNAV/VNAV MDA	661	1 1/4	A,B,C,D
LNAV MDA	660	1	A,B
	660	1 1/8	C,D
Circling	700	1	A,B
	700	1 1/2	C
	940	2 1/4	D
RNAV (GPS) RWY 35			
LPV DA	453	7/8	A,B,C,D
LNAV/VNAV MDA	515	1	A,B,C,D
LNAV MDA	620	1	A,B
	620	1 1/4	C,D
Circling	700	1	A,B
	700	1 1/2	C
	940	2 1/4	D
LOC RWY 17			
S-17	1000	3/4*	A
	1000	1	B
	1000	2	C,D
Circling	1000	1	A
	1000	1 1/4	B
	1000	2 1/2	C,D
LOC RWY 17 (FIDOV FIX)			
S-17	580	3/4*	A,B
	580	1	C,D
Circling	700	1	A,B
	700	1 1/2	C
	940	2 1/4	D

Source: Federal Aviation Administration
* Visibility minimums increased to 7/8-mile via NOTAM 1/5229

There are three departure procedures published for the Airport. GLARA TWO instructs aircraft departing from Runway 17 to climb to 1,000 feet then make a climbing left turn direct to GLARA, crossing at 4,000 feet, and aircraft departing Runway 35 to climb to 700 feet then make a climbing right turn to GLARA, also crossing at 4000 feet. GNNET TWO instructs aircraft departing from Runway 17 to climb to 1,000 feet then make a climbing right turn direct to GNNET, crossing at 5,000 feet, and aircraft departing Runway 35 to climb to 700 feet then make a climbing left turn to GLARA, crossing at 5,000 feet. NEWBERG TWO directs aircraft departing from Runway 17 to climb to 1000 feet then make a climbing right turn direct to the URG VOR/ DME and aircraft departing Runway 35 to climb to 700 feet then make a climbing left turn to URG VOR/DME, then traffic from either runway should continue climb in URG VOR/DME holding pattern to cross the waypoint at or above 4,000 feet before proceeding on course. Copies of the departure procedure plates are available in **Appendix 5**.

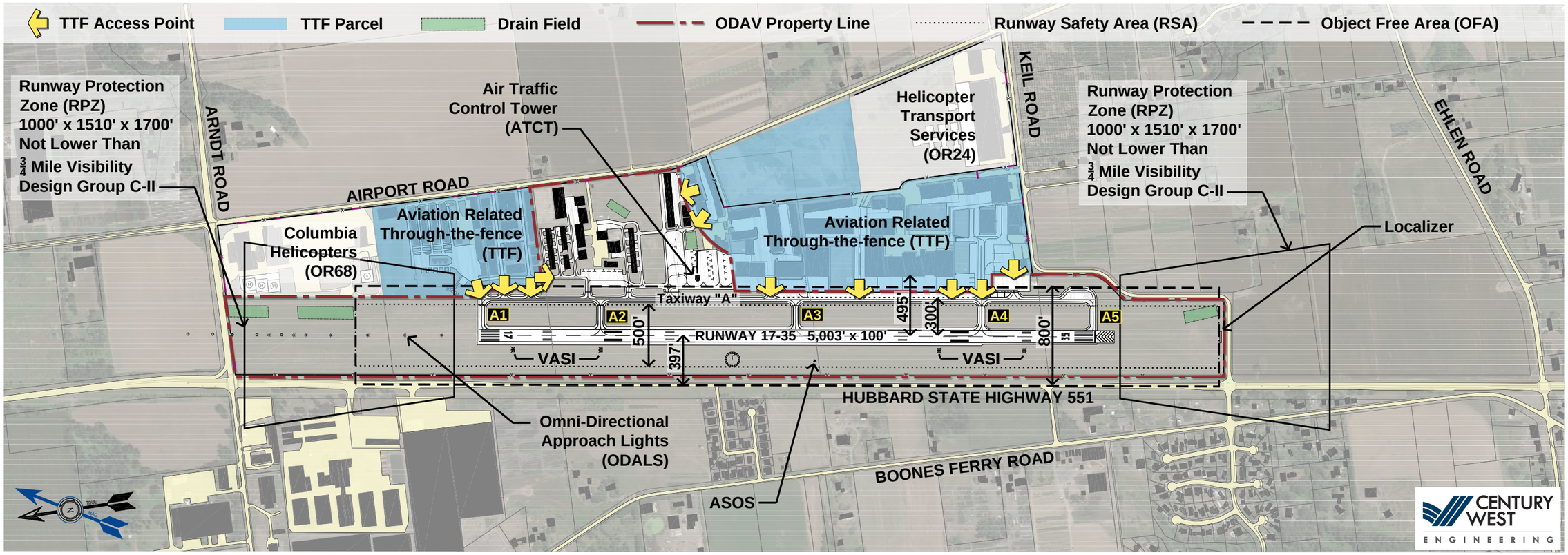
FIGURE 2-13
EXISTING CONDITIONS

Taxiway "A"


Runway 17 - Looking South

Air Traffic Control Tower (ATCT)

Atlantic Aviation Fuel Tanks - Leased ODAV Property



Hangars on ODAV Property

Hubbard Highway at Arndt Road

Piper Road at Hubbard Highway

Runway Distance Markers and VASI

RUNWAY

Runway 17/35 is 5,003 feet[14] long and 100 feet wide and is oriented in a north-south direction (187°/007° true bearing). Both runway ends employ left-hand traffic patterns with a traffic pattern altitude of 1,200 feet MSL. The runway is lighted and has a full-length parallel taxiway. The runway slopes downward from the 17 end (elevation 199.7 feet MSL) to the 35 end (elevation 196.3 feet MSL) resulting in an effective runway gradient of 0.06%.

The current runway pavement is comprised of two main sections. The largest being the 4,100-foot northern portion which was originally constructed in 1943. The southern 900 feet of the runway was constructed as an extension in 1993. The most recent runway paving work was a 2- to 3-inch asphalt overlay for the entire runway length, completed in 2005. The runway surface is grooved asphalt with a published single-wheel gear strength rating of 30,000 pounds and a dual-wheel gear strength rating of 45,000 pounds.

The runway has precision markings on each end to accommodate vertical guidance associated with the LPV[15] minimums. Precision markings include threshold bars, edge and centerline striping, aiming point markings, and touchdown zone markings, and runway designation markings. The markings were observed in good condition during a recent field visit to the facility. All markings are consistent with FAA standards.

Runway 35 Looking North – Source: Century West Engineering

TAXIWAYS AND TAXILANES

Runway 17/35 has a full length, 35-foot wide parallel taxiway (Taxiway A) that is offset 300 feet east of the runway (centerline to centerline). Taxiway A has five 90-degree connector taxiways accessing the runway (A1 – A5). The numbered taxiway connectors begin at the Runway 17 end (A1) and end at the Runway 35 end (A5). There are also 10 taxilane connections on Taxiway A that provide access to apron and hangar areas for three defined GA landside areas at the Airport. These include:

- Northern TTF Area;
- ODAV Terminal Area near the center of the airfield; and
- Southern TTF Area.

Additional taxilanes are located in and around hangar areas. Taxiway A and connector taxiways are equipped with blue medium intensity edge lights and yellow markings. Taxiway pavement conditions range from “Good” to “Poor” according to the ODAV’s 2018 Pavement Evaluation Program (PEP) report (**Appendix 6**). Pavement condition is discussed in more detail in the Pavement Condition section below.

APRONS AND TIEDOWNS

Within the ODAV-owned property, there is a total of 316,434 square feet of apron space available, primarily on two apron areas. The largest terminal apron area is located at the center of the property east of Taxiway A, adjacent to the ATCT and measures 143,546 square feet. A smaller aircraft parking apron is located near the northern end of ODAV landside property at Taxiway A and Taxiway A2. This apron space is used primarily by Aurora Flight Training. The remaining apron area is on the south end of the airport adjacent to Atlantic Aviation.

14 Runway lengths are rounded to the nearest foot, the 2022 AGIS survey measured the runway length as 5,003.3 feet.
15 LPV = “Localizer Performance with Vertical guidance.” Satellite-based instrument approach procedure

The ODAV-owned airport property has a total of 34 tiedown locations. Of the 34 tiedowns, 27 are located near the ATCT, including two configured as pull-through parking intended for large business aircraft. The remaining 25 tiedowns on the main apron are configured for small aircraft. The smaller north apron has seven tiedown locations for small aircraft. Neighboring tenants with airport TTF agreements also provide additional apron space and aircraft parking on their privately-owned land parcels.

Taxiway A Looking South – Source: Century West Engineering

Apron Looking East – Source: Century West Engineering

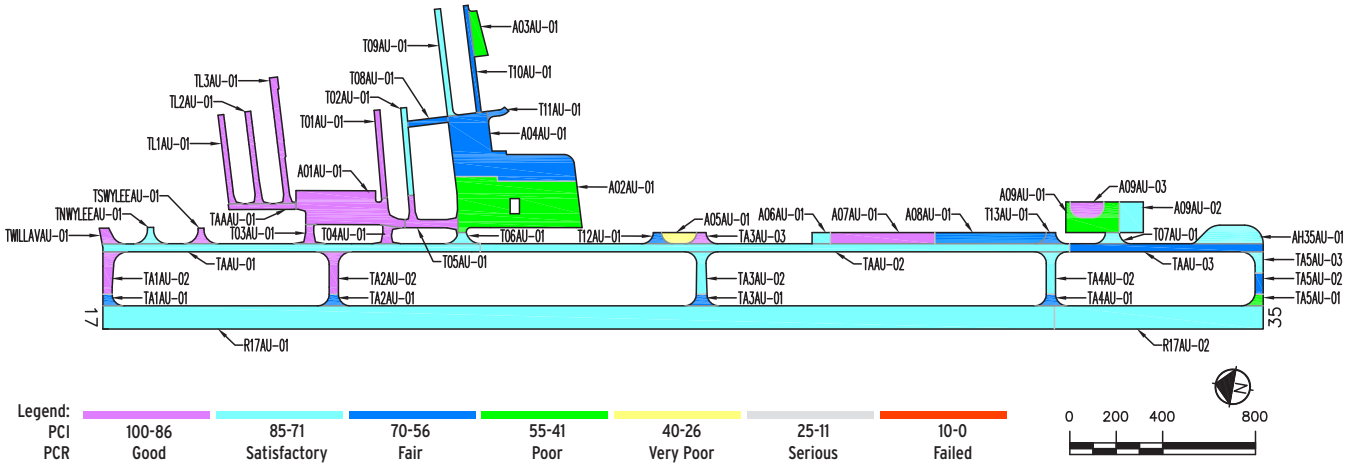
AIRFIELD PAVEMENT CONDITION

The ODAV Pavement Evaluation Program (PEP) systematically evaluates surface conditions, and identifies maintenance, repair, and rehabilitation projects needed to sustain functional pavements at Oregon public use airports. The PEP provides a thorough "snapshot in time" evaluation of surface conditions and provides projections of future surface condition for all eligible pavements in terms of pavement condition index (PCI). The PCI rating scale of 0 to 100 (failed to good) is used to assess pavement condition. For NPIAS airports like Aurora State Airport that receive federal funding, the PEP report is a critical tool for prioritizing airfield pavement needs and meeting FAA grant assurances.

PCI evaluations were performed as part of the PEP at Aurora State Airport in July 2018. The PEP was performed using the PCI methodology developed by the U.S. Army Corps of Engineers and outlined in the current edition of ASTM D-5340, Standard Test Method for Airport Condition Index Surveys. The 2018 PEP report for the Aurora State Airport is included in **Appendix 6**. The PEP assessments for Aurora State Airport are limited to ODAV-owned aeronautical pavements and do not include privately-owned (TTF) pavements located off airport property.

The PEP results (**Figure 2-14**) show that the runway pavement surface was in "satisfactory" condition with a weighted average PCI of 81 at that time. The primary distresses present on the runway were low- to medium-severity longitudinal cracking, low-severity weathering, and isolated low-severity alligator cracking. The longitudinal cracking was located primarily at paving joints created during the 2005 overlay project and sealed most recently in August of 2020. The alligator cracking was located primarily in areas aligning with the gear paths for typical business jet aircraft using the airport.

FIGURE 2-14: PAVEMENT CONDITIONS (2018 INSPECTION)



Source: 2018 ODAV Pavement Evaluation/Maintenance Management Program

Most of the taxiway pavements were rated “Satisfactory” or “Good.” Notable exceptions being the south 900 feet of Taxiway A and west fillets of connector taxiways A1 – A4, which received ratings of “Fair,” and the west fillet of connector taxiway A5 that was rated as “Poor.” The Taxilanes accessing hangar areas were rated as “Good” to “Fair.”

The apron pavements conditions were more varied. The west half of the main apron was rated as “Poor”, the east half was rated as “Fair,” and the north parking apron received a rating of “Good.” Most of the remaining apron pavements were rated as “Fair” or better. However, there was a single small area of apron located north of A3 between two access taxilanes rated “Very Poor.”

The 2018 PEP report recommended a variety of treatments to address the findings of the inspection, ranging from crack and slurry sealing to asphalt overlays and pavement reconstruction. The recommended treatment projects will be completed according to priority and funding availability, and ultimately included in the airport master plan’s capital improvement program (CIP).

In August of 2019, the ODAV commissioned GRI to conducted a Runway 17/35 pavement evaluation (included in **Appendix 6**) to determine the existing Pavement Classification Number (PCN). PCN is an International Civil Aviation Organization (ICAO) standard used to indicate the strength of a runway, taxiway or apron. That assessment included review of ODAV historical pavement records, falling weight deflectometer testing, pavement cores, and related analysis. The guidance provided in FAA Advisory Circular 150/5335-5C, Standardized Method of Reporting Airport Pavement Strength – PCN, was used to calculate the final PCN.

The results of the evaluation suggested that based on calculated PCN, individual operations of up to 102,000 pounds for single-wheel and 143,000 pounds for dual-wheel could theoretically be accommodated. The evaluation hypothesized that a higher than expected PCN number for these isolated operations may have resulted from additional structural capacity added by the 2005 overlay. Conversely, the study also identified low-severity top-down alligator cracking and delamination of the top layer of pavement within the gear paths that would limit the ability of larger aircraft to use the runway. This type of cracking and delamination results from shear stresses at the pavement surface from aircraft wheel loading during landing and hard braking. These shear stresses are greater when larger aircraft with larger tire contact patches are in use, potentially resulting in catastrophic runway pavement damage if operations of larger aircraft were allowed.

Century West Engineering produced an additional memorandum for ODAV in September of 2020 that summarized the findings of the GRI pavement evaluation. The memorandum, entitled “Runway Pavement Considerations for Overweight Landings” (included in **Appendix 6**), also provided recommendations on evaluation of future requests by operators of aircraft exceeding the published Runway 17/35 weight limitations. The memorandum recommended that cumulative operations and their effects on pavement structural life be considered when operations exceeding weight limitations are requested. Since PCN is a measure only of whether individual operations may cause pavement failure, analysis that includes changes in overall fleet mix should be conducted for any reoccurring overweight operations. Also, the memorandum discussed pavement surface distresses and overlay delamination that were noted (and discussed above) that should be carefully considered as an indicator of increased chance of catastrophic pavement failure in the affected areas due to overweight landings and takeoffs. More frequent pavement inspections in areas of concern were also recommended. Finally, the memorandum provided recommendations on response planning should a pavement failure occur.

In May of 2021, GRI completed one additional evaluation for the ODAV that examined the remaining structural life of the Runway 17/35 pavement (included in **Appendix 6**). This evaluation calculated the remaining structural pavement life under a variety of fleet mix scenarios including the existing fleet mix and with the addition of varying numbers of overweight aircraft operations. The assessment concluded that repeated stresses put on the Runway by overweight aircraft would likely result in further damage, a shortened structural life of the pavement, and increased the likelihood of a catastrophic pavement failure. GRI also recommended a rehabilitation of the existing Runway pavement within the next 10 years due to the distresses noted previously.

FAA DESIGN STANDARDS

The FAA defines several recommended standards for airport design in *AC 150/5300-13B, Airport Design*. Some of the most critical standards are those related to the design of runways and taxiways and will be described in more detail in subsequent chapters of this planning study. At this stage of the planning process, it is relevant to summarize existing non-standard conditions previously identified by the FAA for consideration throughout the planning process.

Runway Safety Area (RSA) – The RSA is a defined surface surrounding the runway that is prepared or suitable for reducing the risk of damage to airplanes in the event of an airplane undershoot, overshoot, or an excursion from the runway.

Object Free Area (OFA) –The OFA is an area on the ground centered on the runway, taxiway, or taxilane 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.

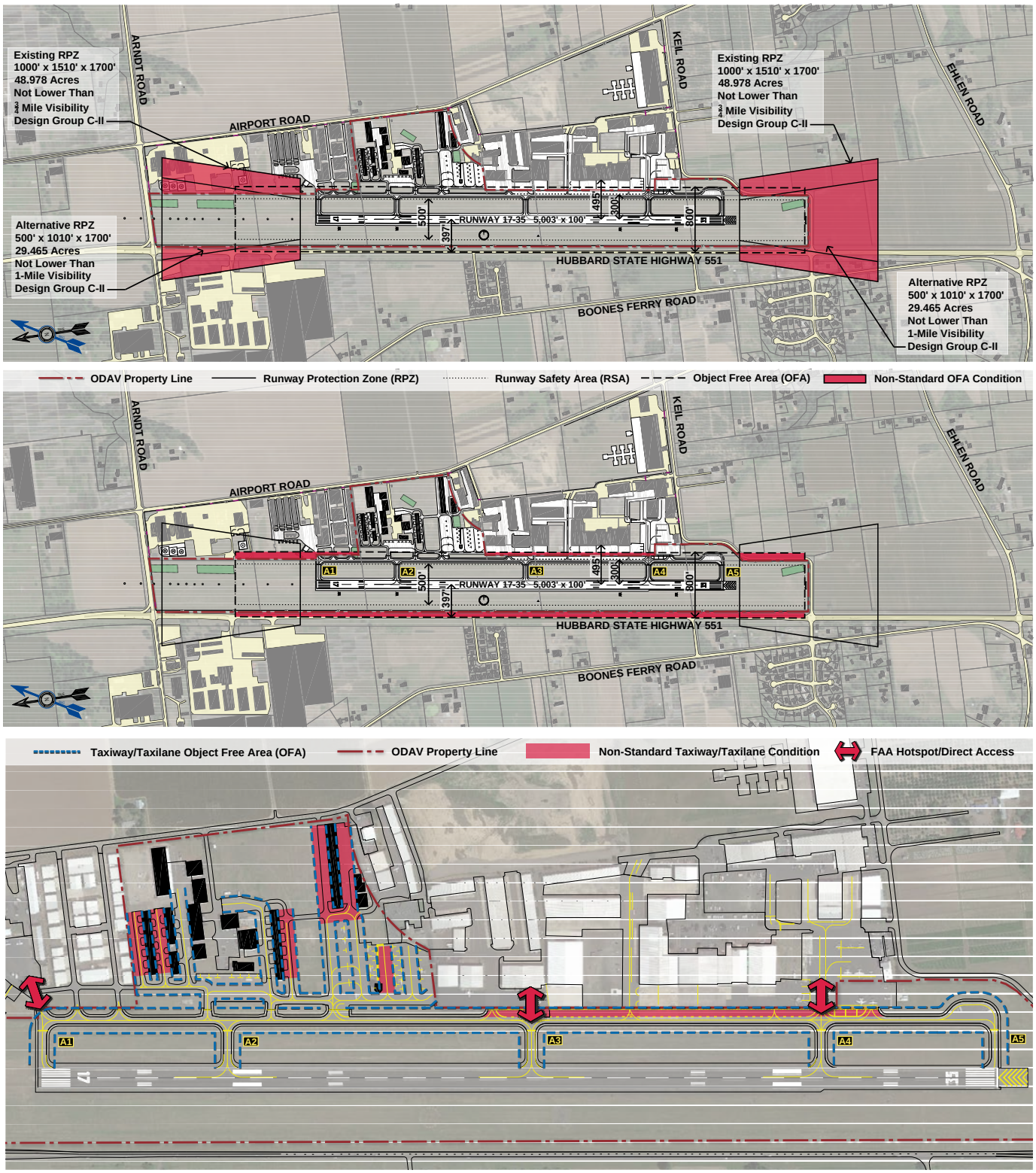
Obstacle Free Zone (OFZ) – The OFZ is a volume of airspace that is required to be clear of obstacles (including holding aircraft), except for frangible items required for the navigation of aircraft. It is centered along the runway and extended runway centerline.

Runway Protection Zone (RPZ) – The Runway Protection Zone (RPZ) is a trapezoidal area off each runway end intended to enhance the protection of people and property on the ground. The dimensions of an RPZ are a function of the critical aircraft and approach visibility minimums. The FAA recommends that RPZs be clear of all residences and places of public assembly (churches, schools, hospitals, etc.) and that airports own the land within the RPZs.

At Aurora State Airport, there are several known existing non-standard conditions to be analyzed in detail in the Facility Goals and Requirements and Development Alternatives Chapters. The following non-standard conditions are depicted in **Figure 2-15**:

- RPZs are encroached by various public roadways and contain properties that are not directly controlled by the Airport. “Interim Guidance on Land Uses Within Runway Protection Zone (2012)” generally identifies a public roadway as an incompatible land use within the RPZ. It also states that it is preferred that all property within RPZs be held by the airport in fee simple so the Airport sponsor can completely control the land use within.
- The runway OFA along its entire length is obstructed by Hubbard State Highway 551.
- There are several taxiway/taxilane design standard issues that should also be addressed at the Airport. The FAA recommends that taxiways/taxilanes not lead directly from an apron to the runway without requiring a turn. There are two direct runway access points on the Airport at Taxiways A3 and A4.
- The intersection of Taxiway A at A4 has been designated as a hotspot by the FAA. A hot spot is defined as a location on an airport movement area with a history or potential risk of collision or runway incursion, and where heightened attention by pilots and drivers is necessary.

FIGURE 2-15: NON-STANDARD CONDITIONS



Source: Century West Engineering

AIRPORT SUPPORT SERVICES

Support facilities generally include airside support facilities such as airfield lighting, signage, weather reporting equipment, ground-based navigational aids (NAVAIDS), and fueling facilities.

Air Traffic Control Tower

Aurora State Airport has an FAA Contract Air Traffic Control Tower (ATCT) on the main apron. Contract towers are ATCTs that are staffed by employees of private companies rather than by FAA employees. The ATCT was constructed in 2015 and began operations in October of that year. The tower is in operation daily between 0700 and 2000 local time (7:00 am to 8:00 pm in standard time terms).

Runway/Taxiway Lighting

Airfield edge lighting is classified as low, medium, or high intensity systems. Aurora State Airport's runway has a medium intensity runway lighting (MIRL) which are white in color. The parallel taxiway and connector taxiways have medium intensity taxiway lighting (MITL) which are blue in color. Both systems are pilot-activated by keying the microphone from their aircraft. Apron edges are marked by blue edge reflectors.

Airfield Lighting

The Airport accommodates day and night operations in visual and instrument meteorological conditions. The runway is equipped with lighting systems that meet the standards for the current instrument approach requirements and runway use.

Exterior building and pole-mounted overhead lighting is installed at various locations around the airfield in some parking lots and on airport buildings.

The airfield lighting was observed to be in good working condition and fully operational during recent site visits.

Airfield Signage

The runway-taxiway system has lighted mandatory instruction signs (red background with white text) marking the aircraft holding positions at each of the taxiway connections with the runway [17-35, 17, 35, etc.]; the signs also include taxiway direction/designations [A1, A2, etc.] with yellow background and black numbers/letters. The signs are located to coincide with the painted aircraft hold lines on each taxiway that connects to the runway.

Taxiway Light and Air Traffic Control Tower

Willamette Aviation Fuel Tanks

Medium Intensity Runway Lighting (MIRL)

Source: Century West Engineering

Weather Reporting

Aurora State Airport has an Automated Surface Observation System (ASOS) that provides 24-hour weather information. The ASOS sensor array is located west of the runway, near midfield. The system reports the following readings:

VASI and Windsock

Source: Century West Engineering

- Sky conditions such as cloud height and cloud coverage up to 12,000 feet;
- Surface visibility up to at least 10 statute miles;
- Basic present weather information such as the type and intensity for rain, snow, and freezing rain;
- Obstructions to vision like fog, haze, and/or dust;
- Sea-level pressure and altimeter settings;
- Air and dew point temperatures;
- Wind direction, speed and character (gusts, squalls);
- Precipitation accumulation; and
- Selected significant remarks including variable cloud height, variable visibility, precipitation beginning/ending times, rapid pressure changes, pressure change tendency, wind shift, peak wind.

When the ATCT is operating, weather reports are broadcast via the Automated Terminal Information System (ATIS). ATIS reports weather conditions and other information relevant to the airport hourly at 55 minutes past the hour on frequency 118.525 MHz. When the ATCT is not in service, the system reverts to the default ASOS information broadcast on the same frequency. The ASOS weather information is also available by telephone (503) 678-3011.

NAVAIDs

Navigational Aids (NAVAIDS) provide navigational assistance to approaching aircraft. They are classified as either Visual or Electronic. Visual NAVAIDs provide visual cues to pilots, usually through lights. Electronic NAVAIDs aid the pilot on approach by interacting with electronic instruments onboard the aircraft.

Visual NAVAIDs

Aurora State Airport has four types of visual NAVAIDs:

Visual Approach Slope Indicators (VASI). Two-box VASIs are located at both runway ends. VASIs give pilots visual cues regarding their angle of final approach by displaying different colored lights based on where they are in relation to the published glide slope angle. The Runway 17 VASI has a 3.5-degree glide path; the Runway 35 VASI has a 3.0-degree glide path. VASIs allow a limited range of adjustment above the standard 3.0-degree glide path angle to increase clearance over close-in obstructions to the runway approach.

Omnidirectional Approach Lighting System (ODALS). Runway 17 is equipped with an ODALS. ODALSs are normally associated with runways with published instrument approach procedures. They consist of a series of lights extending out from the runway end flashing in sequence guiding the aircraft to the runway end.

Airport Rotating Beacon (APBN). APBNs are used to indicate the location of an airport to pilots in darkness or during reduced visibility. For land airports, the APBN provides sequenced white and green flashing lights that rotate 360-degrees to allow pilots to identify the airport from all directions, from several miles. The beacon operates on a dusk-dawn photocell automatic switch and reportedly functions normally.

Electronic NAVAIDs

Localizer (LOC) with Distance Measuring Equipment (DME). The LOC and DME work in conjunction to provide lateral course guidance and distance information to aircraft on approach to Runway 17.

Newberg (URG) Very High Frequency Omnidirectional Range with DME (VOR/DME). The NAVAID is located 10.8 miles northwest of the Airport and supports nearby enroute navigational routes and instrument procedures to several airports in the area. Nine separate instrument airways converge in the area surrounding Aurora State Airport. Air traffic on these airways includes aircraft from throughout the instrument enroute system, including aircraft operating at airports throughout the region and aircraft that are simply transiting the area enroute to more distant airports.

FBO and Flight Training Services

There are two businesses offering fixed base operator (FBO) services at the Airport. Atlantic Aviation (formerly Lynx FBO) provides fueling and oxygen services, aircraft parking, hangar rentals, aircraft maintenance, and avionics sales and service. Willamette Aviation Services provides aircraft fuel, aircraft parking, hangar leasing and sales, and aircraft rental and maintenance services. Flight training service are offered by Willamette Aviation Services and Aurora Flight Training (formerly Aurora Aviation), which is a non-FBO business.

Fuel Services

On airport fuel sales are provided by Atlantic Aviation, which has an above-ground 12,000-gallon aviation gasoline (AVGAS/100LL) tank and an above-ground 20,000-gallon Jet A tank located on leased ODAV property immediately southwest of the Atlantic Aviation building. Atlantic Aviation operates two mobile fuel trucks to ferry fuels from their tanks to aircraft parked on the apron. Additional off-airport fuel storage and service is available on surrounding private properties with TTF agreements. There are no known underground fuel storage tanks on airport property.

Emergency Services

Marion County Sheriff Department provides emergency service and response to the Aurora State Airport. A single dedicated deputy is assigned to the Aurora community, which includes the Airport. The Aurora Fire District provides fire suppression, rescue, emergency medical response, and hazardous material response. The nearest district fire station is in the City of Aurora, less than two miles from the Airport. The Aurora Airport Water Control District was formed in 2002 and installed a 247,800-gallon fire suppression system to assist the Aurora Fire District in protecting the Airport in the event of fire.

Landside Facilities

The landside elements section includes the landside facilities (depicted in **Figure 2-13**) designed to support airport operations, including aircraft storage and maintenance. This section of the existing conditions analysis includes a discussion of General Aviation (GA) Terminal Areas and "through-the-fence" (TTF) areas, hangars/ airport buildings, airport surface roads, vehicle parking, airport fencing, and utilities.

GENERAL AVIATION (GA) TERMINAL AREAS AND "THROUGH-THE-FENCE" (TTF) AGREEMENTS

As depicted in **Figure 2-16**, there are three discernible GA areas with landside aviation facilities at the Airport. All of the existing landside facilities are located on the east side of the runway:

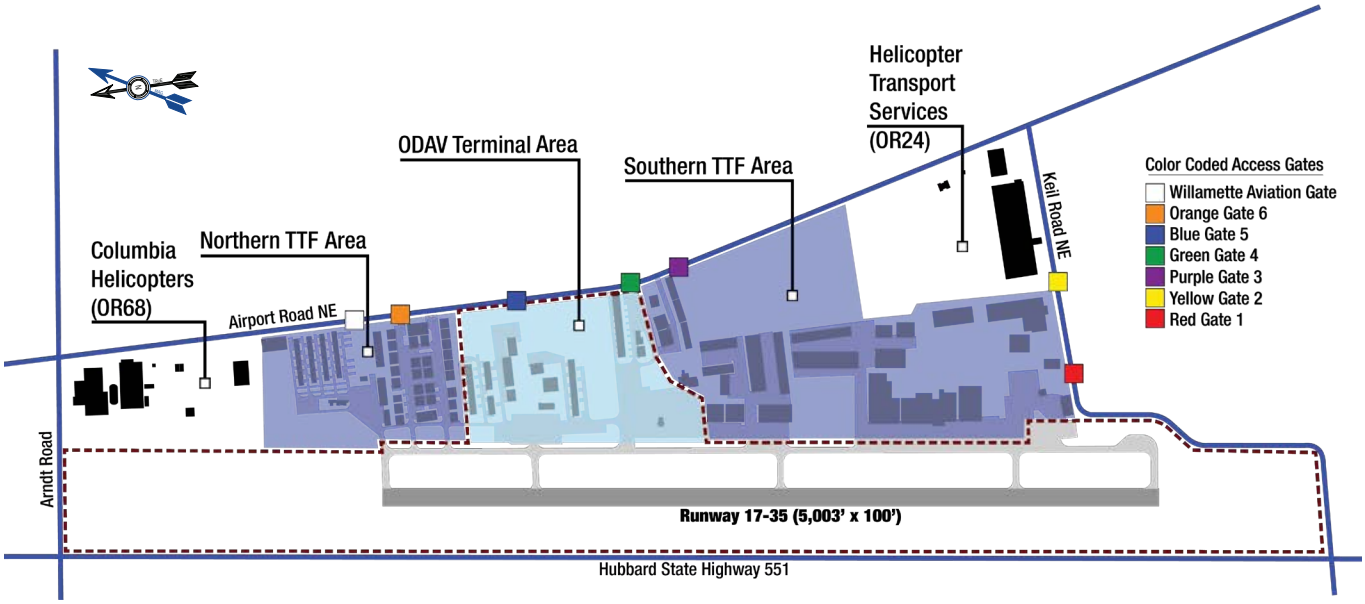
- **Terminal Area** – ODAV-owned property near the center of the airfield
- **North TTF Area** – privately-owned aeronautical use areas with ODAV-approved TTF access agreements
- **South TTF Area** – privately-owned aeronautical use areas with ODAV-approved TTF access agreements

The focus of the Airport Master Plan are the public facilities located on ODAV property and the eleven designated TTF access points on the airport property line. As noted earlier, the nearby Columbia Helicopters and Helicopter Transport Services (HTS) facilities are privately-owned helipads that are fully independent from Aurora State Airport operations and facilities. These facilities will not be included in the airport master plan evaluations.

Therefore, from a landside development standpoint, attention will be given to the facilities within the ODAV Terminal Area. In certain instances, appurtenant facilities in the North and South TTF Areas may be included to provide necessary context.

The ODAV Terminal Area is comprised of numerous hangars for storing general aviation aircraft, airport businesses like Aurora Flight Training, Aurora Aviation; an apron for itinerant traffic, and the FAA Air Traffic Control Tower (ATCT). The specific airfield facilities within this area of the Airport have been discussed within the relevant sections of this existing conditions analysis.

FIGURE 2-16: AURORA STATE AIRPORT GA TERMINAL AND TTF AREAS



Source: Developed by Century West Engineering

HANGARS/AIRPORT BUILDINGS

Buildings located on the Airport property and those located on adjacent TTF properties are summarized by ownership and general usage in **Table 2-14** below.

Table 2-14 summarizes the existing buildings, ownership, and general usage.

TABLE 2-14: HANGARS/AIRPORT BUILDINGS

	T-Hangar Buildings	T-Hangar Buildings SF	Conventional / Multiple-Aircraft	Conventional / Multiple-Aircraft SF	Other (business, office, etc)	Other (business, office, etc) SF	Total	Total SF
Northern TTF Area	5	47,300	33	163,100	1	1,500	35	211,900
ODAV Terminal Area	5	64,400	10	73,300	3	6,000	17	143,700
Southern TTF Area	-	-	28	623,000	2	14,500	30	637,500
Total	**10**	**111,700**	**71**	**859,400**	**6**	**22,000**	**82**	**993,100**

Source: Century West Engineering - Aerial photo based analysis

The 2019 *Constrained Operations Runway Justification Study* included a hangar/building analysis to identify new construction:

> *"Since 2012, most of the new hangar construction at the Airport has occurred in the South TTF Area. Approximately 30,650 SF of T-hangars were removed to accommodate construction of new larger conventional and corporate aircraft storage hangars. Overall, in the South TTF Area, including the HTS building, new construction amounted to approximately 223,000 SF of new aviation commercial and corporate aircraft storage space. Further expansion in the South TTF Area is ongoing.*
>
> *Within the ODAV Terminal Area no hangars had been removed since 2012 and new construction included one hangar at approximately 6,200 SF. There is approximately 8.1 acres of developable land within the ODAV Terminal Area. In the north end Columbia Helicopters area, new construction included approximately 3,500 SF of new storage buildings that appear to have been constructed to replace steel shipping/storage containers. No changes were identified in the Wiley or Willamette areas within the North TTF Area."*

AIRPORT SURFACE ROADS

There are multiple access points to the Airport that coincide with a colored gate system to clearly delineate Airport access and assist in emergency response and advertisement (see **Figure 2-16**). Stenbock Way NE access is located at the Purple Gate at Airport Road NE and is considered to be the major entry point to ODAV property due to the access provided to the ATCT. However, the Purple Gate entry on Stenbock Way NE provides access directly on to privately-owned land on the South TTF Area and provides access to numerous private hangars and buildings like the Columbia Aviation Association meeting facility.

Access to the ODAV Terminal Area is also provided at the unnamed access roads identified by the Green and Blue Gates on Airport Road, slightly north of the Purple Gate. The access road at the Blue Gate is the only public access point that is located entirely on public land. The road is approximately 700 feet long and provides vehicle access to Aurora Flight Training, a large vehicle parking lot, and most of the hangars located on public property.

VEHICLE PARKING

On the public land within the ODAV Terminal Area, several joint use parking lots are available near the public tiedown area, air traffic control tower, adjacent hangars, and airport related businesses. The parking areas on state-owned land provides parking for approximately 60 vehicles. The majority of the vehicle parking positions are located adjacent to Aurora Flight Training and is accessible from the Blue Gate. Several more parking positions located next to the ATCT are typically reserved for FAA ATCT and ODAV maintenance staff.

On the adjacent privately held land, airport businesses offer parking for employees and customers based on Marion County zoning and development standards. Individual hangar tenants typically park adjacent to or in their hangars while flying; some parking lots are available for their use, as well.

AIRPORT FENCING

Approximately four miles of fencing and access gates surround the entire Airport, inclusive of the public and private properties. The perimeter fencing was constructed in 1999 with a combination of private funds (for abutting private land areas) and FAA funds (for publicly owned airport land). All access points are gated, although not all are automated. The gates that are not automated are locked and are used to provide controlled access for maintenance. These gates are not intended for regular public use.

The Airport gate signage and color system (Red, White, Purple, Blue, Orange, Green, and Yellow) was installed at access points along Keil Road and Airport Road. The design, construction, and installation of the access gates was funded with private money. ODAV operates and maintains the Blue and Purple gates which provide access to public-use areas of the Airport. The remaining colored gates depicted in **Figure 2-16** serve private properties with access agreements and are operated and maintained by private operators.

UTILITIES

The developed areas of Aurora State Airport have water, sewer, storm water drainage, natural gas, and electric. The following text describes the major utilities serving the Airport.

Water

Water at the Airport is provided from a system of wells. In the early 2000s, with the assistance of Marion County, the Aurora Airport Water Control District was created to address major fire and life safety needs for privately-owned land adjacent to ODAV property at the Airport. The system included an underground tank system, a pump house, underground water pipes, fire hydrants, and numerous connections for fire sprinkler systems.

Sewer

Sanitary sewer is provided by individual and shared drain field/septic tank systems. There are six individual drain fields located on ODAV owned property, with three more proposed for the south end of the runway safety area (RSA) near the existing one used by the South End Airpark. The drain fields are shared for both aviation related uses on both private and publicly owned land.

Stormwater

The Airport's stormwater system is made up of a network of edge drain, culverts and surface drainage features which generally flow to the east, west, and south sides of the Airport. Most of the stormwater runoff originating on ODAV-owned property and airfield facilities like the runway, taxiway, and apron flows to the west side of the Airport.

Electric

Electric service is provided by Portland General Electric (PGE).

Gas

Natural gas service is provided NW Natural.

Airport Administration

The Airport Administration section provides a summary of Airport Ownership and Management, Airport Finance, Rates and Charges, and overview of FAA Grant Assurances and Compliance.

AIRPORT OWNERSHIP AND MANAGEMENT

Aurora State Airport is owned and operated by ODAV. ODAV manages Aurora State Airport among a group of 28 state-owned or operated airports from its office in Salem. The department has approximately 15 ½ full-time employees with one State Airports Manager, who is responsible for the day-to-day management of the airports. Airport management staff oversees grant administration, construction management, airport finance and leasing, as well as operations and maintenance of the Aurora State Airport. Airport tenants are responsible for managing their facilities and leased areas to meet the requirements defined in their leases.

AIRPORT FINANCE

ODAV operates Aurora State Airport within its group of state-owned airports as an enterprise fund. All revenue generated by the airports remains within the airport operating budget. This is a standard FAA requirement for all airports to prevent revenue diversion from airport operations to general services or non-airport operations.

The primary revenue generating sources for Aurora State Airport includes improved and unimproved ground lease rents, access fees from through-the-fence users, and fuel flowage fees. The primary expenditures for the Airport include airport legal fees, property taxes, maintenance and operation expenses, and personnel services. The Airport's capital improvement projects are typically funded through FAA grants with a local match that may be provided by ODAV grants. Based on a review of the airport's revenues and expenses for 2021, the airport's revenues exceed its expenses for normal operations and maintenance. A summary of the airports revenues and expenses are included in **Tables 2-15** and **2-16**.

TABLE 2-15: AIRPORT REVENUE/EXPENSE SUMMARY (2021)

AIRPORT REVENUE	
Leases, Tiedowns, Property Tax, Utilities	$83,203.15
Access Fees (Through-the-Fence)	$40,000.00
Fuel Flowage Fees	$92,114.00
TOTAL AIRPORT REVENUES	**$215,317.15**
AIRPORT EXPENSES	
Airport Personnel Services	$19,101.96
Transit Tax	$63.28
Utilities	$28,547.38
Maintenance & Inspections	$30,359.68
Supplies	$5,834.80
Legal Fees	$83,166.70
Reporting & Monitoring Charges	$14,050.00
Property Taxes	$33,009.73
TOTAL AIRPORT OPERATING EXPENSES	**$214,133.53**
NET OPERATING INCOME	**$1,183.62**

Source: ODAV Budget FY2021 Actuals

TABLE 2-16: AIRPORT RATES AND CHARGES DATA

RATES AND CHARGES	
FBO Tiedown Fees (Monthly)	$10.00
Non-Commercial Tiedown Fees (By Category) (Per Month)	
Category II	$20.00
Category III & IV	$17.50
Category V	$15.00
Access Fees (shall be the greater of the two (1) weight range or (2) minimum guarantee)	
(1) Weight Range (Per Month)	
Class 1 Aircraft (up to 5,000 lbs)	$15.00
Class 2 Aircraft (5,001 to 10,000 lbs)	$24.00
Class 3 Aircraft (10,001 to 20,000 lbs)	$44.00
Class 4 Aircraft (20,001 to 30,000 lbs)	$66.00
Class 5 Aircraft (30,001 to 40,000 lbs)	$88.00
Class 6 Aircraft (40,001 lbs and over)	$120.00
(2) Minimum Guarantee (Per Month)	
Category II	$275.00
Category III & IV	$175.00
Category V	$75.00
Fuel Flowage Fee (Per Gallon)	$0.08
Improved Ground Lease Rates (Sq/Ft) (Per Month)	$0.3256
Unimproved Ground Lease Rates (Sq/Ft) (Per Month)	$0.05

Source: ODAV State Airport Rates 2021

FAA COMPLIANCE OVERVIEW

A management program based on the FAA's "Planning for Compliance" guidance and the adoption of additional airport management "Best Practices" is recommended to address FAA compliance requirements and avoid noncompliance, which could have significant consequences.

Airport management "Best Practices" are developed to provide timely information and guidance related to good management practices and safe airport operations for airport managers and sponsors. The practices outlined herein are designed for use by ODAV for evaluating and improving their current and future operation and management program.

Airport sponsors must comply with various federal obligations through agreements and/or property conveyances, outlined in *FAA Order 5190.6B, Airport Compliance Manual*. The contractual federal obligations a sponsor accepts when receiving federal grant funds or transfer of federal property can be found in a variety of documents including:

- Grant agreements issued under the Federal Airport Act of 1946, the Airport and Airway Development Act of 1970, and Airport Improvement Act of 1982. Included in these agreements are the requirement for airport sponsors to comply with:
  - » Grant Assurances;
  - » Advisory Circulars;
  - » Application commitments;
  - » FAR procedures and submittals; and
  - » Special conditions.
- Surplus airport property instruments of transfer;
- Deeds of conveyance;
- Commitments in environmental documents prepared in accordance with FAA requirements; and
- Separate written requirements between a sponsor and the FAA.

OREGON AVIATION LAWS

The Oregon Department of Aviation (ODAV) has created both the Oregon Administrative Rules (OAR) and Oregon Revised Statutes (ORS) to govern airports within the state.

Oregon Administrative Rules (OAR)

- OAR Chapter 660, Division 13 – Airport Planning
- OAR Chapter 660, Division 13 – Exhibits
- OAR Chapter 738 – ODAV
- Non-Commercial Leasing Policy
- Commercial Leasing Policy
- Category II Minimum Standards Policy
- Category IV Minimum Standards Policy
- Category V Minimum Standards Policy
- Insurance Requirements

Oregon Revised Statutes (ORS)

- ORS 197 – Land Use Planning I
- ORS 197A – Land Use Planning II
- ORS 319 – Aviation Fuel Tax
- ORS 835 – Aviation Administration
- ORS 836 – Airports and Landing Fields
- ORS 837 – Aircraft Operations
- ORS 838 – Airport Districts

Airport Compliance with Grant Assurances

As a recipient of both federal and state airport improvement grant funds, the airport sponsor is contractually bound to various sponsor obligations referred to as "Grant Assurances", developed by FAA and the State of Oregon. These obligations, presented in detail in federal and state statute and administrative codes, document the commitments made by the airport sponsor to fulfill the intent of the grantor (FAA or state) required when accepting federal and/or state funding for airport improvements. Failure to comply with the grant assurances may result in a finding of noncompliance and/or forfeiture of future funding. Grant assurances and their associated requirements are intended to protect the significant investment made by the FAA or State of Oregon to preserve and maintain public-use airports as valuable transportation assets.

FAA Grant Assurances

The FAA's Airport Compliance Program defines the interpretation, administration, and oversight of federal sponsor obligations contained in grant assurances. The Airport Compliance Manual defines policies and procedures for the Airport Compliance Program. Although it is not regulatory or controlling with regard to airport sponsor conduct, it establishes the policies and procedures for FAA personnel to follow in carrying out the FAA's responsibilities for ensuring compliance by the sponsor.

The *Airport Compliance Manual* states the FAA Airport Compliance Program is: "...designed to monitor and enforce obligations agreed to by airport sponsors in exchange for valuable benefits and rights granted by the United States in return for substantial direct grants of funds and for conveyances of federal property for airport purposes. The Airport Compliance Program is designed to protect the public interest in civil aviation. Grants and property conveyances are made in exchange for binding commitments (federal obligations) designed to ensure that the public interest in civil aviation will be served. The FAA bears the important responsibility of seeing that these commitments are met. This order addresses the types of commitments, how they apply to airports, and what FAA personnel are required to do to enforce them."

According to the FAA, cooperation between the FAA, state, and local agencies should result in an airport system with the following attributes:

- Airports should be safe and efficient, located at optimum sites, and be developed and maintained to appropriate standards;
- Airports should be operated efficiently both for aeronautical users and the government, relying primarily on user fees and placing minimal burden on the general revenues of the local, state, and federal governments;
- Airports should be flexible and expandable, able to meet increased demand and accommodate new aircraft types;
- Airports should be permanent, with assurance that they will remain open for aeronautical use over the long-term;
- Airports should be compatible with surrounding communities, maintaining a balance between the needs of aviation and the requirements of residents in neighboring areas;
- Airports should be developed in concert with improvements to the air traffic control system;
- The airport system should support national objectives for defense, emergency readiness, and postal delivery;
- The airport system should be extensive, providing as many people as possible with convenient access to air transportation, typically not more than 20 miles of travel to the nearest NPIAS airport; and
- The airport system should help air transportation contribute to a productive national economy and international competitiveness.

The airport sponsor should have a clear understanding of and comply with all assurances. The following sections describe the selected assurances in more detail.

Project Planning, Design, and Contracting

Sponsor Fund Availability (Assurance #3)

Once a grant is given to the airport sponsor, the sponsor commits to providing the funding to cover their portion of the total project cost. Currently this amount is 10% of the total eligible project cost, although it may be higher depending on the particular project components or makeup. Once the project has been completed, the receiving airport also commits to having adequate funds to maintain and operate the airport in the appropriate manner to protect the investment in accordance with the terms of the assurances attached to and made a part of the grant agreement. It is noted that this Airport Master Plan project is 100% FAA funded due to the availability of grants associated with COVID-19 pandemic recovery.

Consistency with Local Plans (Assurance #6)

All projects must be consistent with city and county comprehensive plans, transportation plans, zoning ordinances, development codes, and hazard mitigation plans. The airport sponsor should familiarize themselves with local planning documents before a project is considered to ensure that all projects follow local plans and ordinances.

Accounting System Audit and Record Keeping (Assurance #13)

All project accounts and records must be made available at any time. Records should include documentation of cost, how monies were actually spent, funds paid by other sources, and any other financial records associated with the project at hand. Any books, records, documents, or papers that pertain to the project should be available at all times for an audit or examination.

General Airport Assurances

Good title (Assurance #4)

The airport sponsor must have a Good Title to affected property when considering projects associated with land, building, or equipment. Good Title means the sponsor can show complete ownership of the property without any legal questions, or show it will soon be acquired.

Preserving Rights and Powers (Assurance #5)

No actions are allowed, which might take away any rights or powers from the sponsor, which are necessary for the sponsor to perform or fulfill any condition set forth by the assurance included as part of the grant agreement.

Airport Layout Plan (ALP) (Assurance #29)

The airport sponsor should maintain an up-to-date ALP, which should include current and future property boundaries, existing facilities/structures, locations of non-aviation areas, and existing and proposed improvements. FAA requires proposed improvements to be depicted on the ALP in order to be eligible for FAA funding. If changes are made to the airport without authorization from the FAA, the FAA may require the airport to change the alteration back to the original condition or jeopardize future grant funding.

Disposal of Land (Assurance #31)

Land purchased with the financial participation of an FAA Grant cannot be sold or disposed of by the airport sponsor at their sole discretion. Disposal of such lands are subject to FAA approval and a definitive process established by the FAA. If airport land is no longer considered necessary for airport purposes, and the sale is authorized by the FAA, the land must be sold at fair market value. Proceeds from the sale of the land must either be repaid to the FAA, or reinvested in another eligible airport improvement project.

Airport Operations and Land Use

Pavement Preventative Maintenance (Assurance #11)

Since January 1995, the FAA has mandated that it will only give a grant for airport pavement replacement or reconstruction projects if an effective airport pavement maintenance-management program is in place. The Oregon Department of Aviation prepares and updates pavement reports for the airport. These reports identify the maintenance of all pavements funded with federal financial assistance and provides a pavement condition index (PCI) rating (0 to 100) for various sections of aprons, runways, and taxiways; including, a score for overall airport pavements.

Operations and Maintenance (Assurance #19)

All federally funded airport facilities must operate at all times in a safe and serviceable manner and in accordance with the minimum standards as may be required or prescribed by applicable Federal, State, and Local agencies for maintenance and operations.

Compatible Land Use (Assurance #21)

Land uses around an airport should be planned and implemented in a manner that ensures surrounding development and activities are compatible with the airport. Aurora State Airport is located in unincorporated Marion County. The airport sponsor should work with the county and adjacent land use jurisdictions to ensure that zoning and land use controls are in place to protect the airport from incompatible land uses. Incompatible land uses around airports represents one of the greatest threats to the future viability of airports.

Day-To-Day Airport Management

Economic Non-Discrimination (Assurance #22)

Any reasonable aeronautical activity offering service to the public should be permitted to operate at the airport as long as the activity complies with airport established standards for that activity. Any contractor agreement made with the airport will have provisions making certain the person, firm, or corporation will not be discriminatory when it comes to services rendered including rates or prices charged to customers.

Exclusive Rights (Assurance #23)

No exclusive right for the use of the airport by any person providing, or intending to provide, aeronautical services to the public. However, an exception may be made if the airport sponsor can prove that permitting a similar business would be unreasonably costly, impractical, or result in a safety concern, the sponsor may consider granting an exclusive right.

Leases And Finances

Fee and Rental Structure (Assurance #24)

An airport's fee and rental structure should be implemented with the goal of generating enough revenue from airport related fees and rents to become self-sufficient in funding the day-to-day operational needs. Airports should update their fees and rents on a regular basis to meet fair market value, often done through an appraisal or fee survey of nearby similar airports. Common fees charged by airports include fuel flowage fees, tiedown fees, landing fees, and hangar or ground lease rents.

Airport Revenue (Assurance #25)

Revenue generated by airport activities must be used to support the continued operation and maintenance of the airport. Use of airport revenue to support or subsidize non-aviation activities or to fund other departments who are not using the funds for airport specific purposes is not allowed and is considered revenue diversion. Revenue diversion is a significant compliance issue for FAA.

For additional information on FAA Grant Assurances, please visit: https://www.faa.gov/airports/aip/grant_assurances/#current-assurances

Taxiway A at A4 – Source: ODAV

Chapter 3

Aviation Activity Forecasts

COVID-19 STATEMENT (JANUARY 2022)

The preliminary forecasts were prepared at the end of the second full year of the COVID-19 pandemic. The disruption of airport activity experienced throughout the U.S. airport system related to COVID-19 since 2020 is unprecedented and has led to significant changes in activity that are not consistent with recent historical trends. It is acknowledged that not all elements of general aviation activity have been affected equally. Some segments of personal air travel have demonstrated resilience, partly in response to the heavily impacted commercial airline industry.

Although the limits of the current industry-wide disruption have yet to be defined, it is believed that the underlying elements of demand within general aviation will remain largely intact until all public health constraints are fully addressed and economic conditions gradually return to normal.

Federal Aviation Administration (FAA) forecast approval will be based in reference to the data and methodologies used and the conclusions at the time the document was prepared. However, consideration must still be given to the significant impacts of COVID-19 on aviation activity. As a result, there is lower than normal confidence in future growth projections.

FAA approval of the forecast does not provide justification to begin airport development. Justification for future projects will be made based on activity levels at the time the project is requested for development, rather than this forecast approval. Further documentation of actual activity levels reaching the planning activity levels will be needed prior to FAA participation in funding for eligible projects.

February 2023 Note: The draft aviation activity forecasts were submitted electronically to the FAA Seattle Airports District Office (ADO) on May 20, 2022 for formal review as part of Working Paper 1. All public comments provided on Working Paper 1 obtained through the airport master plan Planning Advisory Committee (PAC) and the overall public involvement process for the airport master plan, were organized (with responses) and forwarded to FAA with the working paper to aid in their formal review. FAA review comments on Working Paper 1 were received on August 17, 2022. The FAA requested Consultant/Sponsor responses to FAA comments and questions, and to provide any revised draft content that was developed in response to the FAA review/response. Written responses to FAA were provided by the Consultant/Sponsor on September 30, 2022. Follow-up coordination with FAA staff continued, including a request to provide a "track changes" version of the document for final FAA review. A record of these communications will be included in the public participation section of the airport master plan. A final draft of the chapters contained in Working Paper 1 will include revisions made during the extended comment period.

Introduction and Overview

This chapter provides a summary of historical aviation activity and new aviation activity forecasts for the 2021-2041 Aurora State Airport (Airport) - Airport Master Plan. The most recent aviation activity forecasts approved by the Federal Aviation Administration (FAA) for Aurora State Airport were developed in the 2012 Airport Master Plan and the 2019 Constrained Operations Runway Justification Study.

The aviation activity forecasts have a base year of 2021 (calendar year), the last year of complete data available when the preliminary forecasts were prepared. The base year is maintained for consistency in all subsequent forecast revisions leading to the final FAA-Approved 2021-2041 forecast. The forecast covers a 20-year period with reporting intervals at every five years. Multiple forecasting methodologies are used in this analysis and the models that provide the most valid outlooks are presented for comparison.

Aviation activity forecasts help determine if existing airport facilities are sufficient or will need to be modified to handle future demand (aircraft operations and based aircraft). The FAA Seattle Airports District Office (ADO) reviews the preliminary forecasts for rationality and comparison to the FAA Terminal Area Forecast (TAF). FAA forecast approval is a critical step in the airport master planning process since the projected activity will determine applicable design standards and other planning criteria.

The chapter is organized around the following sections:

- Introduction/Overview, FAA Forecasting Process;
- Key Activity Elements;
- Historical Data, Historical Forecasts, and Airport Events;
- Based Aircraft Forecasts;
- Aircraft Operations Forecasts;
- Peak Activity Forecasts;
- Design Aircraft; and
- Forecast Summary.

The overall goal is to prepare forecasts that accurately reflect current conditions, relevant historical trends, and provide reasonable projections of future activity, which can be translated into specific airport facility needs anticipated during the next 20 years and beyond. Aurora State Airport is currently capable of accommodating a full range of general aviation (GA) activity in both Visual Meteorological Conditions (VMC) and Instrument Meteorological Conditions (IMC). Aircraft use includes business class jets and turboprops, a wide variety of piston-engine aircraft, and helicopters.

The forecast methodologies presented in this chapter are consistent with the Airport's role as an urban general aviation airport and they do not anticipate a change in the Airport's functional role, such as the initiation of commercial passenger or cargo service.

The forecasts are unconstrained and assume the Oregon Department of Aviation (ODAV) will be able to make the facility improvements necessary to accommodate the anticipated demand, unless specifically noted. ODAV will consider if any unconstrained demand will not or cannot be reasonably met through the evaluation of airport development alternatives later in the airport master plan.

The historical development of landside facilities at Aurora State Airport, including aircraft hangars, has occurred both on and off ODAV-owned property. These facilities and the based aircraft they accommodate are identified as "inside the fence" or "through-the-fence (TTF)." All off-airport facilities/users with direct access to the runway-taxiway system have TTF access agreements with ODAV.

This Airport Master Plan will address needs for existing and future facilities that are, or would be under the direct ownership and management of ODAV. However, the activity generated by all aircraft that rely on TTF access to airfield facilities, are included in the Airport's based aircraft count and the aircraft operations data compiled by the air traffic control tower (ATCT). This activity will be included when evaluating runway-taxiway and related facility needs.

FEDERAL AIRPORT SYSTEM

As described in Chapter 2, Aurora State Airport is included in the federal airport system, referred to as the National Plan of Integrated Airport Systems (NPIAS). The NPIAS currently includes 3,304 public-use airports in all 50 states. Fifty-seven of Oregon's 97 public-use airports are included in the NPIAS.

Aurora State Airport is designated a **"National" Nonprimary General Aviation** airport. The role of National airports in the NPIAS is defined as follows:[1]

> *"National airports (84) are located in metropolitan areas near major business centers and support flying throughout the nation and the world. National airports are currently located within 31 states. They account for 13 percent of total flying at the studied general aviation airports and 35 percent of all flights that filed flight plans at the airports in the four new categories. These 84 airports support operations by the most sophisticated aircraft in the general aviation fleet. Many flights are by jet aircraft, including corporate and fractional ownership operations and air taxi services. These airports also provide pilots with an alternative to busy primary commercial service airports. There are no heliports or seaplane bases in this category.*
>
> *Criteria Used to Define the New National Category (all numbers are annualized):*
>
> *1) 5,000+ instrument operations, 11+ based jets, 20+ international flights, or 500+ interstate departures; or*
> *2) 10,000+ enplanements and at least one charter enplanement by a large certificated air carrier; or*
> *3) 500+ million pounds of landed cargo weight."*

Available data indicate that Aurora State Airport has consistently met or exceeded the FAA's "11+ based jet" and around 5,000+ instrument operations criterion established for National airports since the early 2000s.

Aurora State Airport, and nearby Portland-Hillsboro Airport (19 miles northwest) are the only FAA-designated National Airports located in Oregon.

STATE AIRPORT SYSTEM

As described in Chapter 2, Aurora State Airport is designated a **Category II – Urban General Aviation Airport** in the 2019 Oregon Aviation Plan (OAP v6.0). The definition for Category II airports is:

> *"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."*

1 2021-2025 NPIAS Report, Federal Aviation Administration (9/30/2020)

FAA Forecast Terminology

Aircraft Operation
A count of a takeoff, landing, or touch-and-go. Each time an aircraft touches the runway to takeoff or land, it counts as an operation.

Aircraft Approach Category (AAC)
Classification of an aircraft by approach speed, with A being the slowest and E being the fastest.

Airplane Design Group (ADG)
Classification of an aircraft by its size (wingspan and tail height) with I being the smallest and VI being the largest.

Airport Reference Code (ARC)
Used to determine facility size and setback requirements. The ARC is a composite of the AAC and ADG of the critical aircraft. ARC is no longer used in FAA Advisory Circulars. Instead AAC and ADG are identified independently. Though the term is no longer in use, previous studies described in this document may reference ARC.

Based Aircraft
Aircraft that are stored at the Airport,[1] either full-time or seasonally (more than half a calendar year).

Design Aircraft
The most demanding aircraft, or family of aircraft (in terms of size and/or speed) generating at least 500 annual operations at an airport. The design aircraft is used to establish the applicable AAC and ADG (for existing and forecast activity).

General Aviation (GA)
Aviation activities conducted by recreational, business, and charter users not operating as airlines under FAR Part 121, Part 135, or military regulations.

Air Taxi
Aviation activities conducted by on-demand or scheduled operators certified under FAR Part 135. The majority of air taxi activity is conducted with aircraft also operated by general aviation users.

Itinerant Operation
An operation that originates at one airport and terminates at a different airport. For example, an aircraft flying from the Airport to another airport.

Local Operation
An operation that originates and terminates at the same airport. For example, an aircraft takes off from the Airport, remains near the airport to practice flight maneuvers, and then lands at the Airport. Touch-and-go operations occur in the airport traffic pattern and they are categorized as local operations.

Touch-and-Go
A maneuver where an aircraft lands and takes off without leaving the runway. A touch-and-go is counted as two aircraft operations.

1 Includes aircraft located on ODAV-owned property and aircraft located on privately-owned property that have TTF access.
Source: Century West Engineering, FAA and industry terminology.

TABLE 3-1: FORECASTING DATA SOURCES

Source	Description
Air Traffic Control Tower (ATCT) Airport Operations Data	The FAA database provides aircraft operations counts for ATCT-equipped airports. For Aurora State Airport, ATCT reports became available in late 2015 when the ATCT opened. With an established 2021 base year for the new activity forecasts, a 6-year period (2016-2021) of full year ATCT data was used to provide a reliable historical indication of basic activity, adjusted to reflect specific conditions, to develop a 2021 baseline for new aircraft operations forecasts at the Airport. The FAA standard ATCT activity categories are not specific to aircraft types, but do break out local and itinerant operations. Itinerant operation counts are logged for air carrier, general aviation, air taxi, and military aircraft. Local operation counts are logged for civil and military aircraft. The Aurora ATCT manager also provided additional first-hand observations about the mix of air traffic, and common operational factors not captured in ATCT data for the Airport.

(Continued)

TABLE 3-1: FORECASTING DATA SOURCES

Source	Description
FAA National Based Aircraft Inventory Program	The FAA National Based Aircraft Inventory Program database assigns all eligible active civilian aircraft to individual airports, as reported and verified by airport owners. Aircraft reported by more than one airport are researched by airport management, with the final resolution approved by FAA. Inactive and other aircraft that do not meet FAA criteria may be listed, but they are not included in the airport's current "validated count." The FAA requires airport owners to update their counts periodically to reflect changes in activity. The accuracy of based aircraft counts at individual airports has improved significantly with more consistent airport verification and reporting. The current level of verification was not common in previous airport master plan data.
FAA Terminal Area Forecast (TAF)	The FAA TAF, published in May 2021, was used in this forecast evaluation. The TAF provides historical data and long-term projections for annual operations and based aircraft at all NPIAS airports, including Aurora State Airport. The forecasts are based on overall growth rates assigned by FAA and do not necessarily correspond to the previous airport master plan, or other existing forecasts. The airport master plan's recommended based aircraft and operations forecasts will be compared to the TAF as part of the FAA forecast review/ approval process.
FAA National Aerospace Forecast	The 2021-2041 Aerospace Forecast was referenced in this forecast evaluation. The FAA Aerospace Forecast is a national-level forecast of civil aviation activity that helps guide local forecasts by serving as a point of comparison between local and national trends.
Traffic Flow Management System Counts (TFMSC)	The TFMSC includes data collected from FAA instrument flight rules (IFR) flight plan filings. This activity is categorized by aircraft type and it provides airport origin-destination and time of day information for all flights, including flights that occur when the Aurora State Airport control tower is closed. The advantage of the TFMSC data is its degree of detail and insights into the more demanding aircraft operating at the Airport, such as jets and turboprops, that regularly file IFR flight plans. TFMSC data is the most reliable indicator of business aviation activity at the Airport, which is critical in documenting activity required for design aircraft designation and the operations fleet mix.
Socioeconomic Data	Socioeconomic data is provided by data vendor Woods & Poole, Inc. (W&P). Population data are provided by the Portland State University - Population Research Center (PRC). The PRC produces the annual population estimates and long term forecasts for Oregon and its counties and cities, as well as the estimates by age and sex for the state and its counties. These estimates are used by the state and local governments, various organizations, and agencies for revenue sharing, funds allocation, and planning purposes. The 2020-2065 PRC population forecast is the primary resource for evaluating changes in local area population during the airport master plan 20-year planning horizon. The W&P datasets for Marion and Clackamas Counties were used for this analysis. The W&P data provides 124 data categories with historical records from 1970 to 2019 and forecasts through 2050. Data categories considered include population, employment, earnings and income, and gross regional product.
State Aviation System Plans	The Oregon Aviation Plan (OAP v6.0) is the current state aviation system plan for Oregon, adopted in 2019. OAP v6.0 includes facility data, activity forecasts, system-wide minimum standards and performance measures for Oregon's public-use airports.
Previous Airport Planning	The 2012 Aurora State Airport Master Plan Update provides is the most recent FAA-approved airport layout plan (ALP) drawing for the Airport. The 2019 Constrained Operations Runway Justification Study provided updated aviation activity forecasts and airside facility requirements assessments related to the critical aircraft. Both planning documents were prepared prior to the COVID-19 pandemic.
Fixed Base Operator (FBO)	Historical fuel flowage data provided to airport management by the airport tenants providing aircraft services was reviewed. This information was consulted when developing aircraft operations forecasts.

Source: Century West Engineering

National General Aviation Activity Trends

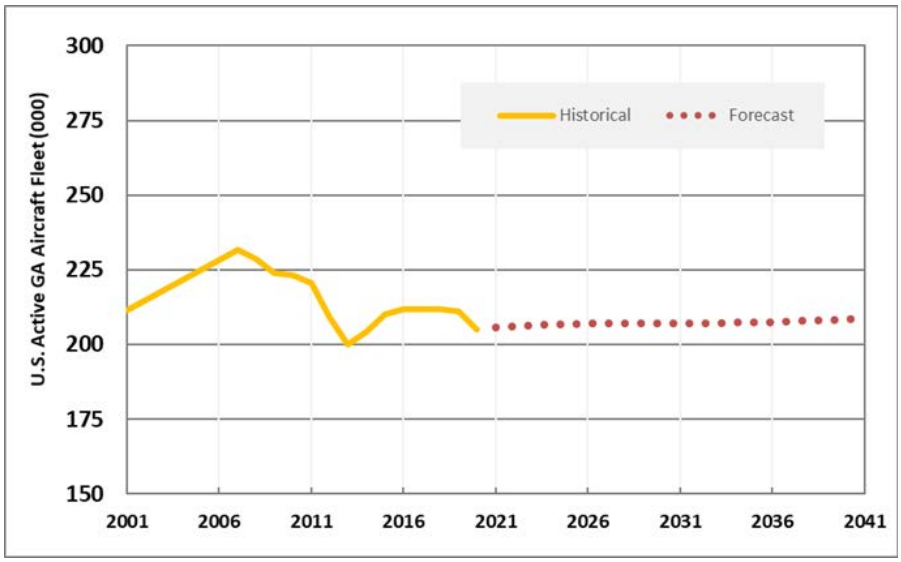
The first two decades of the 21st Century have presented numerous challenges for the GA industry. On a national level, most measures of GA activity declined sharply during the Great Recession, rebounded, then declined again at the outset of the COVID-19 pandemic.

Aircraft manufacturing, for example, hit a low point in 2010 after several years of growth, then rebounded and experienced relatively stable year-over-year growth through 2019. The COVID-19 pandemic abruptly slowed worldwide deliveries of GA aircraft in 2020, yielding a 12.9% (476 aircraft) decrease compared to 2019. In the same period, business jets declined by 10.3% (66 aircraft), turboprops by 13.0% (84 aircraft), and helicopters by 21.3% (151 aircraft), while piston-powered aircraft declined by less than 1% (3 aircraft). 2021 deliveries show signs of recovery with total civil aircraft deliveries up 13.4% (431 aircraft).

The FAA performs an annual assessment of U.S. civil aviation through its FAA Aerospace Forecast. The 20-year forecasts are updated annually by evaluating recent events and established trends affecting a wide range of commercial and GA segments. Broad economic conditions and current forecasts are examined in order to provide reasonable expectations for aviation within the broader U.S. and global economy. The FAA forecasts examine in detail several key aviation industry indicators including fuel prices, production and supply; aircraft manufacturing trends; aircraft ownership trends; fleet and pilot attrition; flight training trends; advances in fuel, engine, avionics, and airspace technology (ADS-B NextGen, etc.); and on-demand air travel. This array of factors is reflected in the FAA's overall assessment of future U.S. aviation activity. The 2021-2041 forecast factored in the impacts of the COVID-19 pandemic (through spring 2021) in both historical data and forecasts.

As depicted in **Figure 3-1**, the active U.S. GA fleet has fluctuated within a slight overall decline since 2001. This trend coincides with other GA industry trends including annual aviation fuel consumption, hours flown, IFR enroute air traffic, operations at towered airports, active pilots, etc. The most recent downward trend, attributed to the pandemic, reflects a sharp decline in 2019 and 2020 data. The FAA 2021-2041 forecast predicts that the active GA aircraft fleet will grow at an average annual rate of approximately 0.1% between 2020 and 2041 (forecast assumptions summarized below).

FIGURE 3-1: U.S. GA FLEET



Source: FAA Long Range Aerospace Forecasts (FY 2021-2041)

Although the FAA maintains a modestly favorable long-term outlook for general aviation, many of the activity segments associated with piston engine aircraft and aviation gasoline (AVGAS) consumption are not projected to return to "pre-Great Recession" levels within the 20-year forecast.

Key takeaways from the FAA 2021-2041 Aerospace Forecast Highlights are summarized below:

Positive Activity Indicators

- Turbine aircraft (turboprop, turbojet, helicopter) fleet and hours flown will grow;
- Sport and Experimental aircraft fleet and hours flown will grow;
- Piston Rotorcraft fleet and hours flown will grow;
- Jet fuel consumption will grow;
- The number of active Sport, Airline Transport, Rotorcraft only, and Instrument rated pilots will grow;
- GA Enroute IFR air traffic will grow; and
- GA Operations at towered airports will grow.

Negative Activity Indicators

- Fixed-wing Piston aircraft fleet and hours flown will decline;
- AVGAS consumption will decline; and
- The number of active private and commercial pilots will decline.

Neutral Activity Indicators

- Overall GA fleet net growth is nearly flat over the next 20 years.

The cited measures of national general aviation activity (positive, negative, neutral) are intended to reflect the broad expectations defined by FAA, which have varying relevancy to Aurora State Airport. For example, Van's Aircraft, a leading aircraft kit manufacturer located at the Airport, reports nearly 11,000 aircraft kits have been completed and flown, with thousands more kits currently under construction. It is apparent that this manufacturing activity has directly affected activity at Aurora State Airport. A significant, and growing percentage of the single-engine aircraft based at the Airport are kit aircraft, certified by FAA in the experimental category.

It is recognized that trends experienced at individual airports often deviate from system wide trends, and generally reflect localized factors. In its current forecast, the FAA expects general aviation to experience modest growth overall. The FAA's annual growth assumptions for individual general aviation activity segments are summarized in **Table 3-2**.

TABLE 3-2: FAA LONG RANGE FORECAST ASSUMPTIONS (U.S. GENERAL AVIATION)

ACTIVITY COMPONENT	FORECAST AVERAGE ANNUAL GROWTH RATE (2021-2041)
Aircraft in U.S. Fleet	
Single Engine Piston Aircraft in U.S. Fleet	-0.9%
Multi-Engine Piston Aircraft in U.S. Fleet	-0.4%
Turboprop Aircraft in U.S. Fleet	0.6%
Turbojet Aircraft in U.S. Fleet	2.3%
Experimental Aircraft in U.S. Fleet	1.4%
Sport Aircraft in U.S. Fleet	4.0%
Piston Helicopters in U.S. Fleet	0.9%
Turbine Helicopters in U.S. Fleet	1.6%
Active GA Fleet (# of Aircraft)	0.1%
Active Pilots in U.S.	
Sport Pilots	2.7%
Private Pilots	-0.4%
Commercial Pilots	-0.1%
Airline Transport Pilots	0.7%
Instrument Rated Pilots	0.4%
Student Pilots (Indicator of flight training activity)	-- (See note 1)
Active GA Pilots (All Ratings, Excluding Student Pilots)	0.2%
Hours Flown in U.S.	
Fixed Wing Piston Aircraft	-0.7%
Fixed Wing Turbine Aircraft	2.6%
Rotorcraft Piston Aircraft	1.9%
Rotorcraft Turbine Aircraft	2.1%
Experimental Aircraft	2.7%
Light Sport Aircraft	4.5%
Total GA Fleet Hours	1.0%
Fuel Consumption in U.S.	
AVGAS (Gallons consumed - GA only)	-0.3%
Jet Fuel (Gallons consumed – GA only)	2.4%

Source: FAA Long Range Aerospace Forecasts (FY 2021-2041)
1. Change in FAA certificate expiration; now excluded from forecast

Recent Events Summary

This following section briefly summarizes several events that contribute to the current airport activity levels and the development of new forecasts.

AVIATION FUEL VOLUMES

Operator-reported fuel delivery data for aviation gasoline (AVGAS) and jet fuel flowage fees reported to ODAV, were reviewed for the 2016-2021 period. As indicated in **Table 3-3**, annual volumes for both fuel grades have fluctuated over the six-year period, although the split between jet fuel and AVGAS volumes is relatively consistent. During this period AVGAS, fluctuated between 8 and 13% of total fueling volume at Aurora State Airport. It is unclear specifically what factors may have caused the fluctuations. However, competition for fuel sales from other airports and the effects of the COVID-19 pandemic shutdowns may have impacted sales. In any case, there is no evidence of a correlation between fuel sales and airport activity, and therefore the forecast will not consider this metric.

TABLE 3-3: FUEL FLOWAGE (GALLONS)

	2016	2017	2018	2019	2020	2021	Total
Jet Fuel	933,527	896,058	1,050,306	929,453	893,989	1,055,344	3,769,806
AVGAS	107,900	134,397	150,515	117,445	79,196	92,808	481,553

Source: Oregon Department of Aviation

FLIGHT TRAINING

Flight schools are not required by FAA to report annual aircraft operations by airport. Although the ATCT aircraft operations counts do not distinguish between flight training activity and other air traffic operating in the vicinity of the Airport, Aurora ATCT staff were consulted to approximate the portion of local operations that are associated with flight training. In addition to the two locally based flight schools (with about 20 fleet aircraft combined), the Aurora ATCT manager indicates that aircraft from Hillsboro, Troutdale, and Twin Oaks airports operate at the Airport daily.

The Aurora ATCT manager estimates that 40 to 45% of the total aircraft operations at Aurora State Airport are related to flight training, noting that “Aurora State is so dynamic in its day-to-day operations and highly dependent upon the weather. This percentage may be higher in the summer months.” It was also confirmed by the ATCT manager that most local operations at the Airport are flight training, and virtually all of those are runway related movements (touch and go, stop and go landings, etc.). The activity mix is consistent with historical ATCT operations counts and is reflected in the 2021 baseline operations total.

To get an idea of the current and future flight training activity at Aurora State Airport, the four most active flight schools at the Airport were identified and contacted for information regarding their current operations and plans for future growth. The schools contacted included Aurora Flight Training and Willamette Flight School, which operate out of Aurora State Airport, Hillsboro Aero Academy operating out of Hillsboro Airport, and Twin Oaks Flight Training out of Twin Oaks Airpark.

Aurora Flight Training and Willamette Flight School operate regularly out of Aurora State Airport since that is where they are based. Hillsboro Aero Academy and Twin Oaks Flight School do limited pattern work at Aurora State Airport as needed when conditions allow. Both operators estimated that approximately 5% of their training activities occur at Aurora State Airport. None of the surveyed schools maintain records of aircraft operations that take place at Aurora State Airport or any other airport they visit.

All of the contacted flight schools stated that they saw a large spike in student pilot activity in 2020, primarily due to factors related to the COVID-19 pandemic. During that time, students had extra disposable income from federal stimulus payments and a surplus of free time due to various shutdowns. Many new students in 2020 took advantage of both and started flight training. The schools also reported that 2021 levels largely leveled off compared to 2020 activity.

When asked about future plans for growth, the schools all indicated that they have no set plans to expand their business over the near term as they have no way of knowing how demand for flight training will change post-COVID-19.

FIXED BASE OPERATORS (FBO)

Aurora State Airport currently has two full service fixed base operators (Atlantic Aviation and Willamette Aviation Services) offering fuel, aircraft hangar and parking space, and aircraft maintenance services for a full range of general aviation and business aviation users. The current level of service reflects the Airport's ability to support the local based aircraft fleet and attract transient aircraft, including business aviation users in a highly competitive market.

SUMMARY OF RECENT ACTIVITY FORECASTS

The two most recent aviation activity forecasting efforts specific to Aurora State Airport were prepared in the 2012 Airport Master Plan Update and the 2019 Constrained Operations Runway Justification study. The 2012 Airport Master Plan used a 2010 base year with forecasts extending to 2030. The 2019 runway study used a 2018 base year with forecasts extending to 2038. The 2019 forecast was designed to be a minor update of the Airport Master Plan forecast with updated evaluations focused on the design aircraft and its associated runway length requirements. The 2019 forecast was also the first forecast supported by actual air traffic control tower operations counts. Both forecasts were prepared in the pre-COVID era.

The limitations associated with the availability and accuracy of aircraft activity data at Aurora State Airport have been described extensively in this chapter. The historical use of aircraft operations estimates before the availability of air traffic control tower counts and changes in the Airport's based aircraft counting methodology contributed to significant variability in both historical data and forecasts. The inability to establish fully quantifiable connections or meaningful comparisons between previous and current forecasts is also part of the historical record of evaluations conducted for the Airport. Looking forward, acknowledging previous forecast limitations provides important context related to the challenges of creating updated aviation activity forecasts where significant data limitations exist.

2012 Aurora State Airport – Airport Master Plan Update

The preferred based aircraft forecast projected an increase from 354 to 464 aircraft over the 20-year planning period. This forecast translates into a 1.36% average annual growth rate and a net increase of 110 aircraft. The preferred aircraft operations forecast projected an increase from 90,909 to 124,386 annual operations over the 20-year planning period. This forecast translates into a 1.58% average annual growth rate for the forecast period. The forecast identified the existing and future design aircraft as high performance medium business jets (IAI Astra and Cessna Citation X), both of which have Airport Reference Code C-II (ARC C-II) designations.

The 2012 Airport Master Plan forecasts were developed before the addition of the ATCT at the Airport. As result, baseline and forecast annual aircraft operations were based on estimates. These data were later found to have inadvertently overestimated activity when compared to actual aircraft operations counts logged by the ATCT. As noted elsewhere in the master plan, any estimates of air traffic for the Airport that pre-date the ATCT are not considered reliable or relevant for comparison. Similar issues are found with based aircraft data related to previous counting methods.

2019 Aurora State Airport – Constrained Operations Runway Justification Study

The preferred based aircraft forecast projected an increase from 349 to 561 aircraft over the 20-year planning period. This forecast translates into a 2.4% average annual growth rate and a net increase of 212 aircraft. The preferred aircraft operations forecast projected an increase from 66,153 to 112,200 annual operations over the 20-year planning period. This forecast translates into a 2.68% average annual growth rate for the forecast period. The forecast identified the existing and future design aircraft as ARC C-II medium business jet.

FAA Terminal Area Forecast

The 2020-2045 Terminal Area Forecast (TAF) of based aircraft and aircraft operations for the Airport was described earlier in the chapter. The TAF based aircraft forecast projects an increase from 346 to 554 aircraft over the 26-year forecast period (2019-2045). This forecast translates into a 1.09% average annual growth rate and a net increase of 208 aircraft. The TAF aircraft operations forecast projects an increase from 61,127 to 69,063 annual operations over the 26-year period. This forecast translates into a 0.47% average annual growth rate for the forecast period. The recommended airport master plan forecasts will be compared to the current TAF as part of the FAA review and approval process. Significant deviations from the TAF must be adequately documented for FAA forecast approval.

Oregon Aviation Plan V6.0 Model

The current Oregon Aviation Plan (OAP v6.0) was adopted in 2019 and provides long term aviation activity forecasts for all general aviation airports in the state. The OAP v6.0 relied on FAA TAF data for the 2015 baseline and its forecast horizon was 2015-2035.

The OAP v6.0 preferred based aircraft forecast annual growth rate was 1.1%. For Aurora State Airport, this model translated into increase from 346 to 421 based aircraft over the 20-year forecast period (+75 aircraft). The preferred aircraft operations forecast annual growth rate was 0.9%. For Aurora State Airport, this model translated into increase from 94,935 to 113,231 annual operations over the 20-year forecast period.

CHANGES IN DATA SOURCES AND METHODOLOGY

Several improvements in data sources, verification and methodology have occurred since the previous master plan was completed in 2012. The changes provide a more accurate definition of airport activity than presented previously. These changes, described below and in Chapter 2, are incorporated into the 2021 airport activity data that is the baseline for new 20-year aviation activity forecasts.

The updated data provides a more accurate picture of current activity at Aurora State Airport, and therefore the ability to develop more reliable long-term aviation activity forecasts. However, it is important to recognize that the recent improvements in data accuracy reduces the ability to draw definitive conclusions when comparing to previously-reported estimates or forecasts. As a result, it is recommended that the new aviation activity forecasts be reviewed using consistent data sources and the assumptions defined in each forecast model, rather than a comparison to previous forecasts.

BASED AIRCRAFT COUNTING METHODOLOGY

The FAA's method of monitoring an airport's based aircraft fleet has improved in recent years. Airport owners are now required by FAA to regularly update their locally-based aircraft totals through verification and submittal of validated counts through the FAA National Based Aircraft Inventory Program (www.basedaircraft.com). The coordinated reporting eliminates duplicated (aircraft counted at more than one airport) and inactive aircraft. The regular reporting also allows more opportunities to review and validate aircraft. Inactive aircraft can be added to an airport's validated count when reactivated in the FAA's system.

In late 2021, the ODAV State Airport Manager reviewed the based aircraft count for Aurora State Airport, previously updated in 2018. The evaluation was completed in consultation with the FAA Seattle Airports District Office in December 2021, and resulted in a new validated count of 281 based aircraft. The previous count was 349 based aircraft 2018. The reduction in the Airport's based aircraft total reflects a more precise verification of aircraft and removal of previously-counted aircraft located at two private heliports adjacent to Aurora State Airport.

During its review of Working Paper 1 in summer of 2023, the FAA provided an internal historical summary document of validated aircraft for the Airport. These data are summarized later in the chapter, and are used to establish the baseline activity level.

The 2022 validated based aircraft count included the following adjustments to the previous inventory:

- Added new aircraft not previously entered (or assigned to the Airport) in the database;
- Removed aircraft that could not be physically verified on site;
- Removed aircraft that were also reported by other airports and could not be verified on site for 6+ months per year;
- Removed aircraft without current FAA registrations or airworthiness certificates; and
- Removed aircraft (21 helicopters) located at the nearby Columbia Helicopters Heliport (FAA Identifier: OR68) and the HTS Aurora Heliport (FAA Identifier: OR24).

Based on FAA facility criteria, it was determined that the two private heliports operate independently from Aurora State Airport since their aircraft do not require access to the runway-taxiway facilities. Historically, these aircraft have been included in previous airport master plan forecasts and data sets. Based on current FAA guidance, the off-airport aircraft at OR68 and OR24 are not be reflected in baseline data or new airport master plan forecasts for

Aurora State Airport. In addition to the adjustment in based aircraft numbers, the Airport's ATCT aircraft operation counts were adjusted to reflect the separation of on- and off-airport activity that share the designated Class D controlled airspace. Additional information on ATCT operations adjustments is provided later in this chapter.

The current split between aircraft located on airport property and on adjacent privately-owned property with TTF access agreements was verified in the updated validated count. Both on-airport and TTF aircraft are included in the Airport's current and historical FAA validated counts since they all rely on the runway-taxiway system for their flight operations. It is noted that the FAA does not normally consider TTF aircraft as "based aircraft" at the airports they access and utilize. However, due to the fact that the TTF at Aurora State Airport do not have to cross a fence to enter the airfield and that the TTF facilities are seamlessly integrated with the Airport, the FAA has in this one instance, approved the TTF aircraft at Aurora State Airport has based aircraft. As noted earlier, helicopters located at the two private heliports adjacent to the Airport are not "TTF aircraft" and they are not included in current based aircraft counts for the Airport. This accounting is consistent with current FAA guidance, and it is a change from the previous FAA-accepted counting methodology used at the Airport. Prior to this airport master plan, these (non-TTF) helicopters were included in based aircraft counts for Aurora State Airport.

The new validated based aircraft count for the Airport was approved and accepted by FAA in January 2022. The FAA requires the January 2022 validated count (281) to serve as the common baseline for all based aircraft forecast models in the Airport Master Plan. Other existing FAA data sources reporting based aircraft (5010-1 Airport Record Form, Terminal Area Forecast, etc.) will be updated for consistency with the current validated count.

TABLE 3-4: BASED AIRCRAFT AND FLEET MIX

Aircraft Type	On-Airport	TTF	Total
Single Engine	45	175	220
Multi Engine	1	14	15
Jet	3	33	36
Helicopter	1	9	10
Total	**50**	**231**	**281**

Source: ODAV Airport Management Count submitted to FAA and accepted by FAA for use as the baseline in the 2021-2041 Airport Master Plan forecast.

The January 2022 validated based aircraft count for Aurora State Airport is summarized in **Table 3-4**. The summary includes a breakdown of aircraft by types, consistent with FAA data reporting. Additional information on aircraft types and categories is provided on the following page. The FAA National Based Aircraft Inventory Program report (January 2022) for the Airport is provided in **Appendix 7**.

NATIONAL BASED AIRCRAFT INVENTORY HISTORY

During its Spring 2023 review of the preliminary aviation activity forecasts presented in Working Paper No. 1, the FAA provided an 11-year summary (2013-2023) of Aurora State Airport based aircraft counts, as reported and validated in the National Based Aircraft Inventory Database, more commonly known as BasedAircraft.com. The historical summary of individual reports provided a complete timeline of data recorded in the FAA's internal system. Data detailing the on-airport versus TTF splits over the historical period are not available and are not included in the following summary.

The counts for each year are points in time, representing January 1st of each year. The 2021 base year count discussed above began in December of 2021 and was finalized on January 12th, 2022. The validated totals that came out of that count were assumed to reflect the end of year conditions at the airport and were applied to the 2021 calendar year. It should also be noted that BasedAircraft.com counts are constantly being updated as airports around the nation report changes to their fleets. If an aircraft is reported as based at more than one airport, that aircraft is removed from the validated count of both airports until additional evidence is provided to show at which facility the aircraft meets the criteria to be considered a based aircraft. Due to these factors, the totals reported for the forecast base year do not exactly match the results of the ODAV count that was finalized on January 12, 2021. However, the counts, with some adjustments to be described below, are the most complete and accurate record of based aircraft available and will serve as an excellent dataset from which to perform trend analysis, a process that will be described later in this chapter.

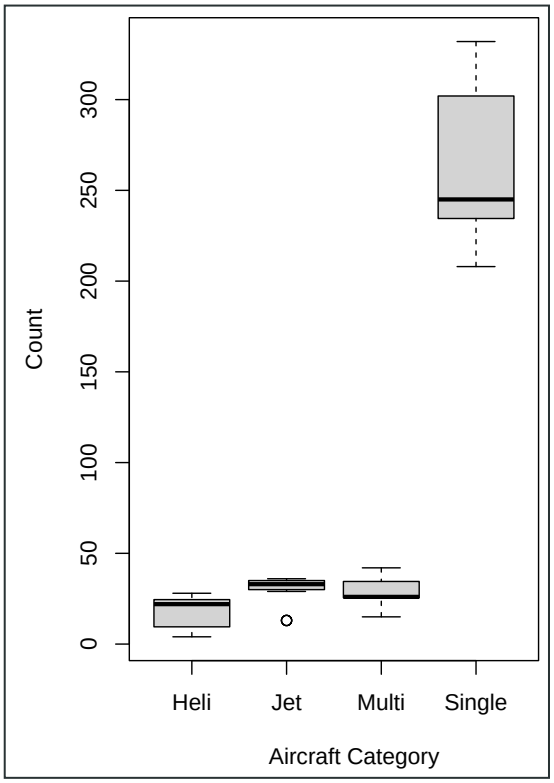
National Based Aircraft Inventory History Data Adjustments

Two adjustments were made to the raw data prior to developing trends. The first was to remove helicopters located at the two neighboring off-site facilities (OR68 and OR24). It was determined during the 2021 based aircraft count completed by ODAV at the end of that year, that there were 21 helicopters counted as Aurora State Airport-based aircraft prior to updating the count at the end of that year. Those 21 helicopters were removed from the BasedAircraft.com inventory for Aurora State Airport. The correction is reflected in the FAA-provided history in 2022 and 2023 counts (due to January 1 timing for each year). Both OR24 and OR68 have operated since at least 2013. Detailed helicopter counts for each facility are not available prior to 2021. Since there is no better information available, it is assumed that both OR24 and OR68 based similar numbers of aircraft annually over that period, and 21 helicopters were subtracted from the validated inventory for each year prior to 2022.

The second adjustment concerns jet aircraft. The number of jets reported at Aurora State Airport increased dramatically from 13 in 2013 and 2014 to 34 in 2015, a 162% increase. It was hypothesized that the sudden increase was related to the construction of the ATCT in 2015. While the ATCT was not operational until the third quarter of 2015, it's reasonable to expect that additional jets would begin arriving at the Airport in the months preceding in anticipation of the increased operational capability and improved safety that the tower would bring. Assuming that was the case, jet counts prior to 2015 may be identified as outliers and removed from the analysis, as they reflect a different operating environment that is not representative of the greater dataset.

To determine if there were any outliers in the dataset, an outlier analysis was performed across all aircraft classifications. The interquartile range (IRQ) was calculated for each classification. IQR is a measure of variability based on dividing a dataset into quartiles. Quartiles divide an ordered data set into four equal parts. The divisions between these parts are known as first, second, and third quartiles (Q1, Q2, and Q3). The distance between Q1 and Q3 is the IRQ. Data points that fall more than 1.5*IQR below Q1 or 1.5*IQR above Q3 are considered outliers and may be excluded from analysis, as they may be impacted by external factors unrelated to the rest of the dataset.

FIGURE 3-2: BASED AIRCRAFT BY CATEGORY



The results of this analysis are often summarized in a box plot. Box plots are a simple way to quickly summarize the distribution of a dataset and identify any outliers. In a box plot, the boxes represent the IQR, the T-bars, commonly called 'whiskers', represent Q1 – 1.5*IQR and Q3 + 1.5*IQR. Points that fall outside of these whiskers are outliers. A box plot developed for the Aurora State Airport based aircraft counts is shown in **Figure 3-2**.

The outlier analysis showed that the jet counts reported for 2013 and 2014 are statistical outliers compared to other years. It should be noted that a data point identified as an outlier should not simply be automatically removed based on this analysis alone. Investigators should also examine the greater context of the dataset and should only remove data if a reasonable explanation can be suggested. In this case, considering the context of the ATCT coming online at the same time, it is reasonable to conclude that the 2013 and 2014 jet counts reflect the conditions of a different operating environment. As such, the 2013 and 2014 jet counts were excluded from the dataset. The raw and adjusted BasedAircraft.com annual counts are summarized in **Table 3-5**.

TABLE 3-5: NATIONAL BASED AIRCRAFT INVENTORY VALIDATED COUNTS‡

	2013		2014		2015		2016		2017		2018		2019		2020		2021		2022		2023	
	Raw	Adj	Raw	Adj	Raw	Adj	Raw	Adj	Raw	Adj	Raw	Adj	Raw	Adj	Raw	Adj	Raw	Adj	Raw	Adj	Raw	Adj
Single Engine*	245	245	242	242	332	332	322	322	318	318	235	235	234	234	286	286	278	278	208	208	217	217
Multi Engine**	26	26	25	25	42	42	41	41	41	41	28	28	26	26	26	26	26	26	15	15	15	15
Jet	13	13	13	13	34	34	33	33	31	31	29	29	35	35	36	36	33	33	35	35	36	36
Helicopter	25	4	25	4	46	25	44	23	43	22	37	16	46	25	49	28	45	24	9	9	10	10
Total	309	288	305	284	454	433	440	419	433	412	329	308	341	320	397	376	382	361	267	267	278	278

Source: Century West Engineering developed FAA-provided National Based Aircraft Inventory Data
‡ The totals presented reflect the validated counts on January 1 of each year.
* Includes SETP, LSA, and SE Experimental Aircraft
** Includes METP

HISTORICAL OPERATIONS DATA CHALLENGES

Ideally, when developing operations forecasts a robust set of historical data are available from which to base or compare forecast models. Unfortunately, this is not the case at Aurora State Airport. This lack of a representative operational history creates challenges in developing accurate forecast models.

The Airport ATCT has been in operation and recording activity since October 2015, which results in six complete years of operations counts between the opening of the tower and the AMP base year (2021). Generally, at least 10 years of data are preferred to develop 20-year forecasts.

In addition to the short history of available data, several significant events appear to have skewed the data. First, the adjusted ATCT recorded counts show a 20% single-year increase in operations between 2016 and 2017 and an 8% increase between 2017 and 2018. These annual growth rates far surpass what would be expected for an airport like Aurora State Airport under normal conditions. It could be reasonably surmised that the sharp growth over the two-year period was related to the ATCT coming online, which contributed to increased demand for aircraft preferring to operate in the Airport's controlled airspace environment.

Second, the data show significant variability in 2020 and 2021 due to the impacts of the COVID-19 pandemic and the subsequent recovery. As discussed previously, local area flight schools reported a notable increase in flight training activity in 2020, which was partly attributed to an increase in existing and potential students' free time when normal workplace routines were disrupted. An increase in disposable income during this period related to a variety of stimulus payments is also believed to have contributed to increased flight training activity. At the same time, business air traffic activity decreased due to limited operations and shutdowns which resulted in a 6% decrease in itinerant GA traffic and a 32% decrease in air taxi activity. The inverse was observed in 2021 as businesses and employees returned to normal operations. During that time, flight training activity leveled off as noted by the interviewed flight schools, and business aircraft activity surged with itinerant GA activity increasing by 15% and air taxi activity increasing by nearly 78%

No matter the specific reason for these dramatic increases in operations at Aurora State Airport, it is evident that these three years – accounting for 50% of the available historical data – are not representative of the typical operating environment at Aurora State Airport and as such, the historical ATCT counts should not be used to develop trends from which to forecast future activity.

Single-Engine Piston (SEP) and Turboprop (SETP)
SEP aircraft have one piston-powered engine. SETP aircraft have one turbine powered engine used to drive the aircraft's propeller. Both types of aircraft are generally small aircraft (≤12,500 pounds) certified under 14 CFR, Part 23. These aircraft are often used for flight training, recreational flying, and business trips. SETP aircraft are also commonly used for business aviation, air ambulance, and air cargo flights. Depending on weight and operator certification, these aircraft generally require only one pilot. Single-engine piston and turboprop aircraft are included in the "Single Engine" category on the FAA 5010-1 Airport Master Record Form and the FAA National Based Aircraft Inventory Program.

Multi-Engine Piston (MEP) and Turboprop (METP)
MEP/METP aircraft have two or more engines and are typically larger than SEP/SETP aircraft. Multiple engines make the aircraft more capable and require additional flight instruction beyond what is needed to operate an SEP/SETP aircraft. MEP aircraft are primarily used for personal travel, flight training, and business aviation. METP aircraft are used extensively in business aviation. Most MEP/METP aircraft may be operated with one pilot, but some larger aircraft may require two pilots. MEP/METP aircraft are included in the "Multi Engine" category on the FAA 5010-1 Airport Master Record Form and the FAA National Based Aircraft Inventory Program.

Jets
Jet aircraft have one or more turbofan/turbojet engines instead of a piston or turboprop engine. These aircraft range in size from small, four-passenger business jets to the largest airliners. They can generally fly faster and at higher altitudes than piston and turboprop aircraft, providing service capabilities (range, speed) comparable to commercial airliners. Some civilian jets are certified for single-pilot operation, although the majority of jet models require two pilots.

Helicopter
Helicopters have one or more rotors mounted above the cabin for lift and propulsion. Helicopters are commonly used for aerial firefighting, law enforcement, emergency response, medical evacuation (MEDEVAC), flight training, and aerial inspection (pipeline, forestry, aerial agriculture, etc.). Helicopters may be piston- or turbine-powered, and depending on the complexity of the model, can be operated by one pilot or two.

Other
Some aircraft that are included in the categories noted above may further categorized by FAA based on their design category or type certificate.

- Experimental aircraft refer to kit airplanes built by users or third parties other than the original manufacturer. Experimental aircraft share many characteristics with SEP aircraft; the key differentiator is how and where the aircraft is assembled. These aircraft are commonly included in the "Single Engine" category in FAA airport records (5010, Based Aircraft Inventory), rather than "Other."
- Sport aircraft (also referred to as Light Sport Aircraft, or LSA) are airplanes that have a specific weight and maximum speed in level flight. Sport aircraft require less training and a less strict medical certificate to pilot the aircraft. These aircraft are listed in the "Single Engine" category in FAA 5010 airport records.
- Gliders are unpowered aircraft that are towed into flight and use thermal uplift to sustain altitude. Powered gliders are equipped with engines and are capable of takeoff without the aid of tow plane. These aircraft are listed in the "Gliders" category in FAA 5010 airport records.
- Ultralight aircraft weigh less than 155 pounds and do not require the pilot operating the aircraft to have a private pilot's license or medical certificate. These aircraft are listed in the "Ultralights" category in FAA 5010 airport records.

Source: Century West Engineering, FAA and industry terminology.

ANNUAL AIRCRAFT OPERATIONS

The addition of an ATCT at Aurora State Airport in October 2015 provides actual counts of aircraft takeoffs and landings during the 13 hours (0700 to 2000 hours - local) of daily operation. Overall aircraft operations data presented in the last Airport Master Plan were estimated and supplemented with limited instrument flight plan data. The ability to accurately estimate aircraft operations is greatly improved with actual data accounting for the majority of flight activity.

As described in Chapter 2, the 2021 baseline aircraft operations total was developed using actual air traffic control tower counts, with two specific adjustments. First, an adjustment was made to account for aircraft activity occurring during non-ATCT operating hours (2000 to 0700). Based on methods described in Chapter 2, off-hours IFR activity was estimated to account for 14% of annual operations, and off-hours VFR activity was estimated to account for 5% of annual operations. Combined, total estimated off-hours operations accounted for 6.4% of 2021 activity.

A second adjustment was made to eliminate helicopter operations for the two adjacent private heliports. The movement of these aircraft in and out of the Airport's controlled airspace is captured in the operations counts for Aurora State Airport because the traffic is handled by the ATCT. However, separating the activity from Aurora State Airport runway operations is appropriate since the aircraft do not actually takeoff or land on the Airport. Based on standard FAA air traffic control procedures, ATCT operations counts do not distinguish between fixed-wing aircraft and helicopters.

As noted earlier, annual operations estimates were requested from both off-airport private heliport operators. Each operator estimated between 200 and 300 annual operations were generated at their individual facilities, yielding a total of approximately 600 annual operations. However, in later discussions, the ATCT manager estimated the off-airport helicopter activity to be closer to 3% of total ATCT-logged itinerant operations for the Airport (approximately 1,200 operations in 2021). The planning team determined that the higher ATCT estimate should be used to ensure that all off-airport helicopter operations were identified and removed from the Airport's operations totals. A reduction of 3% was applied to itinerant operations as reported by the OPSNET Airport Operations Report to account for the helicopter flight activity associated with the two adjacent heliports.

Detailed breakdowns of VFR and IFR operational splits were developed from these data, for use in forecasting future activity.

Table 3-6 summarizes adjusted annual (calendar year) aircraft operations for Aurora State Airport for the historical period (2016- 2021). For consistency in data, the adjustments described above were applied retroactively to the historical years coinciding with the operation of the air traffic control tower. The 2016-2021 period presented represents all full-calendar year data available from the opening of the tower (October 2015) the forecast base year (2021). Operations data prior to this period are based on estimates and are not considered reliable.

TABLE 3-6: AURORA STATE AIRPORT HISTORICAL ATCT OPERATIONS COUNTS (ADJUSTED CALENDAR YEAR DATA)

	Annual Aircraft Operations											
	2016		2017		2018		2019		2020		2021	
Itinerant	Raw	Adj*	Raw	Adj*	Raw	Adj*	Raw	Adj*	Raw	Adj*	Raw	Adj*
Air Taxi	2,040	2,194	2,163	2,319	1,980	2,121	1,567	1,670	1,061	1,129	1,885	2,006
General Aviation	30,909	32,174	32,291	33,502	34,390	35,665	32,583	33,638	30,680	31,621	35,308	36,390
Military	246	265	186	199	259	277	100	107	36	38	74	79
Subtotal	33,195	34,633	34,641	36,020	36,629	38,063	34,252	35,415	31,777	32,788	37,267	38,475
Local												
General Aviation	15,053	16,191	23,391	25,075	26,145	28,011	28,566	30,453	34,154	36,333	35,221	37,488
Military	129	139	120	129	229	245	32	34	18	19	61	65
Subtotal	15,182	16,330	23,511	25,204	26,374	28,256	28,598	30,487	34,172	36,352	35,282	37,553
Total	48,377	50,963	58,152	61,223	63,003	66,320	62,850	65,902	65,949	69,140	72,549	76,028

Source: Century West Engineering developed using FAA OPSNET (Airport Operations) Data

INSTRUMENT FLIGHT PLAN (TFMSC) DATA

A 10-year summary of instrument flight plan data at Aurora State Airport gleaned from FAA Traffic Flow Management System Counts (TFMSC) records is provided in **Table 3-7**. The FAA TFMSC provides detailed, aircraft-specific data for flight plan filings and aircraft movements. TFMSC data provides a reliable accounting of instrument flight plans filed to and from an airport and includes relevant aircraft-specific data such as type, ADG, and ARC. However, TFMSC data only includes operations that have an active instrument flight plan filed on arrival or departure to/from the facility. This caveat means that operations by aircraft that choose to cancel their flight plan prior to arrival and arrive VFR, or aircraft that depart the airport VFR and file a flight plan enroute are not included in the count. To account for those operations, FAA directs[2] planners to normalize the data by examining TFMSC-reported arrivals and departures, identify the higher of the arrival or departure count by aircraft type and multiply by two, effectively balancing arrivals and departures by aircraft type. This accounts for any operations performed under VFR and not included in the TFMSC data.

2 FAA AC-150/5000-17, Critical Aircraft and Regular Use Determination, Section 2.2

The 2012 Airport Master Plan update identified the current and future design aircraft to be a high-performance jet categorized as Aircraft Approach Category (AAC) C and Airplane Design Group (ADG) II. This finding was confirmed in the data review contained in the 2019 Constrained Operations Runway Justification Study. Further discussion of AAC and ADG and their roles in determining the critical aircraft for this airport master plan is presented in the Critical Aircraft section later in this chapter.

It should be noted that during the review of the TFMSC data, a small number of jet aircraft were found to not be assigned an AAC and ADG in the data and were instead included in the "Unknown" category. These aircraft were manually assigned AAC and ADG classifications based on data from the FAA Aircraft Characteristics Database and aircraft manufacturer provided data. Furthermore, operations by military aircraft were identified and excluded from the analysis.

TABLE 3-7: AURORA STATE AIRPORT INSTRUMENT FLIGHT OPERATIONS

TFMSC IFR Operations by AAC/ADG - Calendar Year Data											
AAC/ADG	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	Average Annual Operations
A-I	2,372	2,638	2,414	2,482	2,750	2,750	3,428	2,458	2,162	2,330	2,578
A-II	410	494	1,108	1,554	1,814	1,966	1,844	1,158	930	1,398	1,268
A-III	14	6	2	4	4	10	6	2	0	4	5
A-IV	0	0	0	0	0	0	0	0	0	0	0
B-I	1,498	1,368	1,422	1,194	1,198	1,126	1,134	1,190	1,024	1,154	1,231
B-II	2,222	2,232	2,214	2,620	3,270	3,110	3,152	3,798	3,448	4,182	3,025
B-III	0	0	0	2	0	2	4	8	2	0	2
B-IV	0	0	0	0	0	0	0	0	0	0	0
C-I	360	374	514	440	340	306	274	286	170	274	334
C-II	348	378	294	208	316	370	358	226	242	264	300
C-III	18	10	4	8	0	14	50	54	10	0	17
C-IV	0	0	0	0	0	0	0	0	0	0	0
C-V	0	0	0	0	0	0	0	0	0	0	0
D-I	2	8	16	0	4	6	8	4	0	12	6
D-II	4	0	4	0	2	6	2	8	26	84	14
D-III	6	10	4	2	6	8	4	0	4	6	5
D-IV	0	0	0	0	0	0	0	0	0	0	0
D-V	0	0	0	0	0	0	0	0	0	0	0
Unknown	446	390	380	388	504	376	366	472	442	572	434
Total	**7,700**	**7,908**	**8,376**	**8,902**	**10,208**	**10,050**	**10,630**	**9,664**	**8,460**	**10,280**	**9,218**
Operations by AAC C and D Aircraft	**738**	**780**	**836**	**658**	**668**	**710**	**696**	**578**	**452**	**640**	**676**
Operations by ADG II and Larger	**3,022**	**3,130**	**3,630**	**4,398**	**5,412**	**5,486**	**5,420**	**5,254**	**4,662**	**5,938**	**4,635**

Source: FAA TFMSC Report - 4/14/2022 (Aurora State Airport)

TERMINAL AREA FORECAST

The FAA Terminal Area Forecast (TAF) for Aurora State Airport, published May 2021, provides historical and forecast data for the period 1990-2045. Current and historical TAF based aircraft and operations data for the Airport share many of the data collection issues described earlier. Accordingly, the historical TAF activity data for Aurora State Airport are not considered accurate enough to draw reliable conclusions related to current activity data. Historical (2000-2020) TAF based aircraft and annual aircraft operations data are presented in **Figures 3-3 and 3-4**. The 2021 baseline activity levels for based aircraft and operations are depicted for reference.

FIGURE 3-3: HISTORICAL TAF – BASED AIRCRAFT

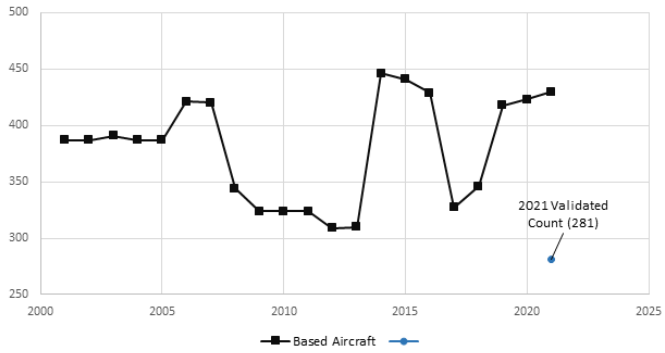
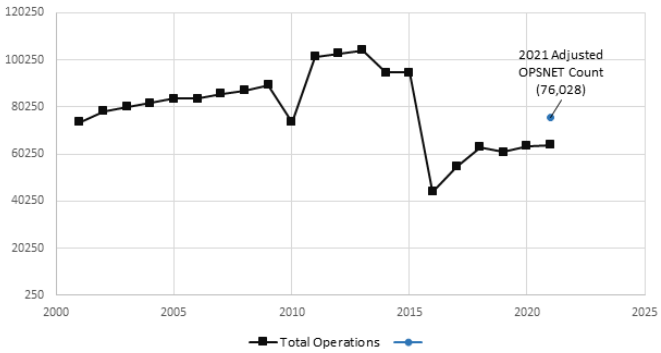


FIGURE 3-4: HISTORICAL TAF – ANNUAL AIRCRAFT OPERATIONS



Source: FAA TAF 2000-2045 (Aurora State Airport) www.taf.faa.gov

COMMUNITY PROFILE

Historical population and economic data for the region was presented in Chapter 2. Long term population and economic forecasts are summarized in **Tables 3-8 and 3-9**. These data are used by local government to project future demand for services, housing, and to effectively manage growth as required by the State of Oregon land use planning law. The forecast population and economic growth within the service area for Aurora State Airport is expected to contribute to increased aviation demand the master planning horizon.

Table 3-8 summarizes the 2021 Portland State University - Population Research Center (PRC) population forecast for the 2021-2041 period that corresponds to the Airport Master Plan. The PRC forecasts are prepared annually. The 2021 forecasts presented were prepared during the second year of the COVID-19 pandemic and account for pandemic-related impacts, as documented at the time. The county and statewide population forecasts for the local area generally project higher rates of annual growth over the next five years, followed by a slowing that accelerates near the end of the forecast horizon. The PRC forecast growth in Clackamas County and in Aurora exceed the projected statewide growth rate; the forecast growth in Marion County trails the forecast statewide growth rate. The City of Aurora urban growth boundary (UGB) population forecast projects annual growth averaging above 2% over the 20-year forecast.

TABLE 3-8: FORECAST POPULATION

	2021	2026	2031	2036	2041
Oregon	4,266,560	4,542,741	4,761,243	4,960,026	5,130,713
CAGR:	-	1.26%	0.94%	0.82%	0.68%
Marion County	347,182	373,010	387,806	399,722	409,506
CAGR:	-	1.45%	0.78%	0.61%	0.48%
Clackamas County	425,316	441,763	464,902	487,724	509,796
CAGR:	-	0.76%	1.03%	0.96%	0.89%
Aurora UGB	1,133	1,193	1,357	1,524	1,695
CAGR:	-	1.04%	2.61%	2.35%	2.15%

Source: PSU Population Research Center (PRC), 2021

Table 3-9 summarizes the current Woods & Poole Economics forecast gross regional product (GRP) for Marion and Clackamas County for the 2021-2041 period that corresponds to the Airport Master Plan. GRP measures the market value of all goods and services produced in the defined region. As indicated in the data, strong GRP growth is forecast over the long term, with a similar slowing near the end of the forecast horizon.

TABLE 3-9: FORECAST GROSS REGIONAL PRODUCT

	2021	2026	2031	2036	2041
Marion County (millions)	$16,761	$18,397	$20,107	$21,874	$23,688
Percent Change	-	9.76%	9.29%	8.79%	8.29%
					CAGR: 1.7%
Clackamas County (millions)	$21,172	$23,348	$25,652	$28,067	$30,590
Percent Change	-	10.28%	9.87%	9.42%	8.99%
					CAGR 1.9%

Source: Woods & Poole Economics, Inc. Washington, D.C. Copyright 2021. Woods & Poole does not guarantee the accuracy of this data. The use of this data and the conclusion drawn from it are solely the responsibility of Century West Engineering, Inc.

Current Aviation Activity

Current based aircraft and annual aircraft operations data for use in developing new aviation activity forecasts are presented in **Tables 3-10 and 3-11**. The 2021 baseline totals will be applied to all 2021-2041 airport master plan forecast models.

TABLE 3-10: BASELINE BASED AIRCRAFT (JANUARY 2022)

Aircraft Type	On-Airport	TTF	Total
Single Engine	45	175	220
Multi Engine	1	14	15
Jet	3	33	36
Helicopter	1	9	10
Total	**50**	**231**	**281**

Source: ODAV Airport Management Count submitted to FAA and accepted by FAA for use as the baseline in the 2021-2041 Airport Master Plan forecast.

TABLE 3-11: BASELINE AIRCRAFT OPERATIONS (2021)

	2021
Itinerant	
Air Taxi	2,006
General Aviation	36,390
Military	79
Subtotal	**38,475**
Local	
General Aviation	37,488
Military	65
Subtotal	**37,553**
Total	**76,028**

Source: Century West Engineering developed using FAA OPSNET Data

2021-2041 Aviation Activity Forecasts

Several based aircraft forecast models were developed using a mix of FAA standard methodologies and other methods commonly used at GA airports with limited and/or unreliable operational activity data, such as is the case at Aurora State Airport to provide a range of projections for comparison. The models rely on a variety of data inputs to identify the most relevant projections. The resulting annual growth rates for all the forecasts are comparable to FAA-accepted growth rates for similar general aviation airports throughout the United States. A preliminary comparison of the models identified the most relevant models based on applicability with Aurora State Airport. Models determined to have less relevance or those that were redundant were discarded and were not included in the accompanying table or graph that identified the recommended forecast.

BASED AIRCRAFT

Seven preliminary based aircraft forecast models were developed during the initial forecasting exercise. Four of these models were discarded to identify the most appropriate projections for evaluation. Three based aircraft forecast models were presented in draft Working Paper No. 1, with annual average growth rates ranging from 0.2% to 1.7%.

During several rounds of coordinated review of Working Paper No. 1 with FAA, the Consultant revised the based aircraft forecast models to respond to specific FAA comments. The extended FAA review process resulted in three based aircraft models for final consideration. Two of the models (National Aerospace Forecast and FAA TAF Federal Contract Tower - Oregon) are maintained unchanged from the original preliminary forecasts and one new model was developed based on the Airport's historical validated based aircraft data reporting (2013 to 2023). One original model (Aurora Historical Hangar Development Trend) was discarded.

The final three preliminary based aircraft forecast models are presented in **Table 3-15** and depicted in **Figure 3-4**. Both can be found at the end of this section. The models reflect annual average growth rates ranging from -1.3% to 1.1%. The forecast models are applied to the 2021 based aircraft baseline (281) originally presented in draft Working Paper No. 1. Descriptions of the discarded forecast models are presented in **Appendix 8.**

National Based Aircraft Inventory Historical Trend Model – The historical validated National Based Aircraft Inventory counts discussed previously (see **Table 3-5**) were used to develop a bottom-up historical trend model for future based aircraft. Bottom-up models differ from top-down models as they begin by determining trends for the individual components of a fleet and forecast them independently to arrive at a sum-of-parts total for the entire fleet. Top-down forecast work in the opposite way, projecting the total fleet first and then dividing that total into the individual components. Generally, a bottom-up forecast provides a more granular view of the based aircraft forecast as it builds individually focused projections for each aircraft type based on how they have changed over time.

Best fit trend lines were calculated for each aircraft type as presented in the adjusted BasedAircraft.com dataset to identify individual historical growth rates for each class of aircraft. Those growth rates were projected forward through the planning period. The total based aircraft counts are the sum of the individual aircraft type estimates over time. This model results in an annual average growth rate of -1.3% The resulting projections of based aircraft are presented in **Table 3-12**.

This model provides a projection of future changes in the Airport's based aircraft fleet that is tied to historical airport-specific reporting. As noted earlier, the bottom-up methodology used in this model provides a reasonable projection that captures the unique trends (positive/negative) experienced at the Airport for each of the four main aircraft categories included in the FAA inventory (single engine, multi-engine, jet, helicopter). This method reflects relevant aircraft-specific trends within the larger data set, rather than applying a single composite rate to the overall based aircraft fleet.

TABLE 3-12: NATIONAL BASED AIRCRAFT INVENTORY HISTORICAL TREND MODEL

	CAGR	2021	2026	2031	2036	2041
Single Engine*	-2.0%	220	199	179	162	146
Multi Engine**	-6.1%	15	11	8	6	4
Jet	1.3%	36	38	41	43	46
Helicopter	3.2%	10	12	14	16	19
Total Based Aircraft	**-1.3%**	**281**	**260**	**242**	**227**	**215**

Source: Century West Engineering
* Includes SETP, LSA, and SE Experimental Aircraft
** Includes METP

Federal Contract Tower (Oregon) TAF Model – This model uses the 2020-2045 Terminal Area Forecast (TAF) Query Data for the group of Oregon airports with federal contract air traffic control towers. The evaluation of a group of operationally similar airports (GA Airports with Federal Contract ATCT facilities within the state of Oregon) provides a larger and more robust dataset, which in turn decreases variability within the data, from which to derive trends.

This model applies the Oregon Federal Contract Tower TAF forecast annual growth rates for total based aircraft to the Airport's baseline based aircraft count, and projected out for the 20-year planning period. The model is non-linear and year-over-year growth rates vary. The model assumes that the Airport's based aircraft fleet growth will be in line with state growth for airports with FAA contract air traffic control towers. The model results in an average annual growth rate of 1.1%. A breakdown of the individual aircraft types and the combined projected totals over the planning period are presented in **Table 3-13**.

This model provides a projection of future changes in the Airport's based aircraft fleet that is consistent with the trends defined by FAA for similar Oregon airports with contract air traffic control towers. Although the projection does not establish an historical statistical relationship between the Airport and the larger data set, this "grouping" method provides a reasonable projection for long term planning. The underlying assumption is that future activity within a group of similar airports that are located in a defined region will be similar, and that on the whole, this activity will be consistent with the FAA's broad expectations defined in its TAF.

TABLE 3-13: FEDERAL CONTRACT TOWER (OREGON) TAF MODEL

	CAGR	2021	2026	2031	2036	2041
Single Engine Piston	0.9%	216	229	240	250	259
Multi Engine Piston	0.0%	6	6	6	6	6
Turbo Prop	1.1%	13	14	15	15	16
Jet	2.3%	36	40	45	50	56
Helicopter	1.4%	10	11	11	12	13
Combined	1.1%	281	300	317	333	350

Source: Century West Engineering

National Aerospace Forecast (Weighted Airport Fleet Mix) Model – The use of an established FAA forecast provides a valid high-level indication of growth rates that is consistent with FAA national expectations for the GA aircraft fleet. More specifically, the adaptation of the FAA forecast recognized different growth expectations defined by FAA for specific aircraft types to tie the projections to the existing based aircraft fleet mix at the Airport.

This model applies the FAA's *National Aerospace Forecast FY 2021-2041* growth rates for each aircraft type to the Airport's existing fleet mix and projects out for the 20-year planning period. The linear projection assumes steady growth that does not change year-over-year during the 20-year forecast. The model accounts for growth differences between aircraft types by weighting rates with the Airport's fleet mix distribution. Aircraft types were summed to get total projected counts for each forecast year. The model assumes that the Airport's based aircraft fleet will grow in parallel to the national fleet. The model results in an average annual growth rate of 0.2%. A breakdown of the individual aircraft types and the combined projected totals over the planning period are presented in **Table 3-14.**

This model provides a reasonable projection of future changes in the Airport's based aircraft fleet that is consistent with the historical analysis and long-term trends defined by FAA for active general aviation and air taxi aircraft in the U.S. fleet. This method assumes that individual airport activity will not deviate significantly from the system-wide forecasts made by FAA that reflect a broad range of national economic and aviation industry factors.

TABLE 3-14: NATIONAL AEROSPACE FORECAST (WEIGHTED AIRPORT FLEET MIX) MODEL

	CAGR	2021	2026	2031	2036	2041
Single Engine Piston	-0.9%	171	163	156	149	142
Multi Engine Piston	-0.4%	6	6	6	6	6
Turbo Prop	0.6%	13	13	14	14	15
Jet	2.3%	36	40	45	50	56
Helicopter	1.4%	10	11	11	12	13
Experimental	1.4%	41	44	47	50	54
Light Sport	4.0%	4	5	6	7	9
Combined	0.2%	281	282	285	289	294

Source: Century West Engineering

RECOMMENDED BASED AIRCRAFT FORECAST

The recommended based aircraft forecast for Aurora State Airport is the **National Based Aircraft Inventory Historical Trend Model**. This model is based on a relatively long history (9 years for jets, 11 years for all other classes) of FAA validated aircraft counts for the Airport. The data were adjusted to account for observed irregularities using the best methods available. The forecast uses a bottom-up methodology, which is preferable when forecasting individual groups within a larger data set.

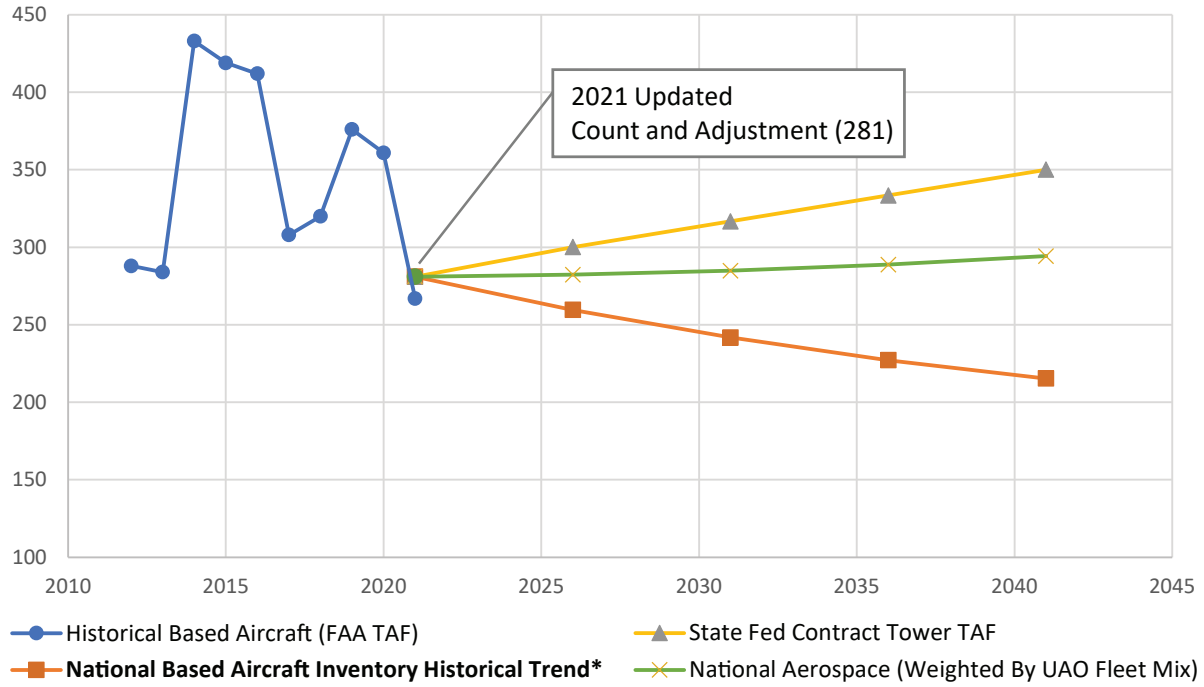
The recommended forecast has an overall growth rate of -1.3%, which results in a decline of 66 aircraft over the 20-year planning period. The decrease in total aircraft is driven primarily by a loss of single engine aircraft. Considering the Airport's constrained site, and limited available space for new hangar development – both on-airport and TTF – it is reasonable to expect that as more jets arrive at the Airport, the demand for higher priced, low density aircraft storage (hangars) to accommodate expensive jet aircraft will displace the lower-revenue producing, higher-density storage for small single engine piston aircraft. The based aircraft forecast models presented for consideration, including the recommended model, are summarized in **Table 3-15** and depicted in **Figure 3-5**.

TABLE 3-15: FORECASTS OF BASED AIRCRAFT

Based Aircraft Forecast Models	CAGR	2021	2026	2031	2036	2041
National Based Aircraft Inventory Historical Trend*	**-1.3%**	**281**	**260**	**242**	**227**	**215**
State Fed Contract Tower TAF	1.1%	281	300	317	333	350
National Aerospace (Weighted By UAO Fleet Mix)	0.2%	281	282	285	289	294

Source: Century West Engineering
*Recommended Based Aircraft Forecast

FIGURE 3-5: BASED AIRCRAFT FORECASTS



Source: Century West Engineering, FAA TAF, FAA National Aerospace Forecasts
Historical National Based Aircraft Inventory annual counts were reported for January 1 of each year. Those counts have been applied to the end of the previous year to match the timing of 2021 base year count.
*Recommended Forecast

Based Aircraft Fleet Mix

Understanding the current and projected composition (fleet mix) of the based aircraft fleet enables the Airport to understand the current and future facility needs of the local users. As the preferred forecast is a bottom-up historical trend model, individual aircraft types are projected across the planning period based on documented histories of the aircraft based at Aurora State Airport. It should be noted that historical based aircraft counts provided in the FAA's National Based Aircraft Inventory data are categorized as Single-Engine, Multi-Engine, Jet, and Helicopter. Single-engine turboprop, light sport, and experimental (fixed wing single-engine propeller). are included in the Single-Engine category, and multi-engine turboprop aircraft are included in the Multi-Engine category.

Table 3-16 summarizes the current and forecast fleet mix for the planning period. The based aircraft fleet mix at Aurora State Airport is expected to become slightly more diverse as it is anticipated that single-engine piston aircraft will be retired over time and/or replaced by jet aircraft as described previously. It is also reasonable to anticipate that a portion of the single-engine fleet is likely to be replaced by LSA or experimental kit aircraft, following national trends. The continued addition of locally based turbine-engine aircraft (turboprop, jet, helicopter, etc.) is also anticipated based on historic trends and the FAA's long term general aviation fleet forecast, which reflects the continued adoption of turbine engine technology.

TABLE 3-16: FORECAST BASED AIRCRAFT FLEET MIX

	CAGR	2021	2026	2031	2036	2041
Single Engine*	-2.0%	220	199	179	162	146
Multi Engine**	-6.1%	15	11	8	6	4
Jet	1.3%	36	38	41	43	46
Helicopter	3.2%	10	12	14	16	19
Total Based Aircraft	**-1.3%**	**281**	**260**	**242**	**227**	**215**

Source: Century West Engineering
* Includes SETP, LSA, and SE Experimental Aircraft
** Includes METP

AIRCRAFT OPERATIONS

Eleven preliminary aircraft operations forecast models were developed during the initial forecasting exercise. Six of these models were discarded to identify the most appropriate projections for evaluation. Five aircraft operations forecast modes were presented in draft Working Paper No. 1, with annual average growth rates ranging from 0.6% to 3.6%.

During several rounds of coordinated review of Working Paper No. 1 with FAA, the Consultant revised the aircraft operations forecast models to respond to specific FAA comments. The extended FAA review process resulted in four aircraft operations models for final consideration. Two of the models (National Aerospace Forecast and FAA TAF Federal Contract Tower - Oregon) are maintained unchanged from the original preliminary forecasts; two models (TFMSC and Marion County Population) were significantly revised; and one model (Aurora Historical ATCT Trend) was discarded.

The final four preliminary aircraft operations forecast models are presented in **Table 3-17** and depicted in **Figure 3-6**. The models reflect annual average growth rates ranging from 0.6% to 1.6%. The forecast models are applied to the 2021 aircraft operations baseline (76,028) originally presented in draft Working Paper No. 1. Descriptions of the discarded forecast models are presented in **Appendix 8**.

Hybrid TFMSC Itinerant/FAA National Aerospace Forecast GA Local Operations Model – An earlier iteration of this model began with a 20-year (2001-2021) trend of TFMSC instrument flight plan data for the Airport. It was intended to establish a projected growth rate for the period. This revised model assumed that future itinerant operations at the Airport will follow the 20-year trend defined for the Airport by available TFMSC data, and that growth in local operations at the Airport will be consistent with the FAA's 2022-2042 National Aerospace Forecast for airports with contract air traffic control towers. The use of the national forecast at Aurora State Airport is considered to provide a reasonable projection that is in line with broader FAA expectations for this type of general aviation activity. Itinerant and local splits were based on 2021 operations counts. Operational impacts experienced during the COVID-19 pandemic appear to dampen the overall trend. This early iteration yielded a reasonable correlation between the historical data to the derived trend line (R-squared = 0.72). The model resulted in an average annual growth rate of 2.4%.

Although the TFMSC 20-year trend is a good indicator of itinerant activity, local operations are not captured in the TFMSC data. Based on this consideration, it was determined the model should be augmented to account for local activity, which includes predominantly airport traffic pattern activity conducted in visual flight rules (VFR) conditions.

Normally at a towered airport such as Aurora State Airport, a trend analysis of historical ATCT local operations would provide a reasonable indication of future growth potential. However, two unique factors significantly limit the ability to generate reliable airport-specific trend analyses for this forecast:

1. Limited Data Range. The limited number of years of ATCT operations (2016-forward) provides a reliable indication of individual year historical activity but does not provide a sufficient span of time needed to define reliable trends to build future activity projections. This is highlighted within the overall ATCT data, where local operations have experienced several significant upward and downward fluctuations during this period.

2. COVID-19. The FAA recognizes that the COVID-19 pandemic and the ongoing post-COVID recovery have created significant forecast uncertainty throughout the U.S. civil aviation system that reduces the level of confidence normally associated with airport master plan forecasting. The impacts of COVID-19 on activity at Aurora State Airport are reflected in the ATCT historical operations counts noted above, and they contribute to annual data that fails to define a reliable trend that can be used to project future aircraft flight activity.

Since the ATCT opened, Aurora State Airport has experienced strong growth in local operations increasing at an annual rate of over 18% between 2016 and 2021. ATCT personnel interviewed as part of this study indicated that most of this growth can be attributed to flight training, specifically airport traffic pattern activity associated with flight training (touch and go operations, etc.). However, several factors were noted suggesting that recent growth is not sustainable at the current rate. ATCT personnel stated that they regularly deny access to the Class D (controlled) airspace to incoming aircraft due to congestion in the pattern and the need to accommodate other air traffic (e.g., inbound, outbound aircraft on instrument flight plans, etc.). This was further corroborated in interviews with flight school operators who stated that they have been denied access to the airspace by the ATCT due to congestion. Locally based flight schools also report that the ATCT will limit aircraft access to the traffic pattern (for touch and goes, etc.) for aircraft planning their flights from the Airport, when the area is congested.

To address the above-described issues, a new hybrid aircraft operations forecast model was developed that uses separate growth rates for itinerant and local operations. The individual rates are applied to the 2021 baseline local and itinerant operations totals to develop the 20-year forecast. The use of a hybrid model accounts for the distinction in local and itinerant operations commonly found at general aviation (GA) airports.

Itinerant operations are projected to increase at an average annual rate of 2.4% between 2021 and 2041. This growth rate reflects the long-term (2001-2021) historical trend defined for instrument flight plan-related operations at Aurora State Airport documented in the FAA TFMSC data.

Local operations are projected to increase at an average annual rate of 0.7% between 2021 and 2041. This growth rate is consistent with the FAA's 2022-2042 National Aerospace Forecast growth rate defined for General Aviation Local Operations at Airports with FAA and Contract Air Traffic Control Service. As noted above, the use of a national FAA forecast growth rate appears to be the best available method for projecting local aircraft operations at Aurora State Airport due to the strong fluctuations in local activity experienced at the Airport since the ATCT operation began, making localized trend analysis unreliable. The varied impacts in activity at Aurora State Airport that are generally attributed to the COVID-19 pandemic further underscore the inability to define reliable operations projections based on a limited range of data that experienced significant inconsistencies. This model results in an average annual growth rate of 1.6%.

This hybrid model combines airport-specific activity data and national trend data to reflect the distinctly different drivers of local and itinerant aircraft operations at the Airport. The trend analysis of TFMSC data provides a reasonable indication of future growth rates for itinerant activity at the Airport, including definition of the future critical aircraft. In contrast, the limited range of the Airport's available air traffic control tower (ATCT) operations data and the unprecedented fluctuations in activity that occurred during the period due to COVID-19, have the potential of significantly skewing any resulting projections. These limitations support the use of a broader measure of local flight activity contained in existing FAA national forecasts that can be combined with airport-specific (TFMSC) data that are not affected by ATCT data limitations.

Marion and Clackamas County Combined Population Growth Model – The use of regional socioeconomic conditions as an indicator of aviation activity at an airport is a generally accepted practice in instances where historical operations data are limited, such as at Aurora State Airport. The model assumes that total airport operations will track with the combined population of Marion and Clackamas Counties.

The Airport is located in Marion County, less than a mile from the Marion/Clackamas County boundary, and over 75% of the 30-minute drive time service area (see Figure 2-2) is in these counties. It is reasonable to assume that the combined population of Marion and Clackamas Counties may serve as a representative surrogate for operations at Aurora State Airport since population in the area indicates the number of persons served by the Airport, and therefore the potential customer base utilizing airport services including air taxi, flight training, and general GA services.

The model combines the Portland State University (PSU) Population Research Center (PRC) population forecasts for Marion and Clackamas Counties over the planning period. The compound average growth rate of the combined dataset was calculated and applied to the Airport's 2021 baseline aircraft operations total. The model results in an average annual growth rate of 0.9%.

This model provides a projection of future aircraft operations that effectively mirrors the forecast population growth for the two primary counties in the Airport's service area. Although limited airport operations data prevents more complex statistical analyses, in broad terms, the relationship between community growth and airport activity is generally consistent. The model assumes that changes in airport activity will be similar to the anticipated growth in the local area.

National Aerospace Forecast Operations (Airports with ATCT) – This model applies the *National Aerospace Forecast FY2021-2041* "Total Combined Aircraft Operations at Airports with FAA and Contract Traffic Control Service" forecast 2021-2041 growth rates for all aircraft categories to the Airport's baseline operation counts and projects out 20 years. This model assumes that airport operations will grow at a rate similar to forecast population growth within its primary service area. Resulting operations by aircraft type were summed to get total operations for each year in the forecast. Aircraft categories were combined into Local and Itinerant totals based on the splits from baseline. The model assumes that the Airport operations will mirror national trends. The model results in an average annual growth rate of 0.8%.

This model provides a reasonable projection of future changes in the Airport's annual aircraft operations that is consistent with the historical analysis and long-term trends defined by FAA for towered airports in the U.S. fleet. This method assumes that individual airport activity will not deviate significantly from the system-wide forecasts made by FAA that reflect a broad range of national economic and aviation industry factors.

Federal Contract Tower TAF State (Oregon) Model – This model applies the Oregon Federal Contract Tower TAF forecast annual growth rates for aircraft classifications to Aurora State Airport's baseline operations counts (using the same classifications) over the 20-year period. The model assumes that operations at the Airport will be consistent with FAA's Terminal Area Forecast (TAF) for Oregon airports with contract air traffic control towers. This model provides a more focused regional assessment within the TAF, compared to the TAF national model for contract tower airports, as these airport are the most operationally similar to Aurora State Airport in the state. The model is non-linear and year-over-year growth rates vary. The model assumes that the Airport's operations will mirror state trends. The model results in an average annual growth rate of 0.6%.

This model provides a projection of future changes in the Airport's annual aircraft operations that is consistent with the trends defined by FAA for similar Oregon airports with contract air traffic control towers. Similar to the contract tower model used for based aircraft forecasting, this projection does not establish an historical statistical relationship between the Airport and the larger data set, although it does provide a reasonable projection for long term planning. The underlying assumption is that future activity within a group of similar Oregon contract towered airports will be similar, and that on the whole, this activity will be consistent with the FAA's broad expectations defined in its TAF.

RECOMMENDED AIRCRAFT OPERATIONS FORECASTS SUMMARY

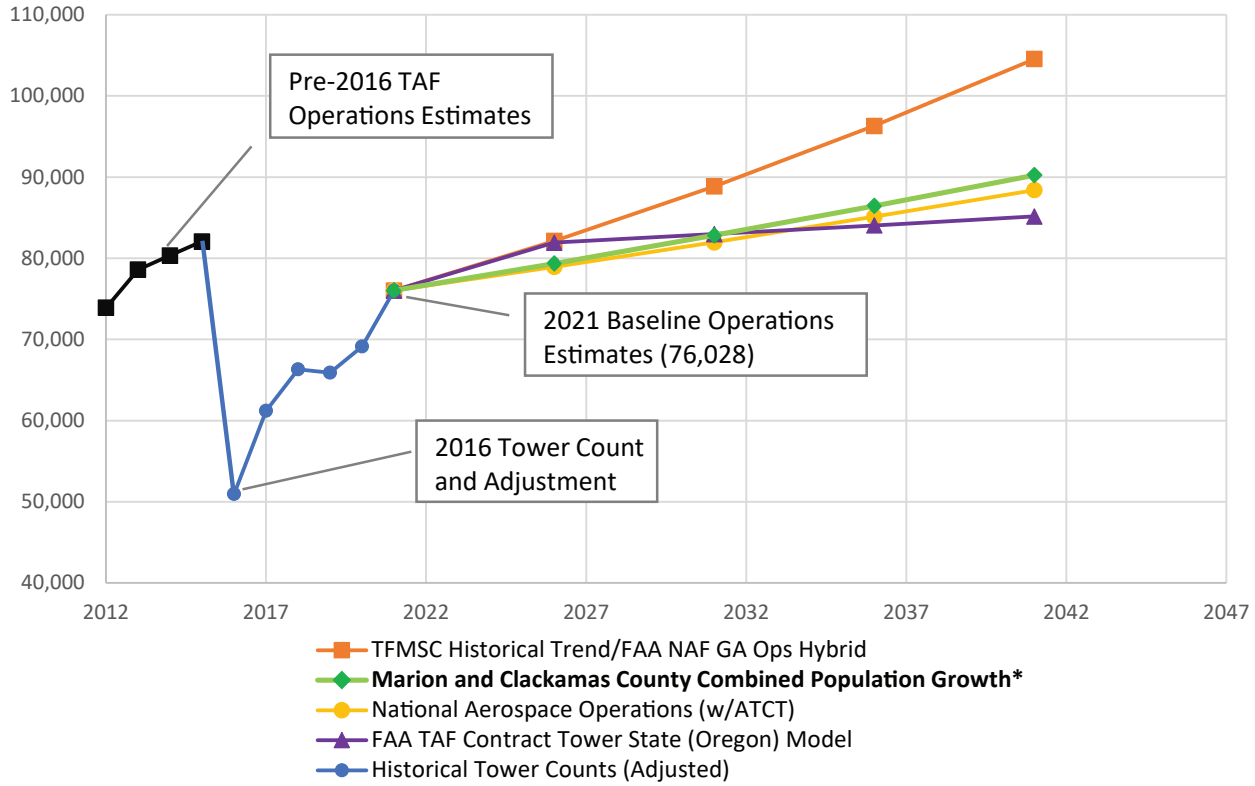
The Marion and Clackamas County Combined Population Growth Model is the recommended aircraft operations forecast for the 2021-2041 Aurora State Master Plan. In lieu of representative operational data specific to the Airport, population growth forecasts developed for the two counties most contributing to the Airport service area were selected to indicate future operational activity. The model assumes that operations will track with the local population as it reflects the number of people likely to use airport services. This model reflects the best data available considering the limitations of the available ATCT traffic counts. The model projects an average annual growth rate of 0.9% over the planning period. The aircraft operations forecast models are included in **Table 3-17** and depicted in **Figure 3-6**.

TABLE 3-17: OPERATIONS FORECAST

	CAGR	2021	2026	2031	2036	2041
TFMSC Historic Trend/FAA NAF GA Ops Hybrid	1.6%	76,028	82,123	88,855	96,298	104,537
Marion and Clackamas County Combined Population Growth*	**0.9%**	**76,028**	**79,354**	**82,825**	**86,449**	**90,230**
National Aerospace Operations (w/ ATCT)	0.8%	76,028	78,939	81,966	85,114	88,388
FAA TAF Contract Tower State (Oregon) Model	0.6%	76,028	81,924	82,972	84,046	85,151

Source: Century West Engineering developed using FAA TFMSC Data
* Denotes recommended forecast

FIGURE 3-6: OPERATIONS FORECAST MODELS



Source: Century West Engineering using FAA TAF, FAA OPSNET, and FAA National Aerospace Forecast Data
* Denotes recommended forecast

AIRCRAFT OPERATIONS FLEET MIX AND SPLITS

The distribution of total operational activity attributed to each of the five primary types of aircraft – single engine piston, multi-engine piston, turboprop, jet, and helicopter – is called the fleet mix. An understanding of the current and projected fleet mixes enables airports to plan for improvements to accommodate for growth or decline in activity by the specific aircraft type.

The fleet mix is derived from the current and projected operations totals established in the existing conditions analysis (base year counts) and the preferred forecast (projected estimates). ATCT operations counts do not distinguish between the individual aircraft types. So, fleet mix shares are estimated based on ancillary information, including TFMSC data, national trends, and input from knowledgeable sources such as ATCT controllers.

The base year fleet mix was estimated starting with the total operations in 2021. TFMSC data provides counts of aircraft arriving at or departing Aurora State Airport with a filed IFR flight plan and classifies those counts by aircraft type. The vast majority of jets and turboprop operations are executed with an IFR flight plan and are captured by the TFMSC data. As such, the TFMSC jet and turboprop operations totals were used as the respective fleet mix splits. Jet operations were further split by weight categories based on a review of the base year TFMSC data.

While some helicopters operate under IFR flight plans, that is not the case for all. So TFMSC helicopter counts are not representative of the activity on the airfield. Discussions with the ATCT manager indicated that helicopter operations (not including off-site operators) account for approximately 1% of the total operations. As this was the best information available, a 1% split of total operations was attributed to helicopter activity.

Having accounted for jets, turboprops, and helicopters, the remaining operations can be attributed to piston aircraft. However, there are no definitive data sources that differentiate between single engine and multi engine piston aircraft operations. So as a planning estimate, the remaining unclassified operations were split according to the ratio of single-engine piston to multi-engine piston aircraft based at Aurora State Airport (96.6% SEP/3.4% MEP).

To estimate future fleet mix, the base year mix developed above was projected through the planning period as follows. Turboprop and total jet operations were based on a 20-year TFMSC trend for each respective aircraft. Projected total jet operations were further split by weight categories as follows. Best fit trend lines were derived for operations by jets 12,500 lbs and less, and by jets greater than 60,000 lbs. The trend line for jets greater than 60,000 lbs excluded the 2021 count (92) as it was over twice the average of the annual totals for the previous 5 years and could be attributed to a single aircraft that began operating at the Airport over the previous year. As such, it was determined to be not representative of the overall historical trend and was removed. The derived trends were applied to the base counts for the two jet weight categories and projected over the planning period. All jet operations not accounted for by these projections were attributed to jets between 12,500 lbs and 60,000 lbs. Growth rates developed in the FAA National Aerospace Forecasts (General Aviation, Hours Flown) were applied to helicopters and multi-engine piston aircraft. All remaining operations not accounted for in each projected year were attributed to single-engine piston aircraft.

The aircraft operations fleet mix forecast is summarized in **Table 3-18**. Activity splits (local, itinerant, etc.) for forecast operations are summarized in **Table 3-19**.

TABLE 3-18: OPERATIONS FLEET MIX

Aircraft Type	CAGR	2021	2026	2031	2036	2041
Total Airport Operations	**0.9%**	**76,028**	**79,354**	**82,825**	**86,449**	**90,230**
Single Engine Piston*	-0.2%	65,319	66,066	66,096	65,124	62,762
Multi Engine Piston	-0.3%	2,299	2,265	2,231	2,198	2,165
Turbo Prop	6.8%	2,628	3,652	5,074	7,050	9,796
Jet	5.4%	5,022	6,533	8,497	11,053	14,378
12,500 lbs or Less	2.3%	842	943	1,057	1,184	1,327
Greater than 12,500 lbs and up to 60,000 lbs	6.2%	4,088	5,464	7,271	9,639	12,739
Greater than 60,000 lbs	6.3%	92	125	169	230	312
Helicopter	2.0%	760	839	927	1,023	1,130
Fleet Mix Percentages						
Single Engine*		85.9%	83.3%	79.8%	75.3%	69.6%
Multi Engine Piston		3.0%	2.9%	2.7%	2.5%	2.4%
Turbo Prop		3.5%	4.6%	6.1%	8.2%	10.9%
Jet		6.6%	8.2%	10.3%	12.8%	15.9%
12,500 lbs or Less		1.1%	1.2%	1.3%	1.4%	1.5%
Greater than 12,500 lbs and up to 60,000 lbs		5.4%	6.9%	8.8%	11.1%	14.1%
Greater than 60,000 lbs		0.1%	0.2%	0.2%	0.3%	0.3%
Helicopter		1.0%	1.1%	1.1%	1.2%	1.3%

Source: Century West Engineering
*Includes LSA/Experimental Aircraft

TABLE 3-19: RECOMMENDED OPERATIONS FORECAST

TFMSC Historic Trend/FAA NAF Hybrid	CAGR	2021	2026	2031	2036	2041
Itinerant						
Itinerant Air Taxi	2.5%	2,006	2,056	2,108	2,160	2,214
Itinerant GA	2.1%	36,390	37,154	37,934	38,731	39,544
Itinerant Military	0.0%	79	79	79	79	79
Itinerant Total	**0.4%**	**38,475**	**39,289**	**40,121**	**40,970**	**41,838**
Local						
Local GA	1.3%	37,488	40,000	42,639	45,413	48,328
Local Military	0.0%	65	65	65	65	65
Local Total	**1.3%**	**37,553**	**40,065**	**42,704**	**45,478**	**48,393**
Total Operations	**0.9%**	**76,028**	**79,354**	**82,825**	**86,449**	**90,230**

Source: Century West Engineering developed using FAA ATCT Data

Operational Peaks

Activity peaking is evaluated to identify potential capacity related issues that may need to be addressed through facility improvements or operational changes. The Peak Month represents the month of the year with the greatest number of aircraft operations (takeoffs and landings). The Peak Month for most general aviation airports occurs during the summer when weather conditions and daylight are optimal. This also coincides with the busiest time of year for flight training and recreational flying. A review of FAA OPSNET ATCT operations counts identified July as the Peak Month in 2021, which accounted for 11.4% of annual operations.

The Design Day is a calculated metric that is representative of an average day in the peak month, which is calculated by dividing the total peak month operations by 30.5. The peak activity period in the Design Day is the Design Hour. For planning purposes, the Design Hour operations are estimated to account for 20% of Design Day operations.

Also of interest is the Peak Day. The Peak Day represents the busiest day that the airport experiences in a year. The Peak Day may or may not fall within the Peak Month. A review of the OPSNET Peak Day report identified June 16 as the Peak Day in 2021.

The operational peaks for each forecast year are summarized in **Table 3-20**. This level of peaking is consistent with the mix of airport traffic and is expected to remain relatively unchanged during the planning period. These measures of activity are considered in the facility requirements analyses when calculating runway/taxiway capacity and transient aircraft parking requirements.

TABLE 3-20: PEAK OPERATIONS

	2021	2026	2031	2036	2041
Annual Operations	**76,028**	**79,354**	**82,825**	**86,449**	**90,230**
Peak Month Operations*†	8,699	9,080	9,477	9,891	10,324
Design Day Operations (Average Day in Peak Month)	285	298	311	324	338
Peak Day Operations*††	459	479	500	522	545
Design Hour Operations (Assumed 20% of Design Day)	57	60	62	65	68

Source: Century West Engineering
* Adjusted OPSNET Data
† 2021 Peak Month identified as July
†† 2021 Peak Day identified as June 16

Design Aircraft

The design aircraft (or critical aircraft) represents the most demanding aircraft, or family of aircraft with similar characteristics, using an airport on a regular basis and determines the appropriate AAC/ADG and airport design standards for airport development. It is widely understood that the most demanding aircraft operating at Aurora State Airport are Jets. FAA AC 150/5000-17, Critical Aircraft and Regular Use Determination states that counts of jet operations provided by TFMSC data, once normalized as described previously, are considered representative of the total operations of this aircraft type which nearly always operates on IFR flight plans.

As noted in Chapter 2 - Existing Conditions Analysis, TFMSC data shows that an existing critical aircraft with an AAC of C and an ADG of II (herein referred to as C-II) is justified based on the 500 annual operations requirement. While operations by C-II aircraft specifically do not reach the threshold, there are more than 500 annual operations by AAC C aircraft and ADG II aircraft which meets the requirement.

To determine the future critical aircraft, the 2021 TFMSC operations by all AAC C and D aircraft, and all ADG II and II aircraft were projected forward across the 20-year planning period based on 20-year historical trends derived from TFMSC data. According to these projections, operations by C-II aircraft will remain below the 500 operations threshold through the planning period. However, similarly to the existing critical aircraft, there are sufficient operations separately by AAC C and ADG II aircraft to justify a future critical aircraft with an AAC of C and ADG of II (C-II). Sufficient operations by AAC D or ADG III aircraft are not anticipated to occur in the 20-year term. **Table 3-21** summarizes projected operations by AAC and ADG.

TABLE 3-21: AAC/ADG 20-YEAR PROJECTION

	CAGR	2021	2026	2031	2036	2041
C-II	0.8%	264	275	286	298	310
AAC C	**2.3%**	**538**	**603**	**675**	**757**	**848**
AAC D	-9.4%	102	62	38	23	14
AAC C & D	1.5%	640	665	713	780	862
ADG II	9.9%	5,928	9,504	15,236	24,427	39,162
ADG III	7.6%	10	14	21	30	43
ADG II & III	9.9%	5,938	9,518	15,257	24,457	39,205

Source: Century West Engineering using FAA TFMSC data (2002-2021)

The existing and future design aircraft identified in the aviation activity forecasts corresponds to Aircraft Approach Category C and Airplane Design Group II.

- 2021 TFMSC data[1] indicates that Aircraft Approach Category C operations exceeded the minimum of 500 annual operations required for Design Aircraft designation. This activity represents the most demanding family of high performance jet aircraft regularly operating at the Airport.
- Airplane Design Group II or larger aircraft operations also exceeded the 500 operations threshold required for Design Aircraft designation.
- AAC and ADG are independently justified through current activity levels, and the AAC/ADG C-II designation most accurately represents this segment of aircraft activity.
- Specific facility requirements, such as runway length requirements will be derived from the composite of Approach Category C and D jet aircraft reflected in FAA runway length planning tables.

1 Raw TFMSC data included in Appendix 8

Design Aircraft - Bombardier Challenger 601

Table 3-22 summarizes FAA technical criteria used to determine the applicable AAC/ADG for aircraft based on physical characteristics; representative aircraft are also depicted.

TABLE 3-22: REPRESENTATIVE DESIGN AIRCRAFT BY AAC AND ADG

Aircraft Approach Category	Aircraft Approach Speed knots	Airplane Design Group	Aircraft Wingspan
A	less than or equal to 91	I	less than or equal to 49’
B	92 to 121	II	50’ to 79’
C	122 to 141	III	80’ to 118’
D	142 to 166	IV	119’ to 171’

A-I
12,500 lbs. or less

Beech Baron 55
Beech Bonanza
Cessna 182
Piper Archer

B-I(small)
12,500 lbs. or less

Beech Baron 58
Beech King Air C90
Cessna 402
Cessna 421

A-II, B-II
12,500 lbs. or less

Super King Air 200
Pilatus PC-12
DHC-6 Twin Otter
Cessna Caravan

ARC - B-II
Greater than 12,500 lbs.

Super King Air 300, 350
Beech 1900
Cessna Citation
Falcon 20, 50

A-III, B-III
Greater than 12,500 lbs.

DHC Dash 7, Dash 8
Q-200, Q-300
DC-3
Convair 580

C-I, D-I

Lear 25, 35, 55, 60
Israeli Westwind
HS 125-700

C-II, D-II

Gulfstream II, III, IV
Challenger 601
Lockheed JetStar

C-III, D-III

Boeing Business Jet
Gulfstream 650
B 737-300 Series
MD-80, DC-9

C-IV, D-IV

B - 757
B - 767
DC - 8-70
DC - 10

Source: Century West Engineering

Military Activity

Air traffic control tower counts for the Airport average 248 annual military operations since 2016, although the volume has decreased to less than 150 annual operations over the last two years. Occasional military use with helicopters or small fixed-wing aircraft in support of emergency response, search and rescue, and flight training activities would be consistent with activity (Oregon Army National Guard, etc.) experienced at other Oregon general aviation airports. Military flight activity at the Airport is projected to remain at current levels, with a static projection of 144 annual operations during the planning period. Forecast military activity is included in **Table 3-23**.

Air Taxi Activity

Air taxi activity includes for-hire charter flights, medevac flights, and some scheduled commercial air carriers operating under FAR Part 135. Air taxi activity at Aurora State Airport is forecast to increase at the same rate as itinerant general aviation operations. Forecast air taxi activity is included in **Table 3-23** (forecast summary).

Forecast Summary

A summary of the based aircraft and annual aircraft operations is presented in **Table 3-23**. These forecasts project slight to modest growth over the 20-year planning period that is consistent with FAA's long-term expectations for general aviation in the region. Based aircraft are forecast to decrease at an average annual rate of -1.3% between 2021 and 2041, reflecting a continued reduction in the number of small single-and multi-engine piston aircraft that is partially offset by growth in turbine fixed wing aircraft and helicopters. Aircraft operations are forecast to increase at an average annual rate of 0.9% between 2021 and 2041. The forecasts reflect the Airport's ability to attract and accommodate both locally based and transient aeronautical activity from a diverse group of users, including flight training, recreational aviation, personal travel, and business aviation.

TABLE 3-23: FORECAST SUMMARY

Activity	CAGR	2021	2026	2031	2036	2041
Based Aircraft						
Single Engine*	-2.0%	220	199	179	162	146
Multi Engine**	-6.1%	15	11	8	6	4
Jet	1.3%	36	38	41	43	46
Helicopter	3.2%	10	12	14	16	19
Total Based Aircraft	**-1.3%**	**281**	**260**	**242**	**227**	**215**
Aircraft Operations						
Itinerant						
Itinerant Air Taxi	2.5%	2,006	2,056	2,108	2,160	2,214
Itinerant GA	2.1%	36,390	37,154	37,934	38,731	39,544
Itinerant Military	0.0%	79	79	79	79	79
Itinerant Total	**0.4%**	**38,475**	**39,289**	**40,121**	**40,970**	**41,838**
Local						
Local GA	1.3%	37,488	40,000	42,639	45,413	48,328
Local Military	0.0%	65	65	65	65	65
Local Total	1.3%	37,553	40,065	42,704	45,478	48,393
Total Operations	**0.9%**	**76,028**	**79,354**	**82,825**	**86,449**	**90,230**
Aircraft Operations Fleet Mix						
Single Engine*	-0.2%	65,319	66,066	66,096	65,124	62,762
Multi Engine Piston	-0.3%	2,299	2,265	2,231	2,198	2,165
Turbo Prop	6.8%	2,628	3,652	5,074	7,050	9,796
All Jets	5.4%	5,022	6,533	8,497	11,053	14,378
Jets 12,500 lbs or Less	2.3%	842	943	1,057	1,184	1,327
Jets 12,501 lbs and up to 60,000 lbs	6.2%	4,088	5,464	7,271	9,639	12,739
Jets Greater than 60,000 lbs	6.3%	92	125	169	230	312
Helicopter	2.0%	760	839	927	1,023	1,130
Total Operations	0.9%	76,028	79,354	82,825	86,449	90,230
Operations By C-II (Critical Aircraft)	0.8%	264	275	286	298	310
Operations by AAC C & D	1.5%	640	665	713	780	862
Operations by ADG II & Larger	9.9%	5,938	9,518	15,257	24,457	39,205
Instrument Operations	2.7%	9,443	10,789	12,326	14,082	16,089

Source: Century West Engineering
*Includes Experimental/LSA

TERMINAL AREA FORECAST (TAF) COMPARISON

The recommended based aircraft and aircraft operations forecasts are compared to the current TAF as required for FAA review in **Table 3-24**.

TABLE 3-24: AIRPORT PLANNING AND TAF FORECAST COMPARISON

Activity	Year	Airport Forecast	TAF	AF/TAF (% Difference)
Passenger Enplanements				
Base yr.	2021	0	0	0.0%
Base yr. + 5yrs.	2026	0	0	0.0%
Base yr. + 10yrs.	2031	0	0	0.0%
Base yr. + 15yrs.	2036	0	0	0.0%
Commercial Operations				
Base yr.	2021	2,006	1,727	16.2%
Base yr. + 5yrs.	2026	2,056	1,845	11.4%
Base yr. + 10yrs.	2031	2,108	1,967	7.1%
Base yr. + 15yrs.	2036	2,160	2,097	3.0%
Total Operations				
Base yr.	2021	76,028	76,794	-1.0%
Base yr. + 5yrs.	2026	79,354	78,053	1.7%
Base yr. + 10yrs.	2031	82,825	79,109	4.7%
Base yr. + 15yrs.	2036	86,449	80,198	7.8%

Source: Century West Engineering
Note: TAF data is on a U.S. government fiscal year basis (October through September).

Next Steps

The draft aviation activity forecasts will be submitted to the FAA Seattle Airports District Office (ADO) for formal review following presentation and discussion of the chapter in Planning Advisory Committee (PAC) Meeting 2.

Upon FAA approval of the forecasts, the current and future design aircraft will be used in subsequent airport master plan technical evaluations and definition of airport design standards and airspace planning standards. These designations will include the appropriate design criteria, including Aircraft Approach Category (AAC), Airplane Design Group (ADG) and Taxiway Design Group (TDG) to be used in the 2021-2041 Airport Master Plan.

The approved aviation activity forecasts will be used to evaluate the aeronautical facility requirements for the Airport in the following chapter (Chapter 4 – Facility Requirements). The facility requirements evaluation will quantify current and future facility needs in general terms and volume.

North Hangar Area (On Airport and Through the Fence) – Source: Century West Engineering

Chapter 4

Facility Goals and Requirements

Introduction

Facility goals and requirements were developed based on the data presented in the earlier draft Airport Master Plan chapters and the information obtained from project stakeholders during Planning Advisory Committee (PAC) Meetings #1 and #2, Open House #1, and other PAC work sessions. The FAA-approved aviation activity forecasts, presented in Revised (November 2023) Working Paper No. 1 (Chapter 3), were used to identify the current and future Design Aircraft and their corresponding runway design codes (RDC), and to quantify demand-driven facility needs such as aircraft parking, hangar space and airport capacity. All airfield facility requirements definitions used in this chapter are based on Federal Aviation Administration (FAA) airport design and airspace planning standards.

The facility goals and requirements evaluation process is designed to identify the adequacy of existing airport facilities to meet future demand. The evaluation uses established planning criteria to define future facility needs for the Aurora State Airport (Airport) through the current 20-year planning period. This evaluation is performed within the framework of the Regional Setting, Airside, Landside, and Airport Administration elements for the Airport. The next step in the airport master planning process will be to translate the broadly defined facility needs into specific facility improvement options capable of addressing the projected facility requirements.

The proposed goals and requirements were developed in coordination with Oregon Department of Aviation (ODAV) staff for presentation to the PAC, other project stakeholders, and the general public for review and comment during PAC Meetings, Open Houses, and on the project website. These represent the goals, objectives, and facility improvements required to satisfy future aviation demand, while also addressing broader issues affecting the Aurora State Airport.

- FACILITY GOAL. Represents the goals, policies, and objectives developed in response to the issues/opportunities identified during the planning process.
- FACILITY REQUIREMENT. Represents the facility needs and/or improvements required to satisfy identified capacity/demand requirements, FAA standards, and applicable state laws.

Design Aircraft and Airport Design Standards Discussion

The existing and future design aircraft are determined based on the current and projected level of activity described in Chapter 3 – Aviation Activity Forecasts. The design aircraft establishes existing and future airport planning and design standards that will guide future planning, design, and improvement of the Airport.

DESIGN AIRCRAFT AND FAA REFERENCE CODE

The design aircraft designation is intended to represent the most demanding aircraft using the Airport on a regular basis when establishing the AAC/ADG for airfield planning and design purposes. FAA defines "regular" use as 500 annual operations. Operations by larger or more demanding aircraft may be accommodated based on facility capabilities or limitations. Example aircraft are presented in **Figure 4-1**.

As discussed in Chapter 3 – Aviation Activity Forecasts, the existing and future design aircraft identified for the Airport is a medium-sized business jet included in Aircraft Approach Category C/Airplane Design Group II (AAC/ADG C-II). The Canadair 600 (CL60), per the FAA Aircraft Characteristics Database, is representative of the segment of business jet activity associated with AAC/ADG C-II.

FIGURE 4-1: SAMPLE OF TYPICAL AIRCRAFT AND DESIGN AIRCRAFT AT THE AURORA STATE AIRPORT

A-I (small) 12,500 lbs. or less

Beech Baron 55
Beech Bonanza
Cessna 182
Piper Archer

B-I (small) 12,500 lbs. or less

Beech Baron 58
Beech King Air C90
Cessna 402
Cessna 421

A-II, B-II (small) 12,500 lbs. or less

Super King Air 200
Pilatus PC-12
DCH Twin Otter
Cessna Caravan

AAC/ADG - B-II Greater than 12,500 lbs.

Super King Air 300, 350
Beech 1900
Cessna Citation Excel
Falcon 20, 50

A-III, B-III Greater than 12,500 lbs.

DHC Dash 7, Dash 8
Bombardier Q-200/300
DC-3
Convair 580

C-I, D-I

Lear 25, 35, 55, 60
Israeli Westwind
HS 125-700

C-II, D-II

Gulfstream II/III/IV/G350
Canadair 600
Canadair Regional Jet
Lockheed JetStar

C-III, D-III

Bombardier Global 5000
Gulfstream 650
Boeing 737 Series /BBJ
MD-80, DC-9

Source: Century West Engineering

RUNWAY DESIGN CODE

The Runway Design Code (RDC) defines the design standards used for runway construction. The RDC is comprised of the two inputs related to (current/future) design aircraft, combined with approach visibility minimums for the runway:

- Aircraft Approach Category (AAC) – based on the approach speed of the aircraft;
- Airplane Design Group (ADG) – based on the wingspan and tail height of the aircraft; and
- The lowest approach visibility minimums established for the runway:
  - » Approach visibility minimums are determined by FAA for each runway based on the category of approach (visual, non-precision instrument, or precision instrument) and the most capable existing or future approach procedure.
  - » Lower visibility minimums generally correspond to instrument approaches that allow aircraft to descend to lower altitudes before requiring visual contact to be established with the runway environment prior to landing.
  - » RDC visibility minimums for each runway end are expressed in Runway Visual Range (RVR). Ground-based RVR transmitters project horizontal beams of light near the runway to measure forward visibility levels. The RVR values (measured in feet) correspond to visibility measurements commonly expressed in fractions of statute miles (e.g., 1-mile, 3/4-mile, etc.). The RVR for a runway reflects the most capable approach type or procedure for either runway end.

The existing RDC for Runway 17/35 is based on the current approach parameters (e.g., approach type and visibility minimums). As noted earlier, no change is anticipated in the aircraft-specific components of the RDC (AAC/ADG C-II). However, the approach visibility component may change within AAC/ADG C-II. Potential outcomes include maintaining or changing the existing approach visibility minimums. However, it is noted that changes to the visibility component of the RDC can trigger changes in dimensions for other airfield design standards, particularly runway protection zone (RPZ) dimensions.

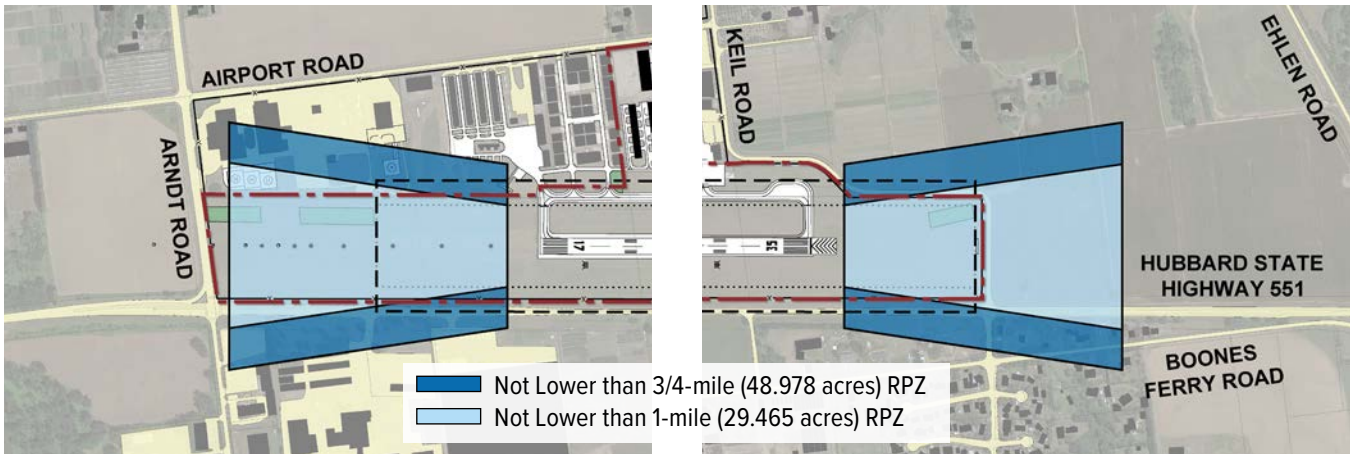
The **existing RDC for Runway 17/35 is C-II-4000** (lower than 1-mile, but not lower than 3/4-mile).

Potential RDC outcomes for both the existing and future runway lengths include:

1. Maintain existing RDC.
2. Change (downgrade) instrument approach visibility minimums to “not lower than 1-mile” **(RDC: C-II-5000)**.

A final recommendation for the future Runway 17/35 RDC will be based on the evaluation of airside (runway-taxiway system) alternatives conducted in Chapter 5 – Development Alternatives and in the RPZ Assessment. **Figure 4-2** illustrates existing RPZ dimensions related to the potential RDC options noted above.

FIGURE 4-2: RUNWAY DESIGN CODE/RUNWAY PROTECTION ZONE



Source: Century West Engineering

APPROACH AND DEPARTURE REFERENCE CODE

The Approach and Departure Reference Codes (APRC and DPRC) are not design standards, but rather an operational tool intended to aid Air Traffic Control (ATC) and airport staff to determine the capabilities of the airfield based on existing runway to parallel taxiway separation. Specifically, the APRC and DPRC identify the most demanding aircraft by Aircraft Approach Category (AAC), and Airplane Design Group (ADG) that may operate (approach or depart) on a runway in specific conditions without generating ATC operational controls.

The APRC is a three-component code that describes the most demanding aircraft by AAC and ADG that may operate concurrently with other aircraft on the airfield in certain visibility conditions without generating ATC operational controls. Since the APRC considers both AAC and ADG, it is possible for an airport to have two APRCs, where one represents the most demanding aircraft by AAC (paired with a lower ADG), and the other represents the most demanding aircraft by ADG (paired with a lower AAC).

The DPRC is similar to the APRC but is a two-component code (AAC and ADG) and does not consider a visibility component. The DPRC describes the type of aircraft that can depart a runway while any other aircraft is on the parallel taxiway. Much like ARPC, a runway may have two DPRCs to account for both AAC and ADG.

Table L-1 in *FAA Advisory Circular (AC) 150/5300-13B* lists the APRC based on runway to parallel taxiway separation and visibility minimum. The separation distance at the Aurora State Airport is 300 feet and the visibility minimums are not lower than 3/4 mile. This combination identifies APRCs of B/III/4000 and D/II/4000.

Table L-2 in the same AC lists the DPRC based only on runway to parallel taxiway separation. Referencing the Aurora State Airport's 300-foot separation identifies DPRCs of B/III and D/II.

The APRCs and DPRCs identified above indicate that the following aircraft may land, or depart on the runway, and taxi on the parallel taxiway at Aurora without operational restrictions:

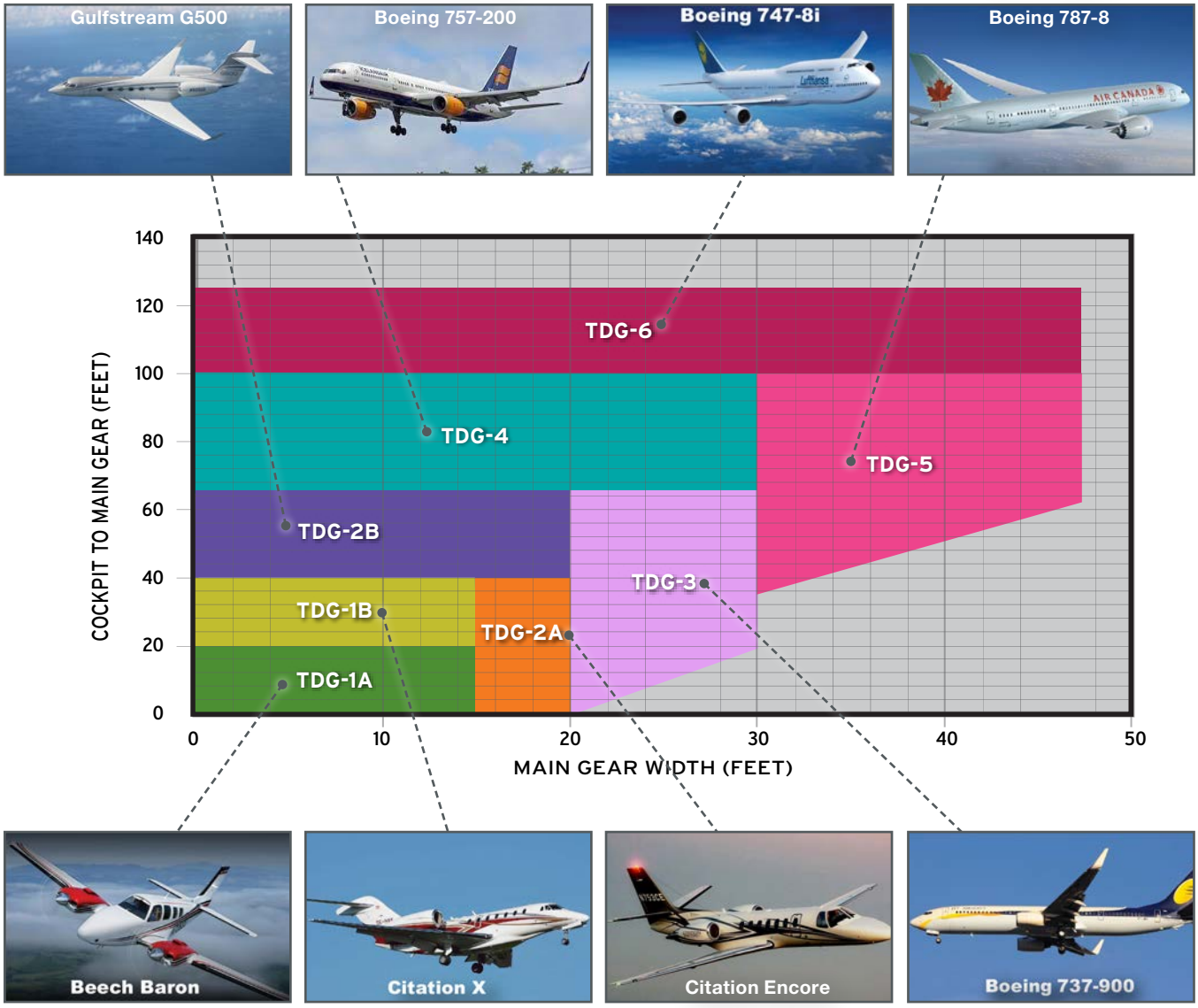
- Within Approach Categories A and B, Airplane Design Groups I(S), I, II, & III.
- Within Approach Categories C and D, Airplane Design Groups I and II.

TAXIWAY DESIGN GROUP

Taxiway design group (TDG), see **Figure 4-3**, is based on the physical dimensions of the aircraft landing gear, including distance from the cockpit to the main gear (CMG) and main gear width (MGW). These dimensions affect an aircraft's ability to safely maneuver on airport taxiways and dictate pavement fillet design. Although the TDG dimensional standards are presented for taxiways, they are also commonly used for taxilane design. Taxiways and taxilanes may be designed/constructed to different TDGs based on the expected use by specific types of aircraft. For example, the major taxiways at an airport should be designed for consistency with the design aircraft. Individual taxiways/taxilanes that are intended to accommodate only small aircraft would be designed based on the size of aircraft and the corresponding TDG.

The major taxiways at the Aurora State Airport are designed to accommodate ADG II aircraft, which are best represented by TDG-2A and -2B standards. **The use of TDG-2A and -2B standards accommodates the current and future Design Aircraft (CL60) and a diverse mix of other B/C/D-II aircraft that fall within the TDG-1B, -2A, and -2B criteria.** Taxilanes providing access to hangar areas and aprons will serve a variety of aircraft, primarily included in TDG-1A, -1B, -2A, and 2B. The TDG classification for these areas will be based on aircraft for which they are intended and determined in the alternatives evaluation process.

FIGURE 4-3: TAXIWAY DESIGN GROUPS



Source: Century West Engineering

FAA DESIGN STANDARDS

FAA AC 150/5300-13B Airport Design serves as the primary reference in establishing the geometry of airfield facilities. A comparison of existing condition dimensions and optional future design standards for the runway-taxiway system are summarized in **Table 4-1**. It is noted that all listed design standards are based on AAC/ADG C-II, which corresponds to the existing and future design aircraft. Optional standards based on different approach visibility minimums may affect specific design standards within AAC/ADG C-II.

FAA DESIGN STANDARDS

Specific design standards and conditions applicable to the Aurora State Airport facilities are presented in the following sections of this chapter within the sidebar "FAA Design Standards" text boxes. For additional information reference the appropriate sections within FAA AC 150/5300-13B.

TABLE 4-1: FAA DESIGN STANDARDS SUMMARY

		Existing Conditions/Standards		Optional Standards	
FAA Standard		Existing Dimensions	Existing Standard AAC/ADG C-II (not lower than 3/4 statute mile)	AAC/ADG C-II (Visual and not lower than 1 statute mile)	AAC/ADG C-II (Lower than 3/4 statute mile)
Runway Width		100'	100'	100'	100'
Runway Centerline to Parallel Taxiway Centerline Separation		300'	300'	300'	400'
RSA*	Width	500'	500'	500'	500'
	Length beyond runway end	1,000'	1,000'	1,000'	1,000'
	Length prior to threshold	600'	600'	600'	600'
OFA*	Width	685'*	800'	800'	800'
	Length beyond runway end	1,000'*	1,000'	1,000'	1,000'
OFZ	Width	400'	400'	400'	400'
	Length beyond runway end	200'	200'	200'	200'
Precision OFZ	Width	N/A	N/A	N/A	800'
	Length	N/A	N/A	N/A	200'
RPZ*	Inner Width	1,000'	1,000'	500'	1,000'
	Outer Width	1,510'	1,510'	1,010'	1,750'
	Length	1,700'	1,700'	1,700'	2,500'
	Acres	48.978	48.978	29.465	78.914
Runway Blast Pad**	Width	100' (RWY35)	120'	120'	120'
	Length	150' (RWY 35)	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		124'	124'	124'	124'

Source: FAA Advisory Circular 150/5300-13B and Century West Engineering documented existing conditions

*Existing Non-Standard Conditions Identified through the Facility Requirements evaluation:

- OFA: Hubbard Highway is partially located within Runway 17/35 OFA, approximately 373 feet west of runway centerline at its nearest point.
- OFA: Keil Road is partially located within Runway 17/35 OFA, approximately 312 feet east of runway centerline at its nearest point.
- RPZs: Existing RPZs extend beyond airport property and include surface roads or other built items.
- RSA: Drain field in RSA to be evaluated for conformance with FAA standards.
- RSA: Drainage ditch along Taxiway A is within the RSA, options for mitigation will be shown in CH 5 - Development Alternatives.
- RSA: The ASOS is within the RSA, options for relocation will be evaluated in CH 5 - Development Alternatives.
- RSA: The segmented circle and windcone are within the RSA, options for relocation will be evaluated in CH 5 - Development Alternatives.

**Blast Pad: There is no blast pad on Runway 17 end. Blast pads are not required, but are generally recommended for runways with jet traffic

Demand/Capacity Analysis

Annual service volume (ASV) is a measure of estimated airport capacity and delay used for long-range planning. ASV, as defined in *FAA AC 150/5060-5, Airport Capacity and Delay*, provides a reasonable estimate of an airport's operational capacity.

For long-term planning purposes, the FAA estimates ASV capacity for a single runway with no air carrier traffic is approximately 230,000 operations. Hourly capacity is estimated to be 98 operations per hour during visual flight rules (VFR) conditions and 59 operations/hour during instrument flight rules (IFR) conditions.

- 2021 Capacity: 76,028 Annual Operations / 230,000 ASV = 33% (demand/capacity ratio)
- 2041 Capacity: 90,230 Annual Operations / 230,000 ASV = 39% (demand/capacity ratio)

Operations in 2021 accounted for 33% of the ASV. Figure 2-2 in *AC 150/5060-5* indicates average delay per aircraft with this ratio is approximately 0.1 to 0.2 minutes. This results in a total annual aircraft delay ranging between 7,603 to 15,206 minutes. Based on forecast operations, the 2041 operational activity will account for 39% of ASV. Average delay per aircraft will remain in the range between 0.1 to 0.3 minutes. This results in a total annual aircraft delay ranging between 9,023 to 27,069 minutes.

Based on the above analysis, the average delay per aircraft at the Aurora State Airport is expected to remain below one minute through the planning period and no capacity enhancements to reduce delay times are anticipated during the planning period.

Regional Setting Goals and Requirements

The proposed facility goals and requirements for the regional setting of the Aurora State Airport are developed to address the issues and opportunities that fit within the regional context of the Airport. The regional setting is focused on the impacts and relationships that the Airport may have within the social, economic, and environmental context of the region, counties, and associated municipalities. The regional setting elements considered include location and vicinity, socioeconomic factors, airport history, system role, airport operations, applicable planning studies, environmental data, local surface transportation, and land use/zoning. Understanding the national, state, and local role of the Aurora State Airport provides important context about the facility and its users.

The Aurora State Airport is located in proximity to multiple local jurisdictions, each of whom have a public interest in protecting public-use airports and adjacent lands consistent with Oregon state law. The Airport, which was constructed in 1943, is an established public-use transportation facility closely resembling urban type densities (impervious pavement surfaces and building footprint coverage) in a rural environment. The pressure of rapid change and growth on and near the Airport due to a quickly growing metropolitan area has made planning and improvement of aviation related facilities an important topic for airport users and businesses, neighbors, and municipalities within the region.

The following goals reflect ODAV's current and future management objectives for the Aurora State Airport, consistent with its role as an established public-use air transportation facility:

- FACILITY GOAL. Support efforts by aviation-related businesses and neighboring jurisdictions to ensure the continued economic benefits of the Airport, including job creation and support of the local and regional tax base.
- FACILITY GOAL. Maintain effective, ongoing public outreach to promote public awareness and perception of the Aurora State Airport.
- FACILITY GOAL. Work with federal (FAA), state, and private partners to support the funding of facility improvements to satisfy aviation demand.
- FACILITY GOAL. Maintain and improve facilities as necessary, consistent with the national, state, and local roles defined for the Airport and public demand.
- FACILITY GOAL. Continue to monitor aircraft operations and based aircraft counts to provide FAA justification for funding future facility improvements.

Land use, transportation, and environmental issues are inextricably linked together. Understanding and addressing these interrelated issues within the context of the Airport and its local and regional setting is a critical step to developing an implementable planning document. Several of these key issues are discussed in more detail below.

Many of the regional surface transportation issues raised throughout the planning process, including traffic congestion on nearby rural roads, state highways, and interstate highways, are relevant planning topics for the greater community to consider. The traffic congestion and related concerns discussed during PAC meetings equally affect airport users, airport businesses, and non-aviation-related neighbors. However, the typical regional surface transportation concerns identified during the planning process are outside of ODAV jurisdiction and outside of the scope of work for this federally-funded airport master plan.

These important surface transportation issues are the responsibility of Marion County, Clackamas County, representative metropolitan districts, and the Oregon Department of Transportation (ODOT). The regulation of adjacent off-airport aviation related private property falls under the sole jurisdiction of Marion County. Developments are subject to local transportation and planning requirements for which ODAV has no statutory control. Based on the jurisdictional requirements prescribed by Marion County, any planned development that occurs on ODAV property that has the potential to increase vehicle traffic demand is subject to project-specific traffic analysis and/or planning study as a condition of approval. These types of evaluations are typically performed at the project design and permitting stage associated with local development review and approval, and are outside the scope of an airport master plan.

- FACILITY REQUIREMENT. As required under applicable regulations, coordinate with state and local land use and transportation agencies to define any necessary surface transportation infrastructure improvements driven by proposed improvement projects on ODAV property.

The analysis of environmental factors for federally funded projects is defined by the Council on Environmental Quality (CEQ) and implemented in the National Environmental Policy Act (NEPA). The regulations require agencies like the FAA to integrate the NEPA process with other planning projects as early as possible. As part of this Airport Master Plan, an environmental screening (**Appendix 2**) was conducted during the existing conditions analysis to begin the process of incorporating potential environmental factors. The environmental screening analysis and airport master planning process is not intended to be part of the formal NEPA process. It is intended to serve as the basis for future projects' purpose and need in environmental evaluation and the alternatives that the FAA will carry forward into the NEPA process (*AC 150/5070-6B* - Appendix D).

During the airport master planning process, PAC members and public stakeholders expressed concerns about noise from helicopters operating on privately owned parcels adjacent to the Airport and fixed-wing traffic operating from ODAV property. PAC members and public stakeholders also shared concerns about air quality (sulfur and lead emissions from jet and piston aircraft), water quality/availability, groundwater runoff, and other factors that fit within the NEPA categories described in Chapter 2 – Existing Conditions Analysis. The environmental concerns raised by PAC members and public stakeholders are being documented and will be provided on the project webpage and included as part of **Appendix 11** in the airport master plan for future consideration by the FAA during the completion of any environmental assessment required by NEPA.

- FACILITY REQUIREMENT. As required under applicable regulations, coordinate with local, state, and federal agencies to conduct appropriate environmental study and permitting for future development projects that occur on ODAV property.

- FACILITY GOAL. Coordinate with users of the Aurora State Airport, Air Traffic Control Tower staff, and adjacent helicopter operators (Columbia Helicopters and HTS) in the continual improvement of the voluntary "Fly Friendly Program" for the Airport that identifies noise-sensitive areas and considers changes in common visual flight paths to mitigate noise exposure around the Airport. This effort should also be coordinated with the FAA Seattle Airports District Office (ADO), local land use jurisdictions, and airport neighbors.

All proposed airport improvements are subject to Marion County review based on applicable zoning requirements.

Per OAR 660-13-0030 (2)[1], "A city or county with planning authority for one or more airports, or areas within safety zones or compatibility zones described in this division, shall adopt comprehensive plan and land use regulations for airports consistent with the requirements of this division and ORS 836.600 through 836.630."

At the conclusion of the Airport Master Plan, Marion County, Clackamas County, City of Aurora, City of Barlow, and City of Wilsonville will all require a comprehensive plan update to remain compliant with state land use laws. Each of these jurisdictions are located within the boundaries of the Part 77 airspace defined for Runway 17/35 at the Airport. Marion County, which is the jurisdiction responsible for land use development on, and surrounding the Airport, has acknowledged this requirement in comprehensive plan Policy #2 of the "Air, Rail, Water, Energy and Pipeline Transportation Policies."[2]

- FACILITY REQUIREMENT. Support adoption of the airport master plan into local planning documents as required by OAR 660-13-0030, which implements ORS 836.600 through 836.630 and Statewide Planning Goal 12 (Transportation) by applicable jurisdictions.

- FACILITY REQUIREMENT. Support local updates or development of overlay zoning designations, as required in OAR 660- 013-0050 and OAR 660-013-0070, consistent with planned facility improvements upon selection of a preferred alternative:
  - Marion County – update overlay zones (Marion County Code, Chapter 16.21) for airspace protection;
  - Clackamas County – update overlay zones (Clackamas County Zoning and Development Ordinance (ZDO), Chapter 713) for airspace protection;
  - City of Wilsonville – develop overlay zone ordinance for airspace protection; and
  - City of Barlow – develop overlay zone ordinance for airspace protection.

1 A city or county with planning authority for one or more airports, or areas within safety zones or compatibility zones described in this division, shall adopt comprehensive plan and land use regulations for airports consistent with the requirements of this division and ORS 836.600 through 836.630. Local comprehensive plan and land use regulation requirements shall be coordinated with acknowledged transportation system plans for the city, county, and Metropolitan Planning Organization (MPO) required by OAR 660, division 12. Local comprehensive plan and land use regulation requirements shall be consistent with adopted elements of the state ASP and shall be coordinated with affected state and federal agencies, local governments, airport sponsors, and special districts. If a state ASP has not yet been adopted, the city or county shall coordinate the preparation of the local comprehensive plan and land use regulation requirements with ODA. Local comprehensive plan and land use regulation requirements shall encourage and support the continued operation and vitality of airports consistent with the requirements of ORS 836.600 through 836.630.

2 The County should review and take appropriate actions to adopt State master plans for public airports in Marion County.

The *2003 Oregon Airport Land Use Compatibility Guidebook (LUGB)* presents the means and requirements for local governments to comply with airport land-use requirements established in OAR 660-013. The document is primarily intended as a guide to assist community review of airport-related planning issues. Chapter 6 of the LUGB outlines techniques for establishing compatible land uses at and around airports. One of the techniques discussed is the creation of separate zoning districts for airports. Establishing an airport development zone "creates a more distinct area of influence for the airport; gives the airport better opportunity to expand for airport-related dependent and compatible uses; and avoids possible unintended uses that often accompany an overlay zone."[3]

As previously discussed in Chapter 2 – Existing Conditions Analysis, Marion County is the jurisdiction responsible for the zoning and land use approvals at the Airport. The existing zoning designation for the Airport is Public (P) as defined in Marion County Code 17.171. The intent of the P zone is "to provide regulations governing the development of lands appropriate for specific public and semipublic uses and to ensure their compatibility with adjacent uses." Airports are permitted in the P zone with a Conditional Use approval. According to the LUGB and general planning practice, the lack of an "airport specific" zone and the added Conditional Use requirement associated with the actual zone may unduly burden new development of aviation related facilities. Although development of airport-specific zoning represents "best practice" in land-use planning, it is important to note that Marion County consistently recognizes the suitability and appropriateness of aviation-related developments within the P zone applied to the Airport.

- FACILITY GOAL. Request Marion County to evaluate options for revising their zoning code to include airport-specific zoning for public use airports, to support a future rezone of the Airport. The proposed addition of airport-specific zoning more closely aligns with the guidance provided in the LUGB.
- FACILITY GOAL. Request Marion County to rezone the Airport to the applicable airport-specific zone, once adopted.

Airside Elements Goals and Requirements

The airside facilities goals and requirements section includes a discussion of the area airspace, instrument flight procedures, runways, taxiways/taxilanes, aprons/tiedowns/aircraft parking, and airside support facilities.

AREA AIRSPACE AND INSTRUMENT FLIGHT PROCEDURES

The Class D airspace surrounding the Aurora State Airport (see **Figure 2-12**, Chapter 2) is regulated by the FAA and is in effect during the hours when the Air Traffic Control Tower (ATCT) is in operation. See Chapter 2 - Existing Conditions Analysis for a description of local airspace categories and features.

Since the Class D controlled airspace for the Airport was created when the ATCT began operation in late 2015, aircraft flight paths have evolved with formal direction provided by air traffic controllers (e.g., traffic pattern entry/departure, traffic avoidance instructions, etc.). As noted previously, the control of aircraft in flight in Class D airspace is at the direction of the ATCT and is outside the regulatory authority of ODAV. The standard operating characteristics of fixed-wing aircraft and helicopters vary based on the capabilities and needs of the specific aircraft.

Aircraft flight paths and the associated noise exposure are important issues regulated by FAA. The noise evaluations that will be conducted in the Airport Master Plan are defined by the FAA-approved project scope of work and cannot be modified without FAA approval.

3 LUGB (Page 6-2)- Airport Development Zone - This type of zoning is applied to areas around an airport identified for airport related and dependent uses. It often replaces industrial, public facility or other designations currently given to the airport site and immediate vicinity. The Airport Development Zone is a base zoning district that identifies outright and conditionally permitted uses on airport property. The zone should include areas used or needed for airport operations, areas needed for anticipated facility growth, airport-related industry and commercial operations and airport-related industrial, commercial or recreational activities. According to OAR 660-013-0160, local governments must update their zoning and land use regulations to conform to this division at periodic review.

Airspace issues addressed in the planning process are defined by FAA and involve specific design components intended to protect aircraft in flight from hazards (built items, obstacles, or terrain). These include both **14 Code of Federal Regulations (CFR) Part 77** airspace surfaces established for specific landing areas (runways, etc.) and **FAA Terminal Instrument Procedures (TERPS)** surfaces that define the unobstructed airspace corridors required to permit aircraft to operate without visual reference to outside surroundings. These arrival and departure paths have both vertical and lateral clearance requirements to known obstacles such as terrain or other items. See descriptions of these airspace surfaces in Chapter 2 – Existing Conditions Analysis.

These airspace surfaces are defined by approach type (visual, non-precision instrument, precision instrument) and the minimum approach visibility required for the most capable instrument approach procedure (IAP). The design aircraft parameters represented in the AAC/ADG are also reflected in some airspace planning criteria.

The existing Part 77 surfaces for Runway 17/35 are defined by the most demanding approach criteria currently in place. This is currently the 7/8-mile approach visibility minimum requirement established by FAA for the published Runway 17 and 35 RNAV/GPS IAPs, and the requirement established by FAA Notice to Air Missions (NOTAM) for the Runway 17 Localizer IAP.

Prior to the planning process, published IAP minimum visibilities for existing IAPs were as low as 3/4-mile. This visibility threshold was the result of a change implemented by the FAA Flight Procedures Team that was not requested by ODAV or recommended in previous planning for the runway. Early in the airport master planning process, several airspace issues related to this change were identified. These centered primarily on the significantly larger object free surfaces surrounding the runway that would be required to comply with Part 77 obstacle clearance standards. The expanded airspace would impact both on- and off-airport structures, roads, and other built items that were impractical to address. Based on this technical assessment, ODAV requested that FAA Flight Procedures Team (responsible FAA office) raise the approach visibility minimums to 7/8-mile to align the procedures with airspace planning established for the runway. This request was approved by FAA and is currently reflected in published FAA flight procedures or NOTAM.

In addition to addressing potential obstacle clearance conflicts, the ODAV request to raise the approach visibility minimums was supported by analysis of local weather conditions. Ten years of historical visibility data recorded by the Automated Surface Observing System (ASOS) located on the airfield were analyzed to gauge the occurrence of visibility conditions (increments) below 1-mile. The analysis indicated that visibility conditions less than 1-mile account for 2.74% of total observations. However, visibility conditions between 3/4-mile and 1-mile account for 0.49% of total observations.

TABLE 4-2: AURORA STATE AIRPORT ASOS RECORDED VISIBILITY OBSERVATIONS

	Observations	%
Greater than or equal to 3-mile vis.	589,823	94.54%
Greater than or equal to 1-mile but less than 3-mile vis.	16,945	2.72%
Less than 1-mile vis.	17,111	2.74%
3/4-mile vis.	3060	0.49%
Less than 3/4-mile	14,051	2.25%
Total observations	623,879	100.00%

Source: Aurora State Airport ASOS, 10 years of recorded data

The data in **Table 4-2** demonstrate the small incremental benefit provided by an instrument approach with 3/4-mile visibility minimums at the Aurora State Airport, compared to the next higher increment, in terms of airport accessibility. Existing site characteristics make accommodating 3/4-mile or lower approach visibility minimums impractical.

RUNWAY

Facility goals and requirements for Runway 17/35 were evaluated relative to runway orientation, length, width, pavement strength, and FAA design standards.

RUNWAY ORIENTATION AND CROSSWIND COVERAGE

Runway orientation is a function of wind speed and direction combined with the ability of aircraft to operate under given conditions. FAA has defined the maximum allowable direct crosswind for ADG II aircraft as 13 knots. A direct crosswind is when the wind direction is 90 degrees offset from the direction of flight. Lower and higher crosswind components (10.5 and 16 knots) are defined for smaller and larger general aviation (GA) aircraft. Most aircraft can tolerate higher crosswind speeds when the intersecting angle is reduced.

TABLE 4-3: WIND ANALYSIS

		10.5 knots	13 knots	16 knots
Runway 17	IFR	79.85%	79.98%	80.03%
	VFR	70.80%	70.94%	71.01%
	All-Weather	72.45%	72.59%	72.65%
Runway 35	IFR	71.58%	71.60%	71.61%
	VFR	58.04%	58.16%	58.20%
	All-Weather	60.81%	60.92%	60.95%
Combined Runway 17/35	IFR	99.77%	99.92%	99.99%
	VFR	99.62%	99.89%	99.99%
	All-Weather	99.65%	99.89%	99.99%

Source: FAA ADIP

The FAA recommends that primary runways accommodate at least 95% of local crosswind conditions. When this level of coverage is not provided, the FAA recommends consideration of a crosswind runway. An updated analysis of 10 years of onsite wind conditions was conducted to assess wind coverage provided by Runway 17/35. The ASOS-collected wind data indicates that Runway 17/35 accommodates more than 99% of all-weather wind conditions for large and small GA aircraft. Due to prevailing winds, Runway 17 is most often the preferred runway. The results of the analysis are summarized in **Table 4-3**.

→ FACILITY REQUIREMENT. It is recommended that the current runway alignment be maintained throughout the planning period.

RUNWAY LENGTH

The planning methodology used to define a runway length capable of satisfying existing and future demand at the Aurora State Airport is established by the FAA: *AC 150-5325-4B, Runway Length Requirements for Airport Design.* As noted in Chapter 2 – Existing Conditions Analysis, the current length of Runway 17/35 is 5,003 feet.

Demonstrating that defined runway lengths are justified is directly related to the FAA-approved forecast of aviation demand coupled with a detailed evaluation of aircraft operations, including aircraft that may be constrained by the current runway length. A constrained operation typically means that an aircraft operator must reduce payload/useful load (passengers, fuel, etc.) based on the runway length available. This is most common in warmer months when higher temperatures increase aircraft takeoff and landing distances, but it can also occur at moderate temperatures for some aircraft.

Using FAA planning methodologies, the evaluation of runway length requirements begins with the operational requirements of the design aircraft, or family of aircraft, expected to use the runway. Several airfield-specific conditions that affect aircraft performance are then verified including airport elevation, runway gradient, and the assumed operating temperature (average daily maximum temperature of the hottest month of the year). These inputs are applied to runway length curves presented in *AC 150-5325-4B* for the applicable segment of the GA aircraft fleet.

The FAA recommends a planning evaluation based on the “family of aircraft” approach for runways used by large airplanes (maximum takeoff weights between 12,500 pounds and 60,000 pounds) to capture the most common aircraft within a particular category. This grouping of aircraft is further characterized by determining the “useful load factor” at which they operate, based on the haul lengths and service needs of those aircraft.

This methodology is consistent with FAA planning criteria that correlates the needs of the existing and future design aircraft to approval of the Airport Layout Plan drawing and project eligibility for FAA funding. The specific design criteria applied to a runway does not preclude use by larger aircraft. Use by heavier aircraft may also be permitted with approval by airport management.

Aircraft Performance Curves (Runway Length Requirements)

For GA runways that accommodate large airplanes, the FAA recommends use of performance curves for runway length planning. The curves were developed by FAA based on approved airplane flight manuals, and they are intended to represent the needs of the fleet, rather than a single aircraft or type. This approach provides a more effective indication of the requirements of overall aircraft rather than relying on the requirements for an individual aircraft.

The design aircraft, or family of aircraft, defined in the FAA-approved Aviation Activity Forecasts, is matched to the applicable runway length curves that are defined based on the factors described below.

AC 150-5325-4B (Figure 3-2 and 3-3) provides two runway length curves for both the 75% and 100% segment of the fleet to reflect different useful loads for this category of aircraft. As noted earlier, useful load represents the payload (passengers, fuel, etc.) carried by the aircraft. The AC provides 60% and 90% useful load factors for both fleet percentages. For general reference, when an aircraft is at its maximum gross weight, it has reached its maximum useful load; however, that may not include full fuel tanks or a full passenger load depending on the aircraft's certificated design limits.

Percentage of Fleet

AC 150-5325-4B identifies *"Airplanes that Make Up 75 Percent of the Fleet" and "Remaining 25 Percent of Airplanes that Make Up 100 Percent of Fleet."* The AC provides guidance for selecting the appropriate grouping of aircraft fleet and the corresponding runway length curves that should be used for planning. The AC indicates that designers should use 75% of fleet curves when the aircraft under evaluation are not found in the 100% of fleet group. If a relatively few airplanes under evaluation are listed in the 100% of fleet aircraft group, then FAA recommends that the 100% fleet curves should be used.

Table 4-4 summarizes representative aircraft within these groups and identifies the listed aircraft currently using the Aurora State Airport.

TABLE 4-4: AC 150/5325-4A - 75% AND 100% OF FLEET AIRCRAFT

75% of Fleet	100% of Fleet
British Aerospace – Bae 125-700	British Aerospace – Bae Corporate 800, 1000
Beechcraft, Mitsubishi – Beech Jet - 400A, Premier I	Bombardier – Challenger 600, 601-3A/3ER, 604
Bombardier – Challenger 300	Cessna – S550 Citation S/II, 650 Citation III/IV, 750 Citation X
Cessna – Citation I, II, III, V, VII, CJ-2, Bravo, Excel, Encore, Sovereign	Dassault – Falcon 900C/900EX, 2000/2000EX
Dassault – Falcon 10, 20, 50	IAI – Astra 1125, Galaxy 1126
Israel Aircraft Industries – Jet Commander 1121, Westwind 1123/1124	Learjet – 45XR, 55/55B/55C, 60
Learjet – 20 series, 30 series, 40, 45	Raytheon Hawker – Horizon, 800/800 XP, 1000
Raytheon Hawker – Hawker 400, 600	Sabreliner – 65/75
Rockwell – Sabreliner 75A	

Source: FAA AC 150/5325-4B
Notes: 1. Red text indicates aircraft operating at the Aurora State Airport according to TFMSC data.

Table 4-5 summarizes 10 years of historical jet aircraft instrument flight plan filings for the Aurora State Airport. The filings provide a reliable indication of jet activity at the Airport, which has consistently included more than 500 annual operations for aircraft in the 100% of fleet grouping. Based on FAA criteria, use of the 100% of fleet runway length curves is appropriate for the Aurora State Airport.

TABLE 4-5: TFMSC IFR DATA - SELECT JET AIRCRAFT WITH MAXIMUM CERTIFICATED TAKEOFF WEIGHT OF MORE THAN 12,500 POUNDS

	Aircraft Designator	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Operations by Aircraft that make up 75% of the Fleet Group											
BAE HS 125	HS25	2	0	0	0	0	0	0	0	0	0
Beechjet 400/400A/400XP*	BE40	32	66	46	34	26	14	4	6	24	38
Beechjet Premier/Raytheon 390 Premier	PRM1	70	100	88	76	68	4	16	12	4	4
Bombardier Challenger 300	CL30	32	102	72	74	78	104	88	80	62	54
Bombardier Challenger 350	CL35	0	0	0	4	2	0	22	56	84	108
Cessna 500 Citation I	C500	0	4	8	0	20	20	2	0	0	0
Cessna 501 Citation I Special	C501	78	70	46	14	16	12	30	16	8	20
Cessna Citation CJ-2	C25A	44	68	178	82	74	188	234	154	100	184
Cessna Citation CJ-3	C25B	46	36	26	102	86	106	90	306	182	66
Cessna Citation CJ-4	C25C	6	12	2	4	10	72	60	636	678	790
Cessna 550 Citation II/Bravo	C550	212	134	164	226	262	158	212	174	138	162
Cessna 550 Citation Bravo	C55B	0	0	0	0	0	0	6	0	0	16
Cessna 551 Citation II/Special	C551	6	4	6	14	56	26	12	0	4	0
Cessna 560 Citation V Encore/Ultra	C560	366	498	466	590	694	774	708	632	546	626
Cessna 560 XL Citation Excel/XLS	C56X	106	118	132	260	318	400	438	396	340	286
Cessna 680 Citation - Latitude	C68A	0	0	0	0	0	4	10	30	30	40
Cessna 680 Citation Sovereign	C680	64	56	68	72	66	90	140	150	140	254
Cessna 700 Citation - Longitude	C700	0	0	0	0	0	0	0	0	0	18
Dassault Falcon 10	FA10	64	74	70	92	20	0	10	0	0	0
Dassault Falcon 20	FA20	94	86	28	14	98	74	76	68	66	82
Dassault Falcon 50/EX*	FA50	16	32	108	228	320	332	276	286	216	306
Embraer EMB545/Legacy 450	E545	0	0	0	0	2	2	0	0	4	2
Embraer ERJ 135/140/Legacy	E135	0	4	6	0	2	2	0	0	0	0
Embraer Legacy 500	E550	0	0	0	0	0	2	0	0	0	4
Embraer Phenom 300	E55P	14	106	98	96	88	130	56	80	256	434
Hawker 600	H25A	0	0	2	0	0	0	0	0	0	0
IAI Westwind 1124	WW24	10	8	4	2	10	2	2	4	0	0
Learjet 28	LJ28	0	0	0	2	0	0	0	0	0	0
Learjet 31	LJ31	4	2	0	0	6	54	92	110	32	22
Learjet 35	LJ35	2	8	18	0	4	6	8	4	0	12
Learjet 40	LJ40	10	0	8	0	4	0	2	0	2	6
Sabreliner 40/60	SBR1	2	4	0	2	2	0	0	0	2	0
Operations by Aircraft that make up 100% of the Fleet Group											
Bombardier Challenger 600/601/604	CL60	126	122	36	12	68	82	64	60	96	78
Cessna 650 Citation III/IV	C650	94	92	120	144	122	126	104	68	68	42
Cessna 750 Citation X	C750	60	76	92	94	102	100	108	92	84	38
Dassault Falcon 2000/EX	F2TH	2	14	6	4	6	4	40	134	124	366
Dassault Falcon 900C/EX	F900	180	148	48	10	56	82	70	110	32	24
Dassault Falcon F7X	FA7X	0	0	0	0	0	0	6	4	2	0
Gulfstream 150	G150	2	0	0	2	2	6	80	24	4	2
Gulfstream 280	G280	0	0	6	2	0	0	0	2	0	2
Hawker 700/800/800XP	H25B	224	212	316	118	42	28	34	22	8	32
Hawker Horizon	HA4T	2	2	2	0	0	0	0	2	2	6
IAI Astra 1125	ASTR	178	152	164	114	160	162	96	14	0	4
IAI Galaxy 1126	GALX	8	10	16	0	2	4	0	4	2	2
Learjet 45	LJ45	116	156	180	236	242	212	112	140	124	208
Learjet 55	LJ55	0	2	0	0	2	0	4	2	0	0
Learjet 60	LJ60	2	4	10	82	36	14	30	16	6	10
Operations by Aircraft with Maximum Takeoff Weight > 60,000 lbs											
Gulfstream II/G200	GLF2	2	0	0	0	0	0	0	0	0	0
Gulfstream III/G300	GLF3	0	0	2	2	2	0	0	0	0	2
Gulfstream IV/G400	GLF4	4	0	4	0	2	6	2	8	26	88
Gulfstream V/G500	GLF5	6	10	4	2	0	4	2	0	4	6
Gulfstream VI/G600	GLF6	0	0	0	0	6	4	2	0	0	0
Bombardier Global 5000	GL5T	0	0	0	0	0	0	0	2	0	0
Bombardier Global Express	GLEX	18	10	4	8	0	14	50	52	10	0
Total		2304	2602	2654	2818	3182	3424	3398	3956	3510	4444
Operations by 75% of the Fleet Group Aircraft		1280	1592	1644	1988	2332	2576	2594	3200	2918	3534
Operations by 100% of Fleet Group Aircraft**		1024	1010	1010	830	850	848	804	756	592	910

Source : FAA TFMSC Data; Notes: 1. **Total Operations by 100% of Fleet Group Aircraft includes Operations by Aircraft with Maximum Takeoff Weight > 60,000 lbs.

Aircraft Useful Load

Once the appropriate runway length curve set is identified based on percentage of aircraft fleet, an additional step is required to determine the appropriate useful load factor that applies to the aircraft operating at the Aurora State Airport. Useful load factors are based on the haul lengths and service needs of the design aircraft or a grouping of aircraft.

The FAA requires use of either 60% or 90% of useful load factors as described in Paragraph 303 of *AC 150-5325-4B*. Paragraph 303 explains that the *"75% of fleet at 60% useful load curve provides a runway length sufficient to satisfy the operational requirements of approximately 75% of the fleet at 60% useful load. This figure is to be used for those airplanes operating with no more than a 60% useful load factor."*

To justify a runway length based on the higher demand profile of 90% useful load curves, FAA requires documentation of 500 annual takeoffs and landings to/from airports beyond 1,000 nautical miles (NM) by aircraft in the 100% of fleet group. Traffic Flow Management System (TFMS) Flight plan data acquired from FAA through a Freedom of Information Act (FOIA) request was queried to identify operations by aircraft included in the 100% of fleet group originating at or departing from the Aurora State Airport. Operations between the identified city-pairs with distances of at least 1,000 NM were totaled. This exercise did not identify 500 annual operations by aircraft in the 100% of the fleet group traveling at least 1,000 miles. As a result, the 60% useful load curves should be used in determining runway length requirements.

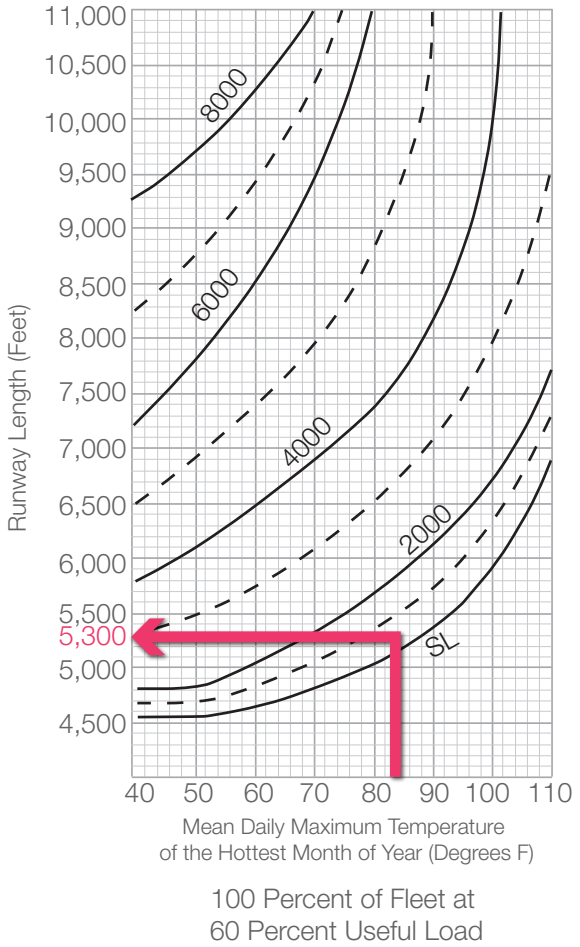
Runway Length Calculation

Figure 4-4 depicts the runway length curves for 100% of the fleet group with 60% useful loads identified in Figure 3-2 of *AC 150-5325-4B*. The Aurora State Airport is located at an elevation of 199.8 feet above mean sea level (MSL) and the mean maximum temperature (the average daily high temperature for the hottest month of the year) is 83°F.[4] Based on these inputs and the FAA runway length curves for 100% of fleet at 60% useful load, an unadjusted runway length of 5,300 feet is identified.

Further adjustment of the above length is required to account for effective runway gradient and wet and slippery conditions. It should be noted that these adjustments are not cumulative since the first adjusts for takeoffs and the latter adjusts for landings. After both adjustments have been independently applied, the larger resulting runway length is the standard methodology's recommended length.

Runway gradient is addressed by increasing the unadjusted runway length at a rate of 10 feet for each 1-foot of difference between runway high and low points. The runway has an elevation difference of 3.3 feet resulting in an adjusted runway length of 5,333 feet. For the 60% useful load fleet group, adjustments for wet and slippery conditions can increase the runway length either by 15% or up to a maximum of 5,500 feet, whichever is less. Applying a 15% adjustment to the runway length calculated above exceeds 5,500 feet. So, the recommended length is increased to 5,500 feet to satisfy the requirements for the wet/slippery conditions.

FIGURE 4-4: 100% OF FLEET AT 60% USEFUL LOAD CURVES



Source: FAA Advisory Circular 150/5325-4B

4 NOAA National Centers for Environmental Information, https://www.ncei.noaa.gov/access/us-climate-normals/

Based on local conditions, the standard methodology outlined above and in *AC 150-5325-4B*, and in coordination with FAA-SEA ADO, a runway length of 5,500 feet is identified to accommodate 100% of large airplanes (60,000 pounds or less maximum gross takeoff weight) at 60% useful load for the current 20-year planning period.

- FACILITY REQUIREMENT. Consistent with FAA planning methodologies a runway length of 5,500 feet at the Aurora State Airport defines the justified runway length for the planning and analyses to be performed in Chapter 5 – Development Alternatives.

RUNWAY WIDTH

Runway 17/35 is 100 feet wide with 10-foot-wide paved and gravel shoulders. The existing runway configuration meets the current and future FAA design standards defined for AAC/ADG C-II. Runway 35 has a paved blast pad (100 feet wide by 150 feet long). The Runway 17 end does not have a blast pad.

- FACILITY GOAL. The runway width and shoulders should be maintained at the existing width of 100 feet (with 10-foot shoulders). The blast pad adjacent to Runway 35 should be widened and adding a blast pad at the Runway 17 end is recommended based on current jet aircraft activity and common runway utilization.

FAA DESIGN STANDARDS

Runway Blast Pads

Existing/Future Standards: The AAC/ADG C-II standard for a blast pad is 120 feet wide and 150 feet long.

Condition: Runway 35 has a blast pad that is 100 feet wide and 150 feet long. Runway 17 does not have a blast pad. Blast pads are not a requirement for C-II runways. The Runway 35 blast pad may be widened to meet standards, and a new blast pad may be considered for Runway 17. Any blast pad improvements will not be eligible for FAA funding.

RUNWAY PAVEMENT STRENGTH

The existing published weight bearing capacity for Runway 17/35 is 30,000 pounds for aircraft equipped with single wheel gear (SWG) and 45,000 pounds for dual wheel gear (DWG) aircraft. Runway pavement strength and weight rating has become an important issue due an increase in aircraft landing requests submitted to airport management for aircraft over 60,000 pounds. The existing and future design aircraft is categorized as AAC/ADG C-II. A review of the FAA Aircraft Characteristics Database (2023), identified a range of maximum takeoff weight (MTOW) for AAC/ADG C-II between 21,500 pounds and 75,000 pounds for the 26 aircraft listed, including the Challenger 600 (CL60) which has a MTOW of 36,200 pounds. All of the listed aircraft are equipped with dual wheel landing gear.

The current runway pavement section was constructed in 2005 and is reaching the end of its 20-year design life. Operations by aircraft that exceed the runway's published weight bearing capacity may be expected to cause premature pavement stress and reduce the remaining lifespan of the runway pavement. As indicated in earlier documentation of air traffic, operations by aircraft with 12,500- to 60,000-pound operating weights at the Aurora State Airport are significant in volume and growing (see **Table 4-5**). The Airport also has on occasion accommodated limited operations by aircraft greater than 60,000 pounds.

The forecast increase in demand by aircraft weighing 45,000 to 60,000 pounds may warrant strengthening the runway pavement section as part of the next runway reconstruction project. This would prolong the service life of the runway and would provide additional durability for the limited amount of activity that exceeds 60,000 pounds. There is minimal demand for SWG aircraft above 30,000 pounds. Additional fleet mix analysis will be required by FAA to justify a change in pavement section design. This work is outside the airport master plan scope of work and would be performed in a pre-design element of project formulation.

- FACILITY REQUIREMENT. Maintain current weight bearing capacity, and perform additional engineering and fleet mix analyses to determine the appropriate runway pavement strength consistent with future pavement rehabilitation needs.

RUNWAY DESIGN STANDARDS

Runway 17/35 meets applicable FAA dimensional and clearance standards with two exceptions:

Runway Protection Zones (RPZ) – Portions of the existing RPZs extend off airport property and contain public roads. These issues are related to FAA land use compatibility guidelines.

Runway Object Free Area (OFA) – Portions of the existing OFA extend off airport property and contain public roads. Vehicles traveling on the roads penetrate the OFA. One helicopter parking position located south of the ATCT is located within OFA.

These items are discussed further in this chapter and in evaluations (RPZ Analysis and OFA Modification of Standards [MOS] Analysis) that will be completed as supporting elements for the Airport Master Plan's airside alternatives analyses.

A review of the applicable design standards is provided in the following section. Definitions of design standards and brief summaries of existing conditions are provided in the adjacent sidebars. As noted in **Table 4-1**, presented earlier in the chapter, the current AAC/ADG C-II design standards applied to the runway-taxiway system are consistent with runway approach visibility minimums "not lower than 3/4-mile." This standard corresponds to current instrument approach visibility minimums of 7/8-mile since the next incremental visibility threshold available is "not lower than 1-mile."

Runway Protection Zone

FAA *AC 150/5190-4B* provides guidance regarding RPZs and incompatible land uses. The AC directs airport sponsors to evaluate any planned changes to RPZs that will introduce or increase the occurrence of incompatible land uses within the RPZ.[5] FAA *AC 150/5300-13B* (Appendix I, Section 3) also provides current FAA guidance on permissible land uses within the limits of RPZs.

FAA guidance recommends the evaluation of existing roads in RPZs during airport master planning to determine if feasible alternatives exist for realignment of a road outside RPZs or for changes to the RPZs themselves. The FAA Seattle ADO has indicated that the primary focus of their review under this guidance is related to proposed changes to RPZs, which may include change to a runway end/RPZ location, approach visibility minimums, or the built items located in an RPZ. Any proposed changes in the length or threshold configuration of a runway that changes the location of existing RPZs are subject to review by FAA headquarters in Washington D.C.

FAA DESIGN STANDARDS

RPZ

Existing Standard: AAC/ADG C-II/not lower than 3/4-mile RPZs (48.978 acres). RPZs should be owned by the Airport or under control by easement and should be clear of incompatible land uses such as roads and buildings.

Future Standard (Options): Maintain existing standard or apply AAC/ADG C-II/not lower than 1-mile RPZs (29.465 acres) if instrument approach visibility minimums are changed from 7/8-mile to 1-mile.

Condition: Both Runway 17 and 35 RPZs have areas that are outside of ODAV-owned land and contain multiple incompatible land uses. As part of this Airport Master Plan, an analysis of the existing and proposed RPZs will be evaluated as part of the development alternatives analysis to identify an agreeable solution to address the incompatibilities.

The FAA also encourages airport sponsors to control RPZs through fee simple ownership. In cases where ownership is not in place, easements are used to control activities within the RPZ. Both RPZs for Runway 17/35 have small areas that extend beyond ODAV-owned property. ODAV has secured Avigation (FAA term: Air + Navigation) easements for these sections of the existing RPZs.

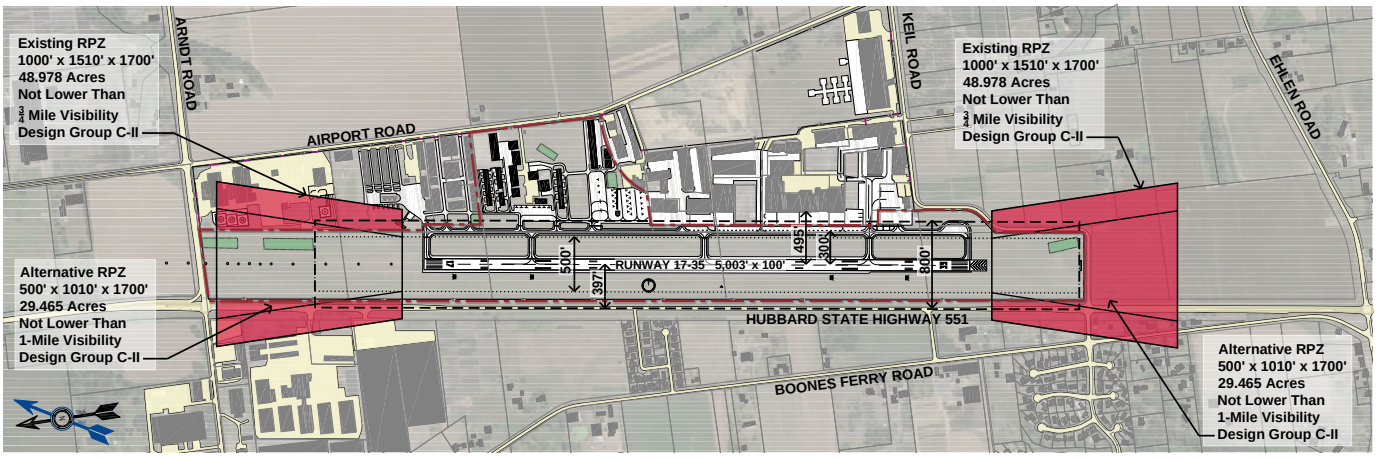
5 FAA September 16, 2022, Advisory Circular 150/5190-4B, Airport Land Use Compatibility Planning

The existing AAC/ADG C-II RPZ dimensions for Runway 17/35 are determined by the lowest published IAP visibility minimums of 7/8-mile. The corresponding RPZ dimensional standard is incrementally defined by FAA for runway approach visibility minimums "not lower than 3/4-mile" since the next available visibility increment is "not lower than 1-mile," which is not compatible with approaches having 7/8-mile visibility minimums.

For the purposes of this evaluation both the existing and an optional RPZ are displayed in **Figure 4-5**. The optional RPZ corresponds to dimensional standards defined for "approach visibility minimums not lower than 1-mile." As depicted in the figure, sections of both the existing (not lower than 3/4-mile) and optional (1-mile) RPZs for Runways 17 and 35 have identified land use incompatibilities. The size of future RPZs in relation to approach visibility requirements and land use compatibility will be assessed further in Chapter 5 – Development Alternatives Analysis.

→ FACILITY REQUIREMENT. Based on the conformance issues identified, it is recommended that existing and future RPZ land use compatibility be evaluated further and coordinated with FAA through the alternatives analysis process.

FIGURE 4-5: RUNWAY 17/35 PROTECTIONS ZONES NON-STANDARD CONDITIONS



Source: Century West Engineering

Object Free Area (OFA)

The runway OFA is a flat surface that sits at the same elevation as the runway. The OFA should be clear of terrain and above ground objects except for those required for air navigation or aircraft ground maneuvering purposes. *FAA AC 150/5300-13B* defines both dimensional and obstruction clearance standards for runway OFAs.

The OFA for Runway 17/35 has been identified as a nonstandard condition due to fencing, public roads, privately owned helicopter landing pads and roads, windcone, ASOS, and other objects located outside of ODAV property control, as depicted in **Figure 4-6**. As part of this Airport Master Plan, an OFA MOS analysis will be completed as part of Chapter 5 – Development Alternatives Analysis.

FAA DESIGN STANDARDS

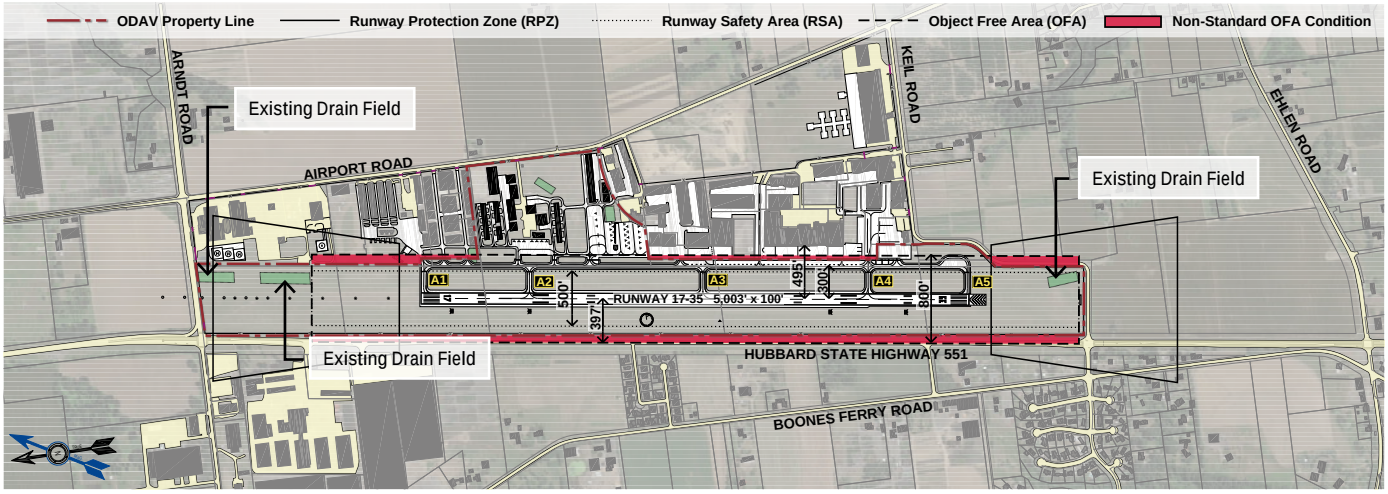
Runway OFA

Existing/Future Standards: AAC/ADG C-II/not lower than 3/4-mile standard is 800 feet wide (400 feet each side of runway centerline) and 1,000 feet beyond the runway ends. The OFA should be clear of above ground objects except for those required for air navigation or aircraft ground maneuvering purposes. Additional gradient standards apply.

Condition: The OFA for Runway 17/35 includes non-standard conditions such as fencing, public roads, and other objects off airport property that are located within the OFA. As part of this Airport Master Plan, an OFA MOS analysis will be completed as part of Chapter 5 – Development Alternatives Analysis.

→ FACILITY REQUIREMENT. Based on the facility needs identified in Chapter 4, it is recommended that the existing and future OFA be evaluated further and coordinated with FAA in the scoped OFA MOS Analysis as part of Chapter 5 – Development Alternatives Analysis.

FIGURE 4-6: RUNWAY OBJECT FREE AREA NON-STANDARD CONDITIONS



Source: Century West Engineering

Runway Safety Area (RSA)

The RSA is a flat surface that sits at the same elevation as the runway and is intended to be clear of terrain and above ground objects. The RSA is intended to enhance the safety of aircraft that overshoot, overrun, or veer off the runway, as well as to provide access for Aircraft Rescue and Firefighting (ARFF) equipment during such incidents. *FAA AC 150/5300-13B* defines dimensional, gradient, surface condition, and obstruction clearance standards for the RSA.

The RSA for Runway 17/35 meets AAC/ADG C-II design standards with the exception of the drain field located in the southeast corner of the RSA, the drainage ditch along Taxiway A, the ASOS, and windcone on the west side of the runway. The compatibility of non-standard items and potential mitigation strategies will be evaluated in Chapter 5 – Development Alternatives Analysis.

- FACILITY REQUIREMENT. AAC/ADG C-II RSA standards must be met and maintained for the existing runway and applied to any future runway configuration options evaluated in the development alternatives analysis.

Obstacle Free Zone (OFZ)

The AAC/ADG C-II standard width for the Runway 17/35 OFZ is 400 feet based on operations by large aircraft. The OFZ extends 200 feet beyond the runway ends. FAA definition, the runway OFZ clearing standard *"precludes aircraft and other object penetrations, except for frangible NAVAIDs that need to be located in the OFZ because of their function."*

FAA DESIGN STANDARDS

RSA

Existing Standard: AAC/ADG C-II/not lower than 3/4-mile standard is 500 feet wide (250 feet each side of runway centerline) and 1,000 feet beyond runway ends. The RSA should be cleared and graded with no objects higher than 3 inches above grade, except for FAA-approved items that are frangible (breakaway mounts). Additional gradient and surface compaction standards apply.

Condition: There are several items within the RSA for Runway 17/35 including the drain field, drainage ditch, ASOS, and windcone that will be studied further within the development alternatives. Future runway planning will require that the FAA standards are maintained.

Runway OFZ

Existing/Future Standards: Runway OFZ standards are based on approach visibility minimums of the runway, and the size and approach speeds of the aircraft using the runway. The standard for runways used by large aircraft are 400 feet wide or 200 feet each side of runway centerline and 200 feet beyond runway ends.

Inner-Approach OFZ

Existing/Future Standards: For runway ends with an approach lighting system (ALS), such as Runway 17, an inner-approach OFZ is required. By FAA standard, the inner-approach OFZ begins 200 feet from the runway end (at the same elevation) and extends 200 feet beyond the last light unit in the ALS. Its width is the same as the runway OFZ and rises at a slope of 50 (horizontal) to 1 (vertical) from its beginning.

Condition: Runway 17/35 meets the FAA dimensional and obstacle clearing standards for runway OFZ and the inner-approach OFZ (for Runway 17). Future runway planning will require that the FAA standards are maintained.

The OFA for Runway 17/35 and the inner-approach OFZ for Runway 17 meet AAC/ADG C-II design standards. In the event an ALS is proposed for Runway 35, the inner-approach OFZ standards would apply.

→ FACILITY REQUIREMENT. AAC/ADG C-II OFZ standards must be maintained for the existing runway and applied to any future runway configuration options evaluated in Chapter 5 – Development Alternatives Analysis.

Runway Markings

The markings on Runway 17/35, as noted in Chapter 2 – Existing Conditions Analysis, are consistent with FAA standards for color (white), configuration, and approach type, and are in good condition. The Runway 17 and 35 end identifiers (numbers) are based on the magnetic heading of each runway end. Runway end numbers are periodically updated based on the ongoing change in magnetic variation. The runway's alignment relative to magnetic north will be evaluated to determine if a change in runway designation will be required in the current planning period.

→ FACILITY REQUIREMENT. Runway markings should be maintained consistent with FAA standards. Periodic repainting should be incorporated into the ODAV Pavement Maintenance Program.

TAXIWAYS AND TAXILANES

The existing taxiway and taxilane systems on ODAV property were analyzed relative to the runway, apron, and aircraft parking requirements, hangars, and FAA design standards. Existing taxiway markings at the Airport are consistent with FAA standards for color (yellow) and configuration, and are generally in good condition.

The existing runway to parallel taxiway centerline separation for Taxiway A is 300 feet, which meets the current C-II standard.

It is noted that existing parallel taxiway separation would not meet the standard of 400 feet for C-II runways with lower than 3/4-mile visibility minimums. Due to other facility limitations associated with implementing "lower than 3/4-mile visibility minimums," it is unlikely that visibility minimums will be reduced.

Taxiway A, the run-up apron at the south end of the taxiway, and connector taxiways (A1-A5) generally meet standards with several notable exceptions, as depicted in **Figure 4-7**.

Two FAA-designated hot spots exist on the Aurora State Airport taxiway system. A hot spot is a location on an airport movement area with a history or potential risk of collision or runway incursion, and where heightened attention by pilots and drivers is necessary. The hot spots and other locations on the Taxiway A system that warrant further consideration are summarized below:

- Hot Spot #1 is located at Taxiway A and A1. Based on previous discussions with FAA, it is understood that this hot spot will be removed from the designation list if proper marking and signage is installed. Airport management reports that the appropriate pavement markings have been updated and the signage will be addressed in a future project. Further discussion with FAA will be required to remove the designation from the FAA Hot Spots List database.

- Hot Spot #2 is located at Taxiway A and A4. This location is identified as a "direct access" taxiway and solutions to address this non-standard condition will be considered during the development alternatives analysis.

FAA DESIGN STANDARDS

Runway to Parallel Taxiway Separation
Existing/Future Standards: AAC/ADG C-II/not lower than 3/4-mile standard is 300 feet.

Condition: The parallel taxiway (Taxiway A) for Runway 17/35 has a centerline-to-centerline separation of 300 feet.

Parallel Taxiway to Taxilane Separation
Existing/Future Standards: The separation standard between a parallel taxiway and an adjacent parallel taxilane is based on ADG. The ADG II standard is 101.5 feet.

Condition: The centerline-to-centerline separation between Taxiway A and the north side hangar taxilanes is 105 feet and exceeds standards. Future development of any parallel taxiway/taxilanes will meet the standards of the ADG/TDG for which they are designed.

Taxiway Width
Standards: TDG 2A/2B standard taxiway width is 35 feet.

Condition: Taxiway A and the five connector taxiways (A1-A5) meet the FAA dimensional standard (width). Future taxiways will be required to meet the ADG/TDG standards for the intended aircraft use.

Points of direct runway access from the adjacent properties are located at Taxiways A1, A3, and A4. Taxiways A3 and A4 are located along wide expanses of unbroken pavement fronting the east edge of Taxiway A. These direct access conditions and the wide expanse of pavement are not consistent with current FAA taxiway design guidance. Changes in pavement configuration will be evaluated in the airside alternatives analysis. Options may include increasing the distinction between apron and taxiway pavements, limiting the number of aircraft access points along this section of Taxiway A, and modifying the direct paths in the A1, A3 and A4 runway-taxiway-interface to improve pilot situational awareness and reduce the potential for inadvertent runway incursions.

The north end of runway/taxiway system does not currently have a designated aircraft runup area. A review of options will be performed in the airside alternatives analysis near Taxiways A1 and A2. Options may include concepts for both ODAV property and private property that were explored in a recent environmental assessment. It is noted that options that were previously considered, which included acquisition of private property were met with resistance from existing airport users and were ultimately excluded from the scope of work in the environmental assessment. A potential site located on ODAV property near Taxiway A2, adjacent to the old fuel pumps, has been identified as a possible location to be considered during the development alternatives process.

FAA DESIGN STANDARDS

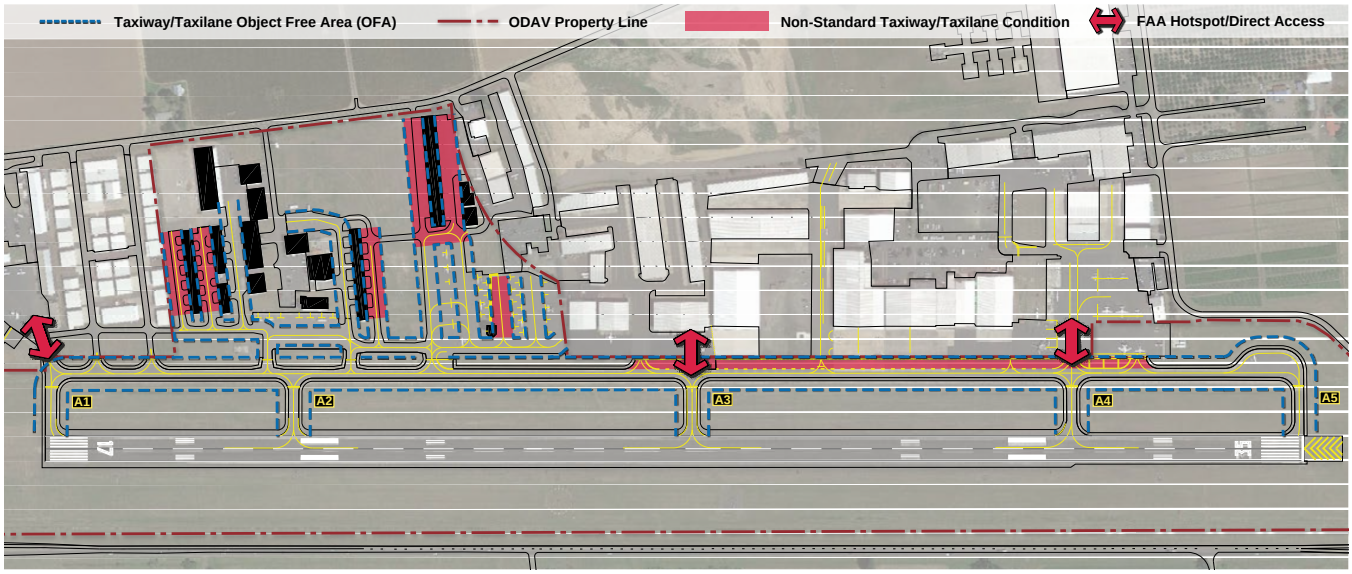
Taxiway Safety Area (TSA)
Standards: ADG II standard is 79 feet wide or 39.5 feet each side of the taxiway centerline for the entire length of the taxiway. Additional gradient standards apply.

Condition: The existing TSAs on the Airport meet FAA dimensional and grading standards. Future taxiway improvements will be required to meet the standards of the ADG for which they are designed.

Taxiway Object Free Area (TOFA)
Standards: ADG II standard is 124 feet wide or 62 feet each side of taxiway centerline.

Condition: The TOFA for Taxiway A and Taxiways A1-A5 satisfy FAA dimensional and obstacle clearing standards for ADG II. Future taxiway improvements will be required to meet the standards of the ADG for which they are designed.

FIGURE 4-7: TAXIWAY / TAXILANE NON-STANDARD CONDITIONS



Source: Century West Engineering

The taxilane object free area (TLOFA) standard for ADG II aircraft is 110 feet (55 feet each side of centerline). The ADG II standard is applied to much of the airfield on ODAV property. ADG I TLOFA standards—79 feet (39.5 feet each side of centerline)—are applied to several small aircraft areas. By FAA standard, the TLOFA should be free of items that could create a hazard for taxiing aircraft including parked aircraft, hangars, fences, other built items, and natural terrain. It is common for taxilanes serving aircraft parking aprons and hangar developments to be designed to meet the standards of a particular group of aircraft using the facilities.

The taxilanes in the apron area adjacent to the ATCT generally meet FAA TLOFA dimensional standards for ADG I and ADG II aircraft, where applicable. Future Improvement of taxilanes associated with apron and aircraft parking expansion will meet the standards of the ADG for which they are designed.

Several taxilanes located between hangar rows have non-standard TLOFA widths due to building separation and other obstructions like fencing on adjacent private property. The TLOFAs in these areas range from 69 to 79 feet. The areas where the TLOFA is narrower than required by standards are not typically considered to be deficient by airport users based on the aircraft using the facilities. *AC 150/5300-13B* provides guidance for calculating appropriate taxilane centerline to object separation distance based on the wingspan of the most demanding aircraft anticipated to use the taxilane.

The equations offered in the AC include:

- Taxiway centerline to object separation equals 0.7 times airplane wingspan plus 10 feet.
- Taxiway centerline to object separation equals 0.6 times airplane wingspan plus 10 feet.

Doubling the results of the above equations yields in a TLOFA width appropriate for that or smaller aircraft

For a typical single-engine fixed-wing aircraft or light-twin aircraft with a 41-foot wingspan, the FAA formula yields a recommended TLOFA of 69 feet wide. Options to provide standard TLOFA widths on ODAV-owned property will be considered in Chapter 5 – Development Alternatives Analysis. For long-term hangar redevelopment, the FAA may require standard TLOFAs, if physically feasible, as hangars are replaced at the end of their useful life.

- FACILITY REQUIREMENT. Coordinate completed mitigation on Hot Spot #1 with FAA to remove from the FAA's active list.
- FACILITY REQUIREMENT. Evaluate modifications to Hot Spot #2 to identify an acceptable solution/redesign for Taxiway A4 in Chapter 5 – Development Alternatives Analysis.
- FACILITY REQUIREMENT. Define measures required to correct the "direct access" taxilane at Taxiway A and A3 by identifying an acceptable solution/redesign in Chapter 5 – Development Alternatives Analysis.
- FACILITY REQUIREMENT. Evaluate north aircraft runup area options at the north end of Taxiway A in Chapter 5 – Development Alternatives Analysis.
- FACILITY REQUIREMENT. Evaluate TLOFA clearance options for taxilanes in Chapter 5 – Development Alternatives Analysis.
- FACILITY GOAL. Taxiway markings should be maintained consistent with FAA standards. Periodic repainting should be incorporated into the ODAV Pavement Maintenance program.

APRONS AND TIEDOWNS

Transient aircraft are typically stored on the Airport for short periods of time, typically less than a day. Based aircraft may be stored either in hangars or on apron tiedowns. However, national and local trends have shown it is the preference of aircraft owners to favor hangars when storing their aircraft at their base airport, rather than using outside parking on aprons. For the purposes of this study, it is assumed that based aircraft will be accommodated predominately by hangar storage and additional future demand for apron parking will be driven by transient aircraft. The anticipated demand for long-term tiedowns for based aircraft is expected to be small and can be incorporated into the transient demand.

Past planning studies have quantified transient tiedown demand using an FAA methodology that has since been removed from *AC 150/5300-13B*. An alternative method described in **Airport Cooperative Research Program (ACRP) Report 113** was used instead. The ACRP method applies the following formula to operations fleet mix forecast to estimate future demand for transient aircraft parking:

*(X/2 * T)/365 * P = Number of Transient Parking Positions*

Where:

X = number of operations

T = percent of operations that are transient (51% at the Aurora State Airport)

P = percent of transient aircraft that are parked on the apron at the same time (50% estimated)

The ACRP formula was applied to operations fleet mix forecast estimates in Table 3-18 in Chapter 3 to calculate the number of additional transient aircraft tiedown spaces needed over the 20-year planning period. Transient operations are not available in the adjusted ATCT counts. Instead, transient activity is derived from ATCT itinerant operations data. Itinerant operations account for 51% of the 2021 total operations. Transient activity is estimated to be 25% of itinerant, or 12.75% of total operations. The percentage of transient aircraft parked on the apron at one time (50%) is a planning level estimate used in lieu of quantifiable aircraft parking data. The estimated splits referenced above are assumed to remain consistent over the 20-year planning period. Previous planning studies identified a standard ratio of 360 square yards (3,250 square feet) of apron per tiedown intended for a single-engine piston aircraft, such as the Cessna 182, to account for taxilanes and required spacing between aircraft. This area is 3.1 times the footprint area of the Cessna 182. To scale up to other types of aircraft and calculate the apron space needed, the same multiplier was applied to the corresponding footprint areas of the representative aircraft for each aircraft type. The anticipated transient aircraft parking positions and required apron space are summarized in **Table 4-6**.

TABLE 4-6: TRANSIENT AIRCRAFT TIEDOWN AND APRON REQUIREMENTS

	Single Engine Piston	Multi Engine Piston	Turbo-prop	Jet	Helicopter	Total
Additional Transient Aircraft Parking						
2026	1	(1)	1	1	1	3
2031	1	(1)	1	1	1	3
2041	(1)	(1)	1	1	1	1
Total	**1**	**(3)**	**3**	**3**	**3**	**7**
Additional Apron Area (sq. ft)						
2026	3,250	(5,200)	7,400	9,200	4,100	18,750
2031	3,250	(5,200)	7,400	9,200	4,100	18,750
2041	(3,250)	(5,200)	7,400	9,200	4,100	12,250
Total	**3,250**	**(15,600)**	**22,200**	**27,600**	**12,300**	**49,750**

Source: Century West Engineering

It should be noted that the operations fleet mix forecast projects a decrease in operations by multi-engine piston aircraft. This results in a decrease of three parking positions required to accommodate these aircraft. As this transition occurs, these tiedown locations should be repurposed to accommodate demand by other aircraft.

- FACILITY REQUIREMENT. An additional 49,750 square feet of apron is needed during the current planning period to accommodate projected demand. The need for an additional seven aircraft parking positions is defined over the course of the planning period.

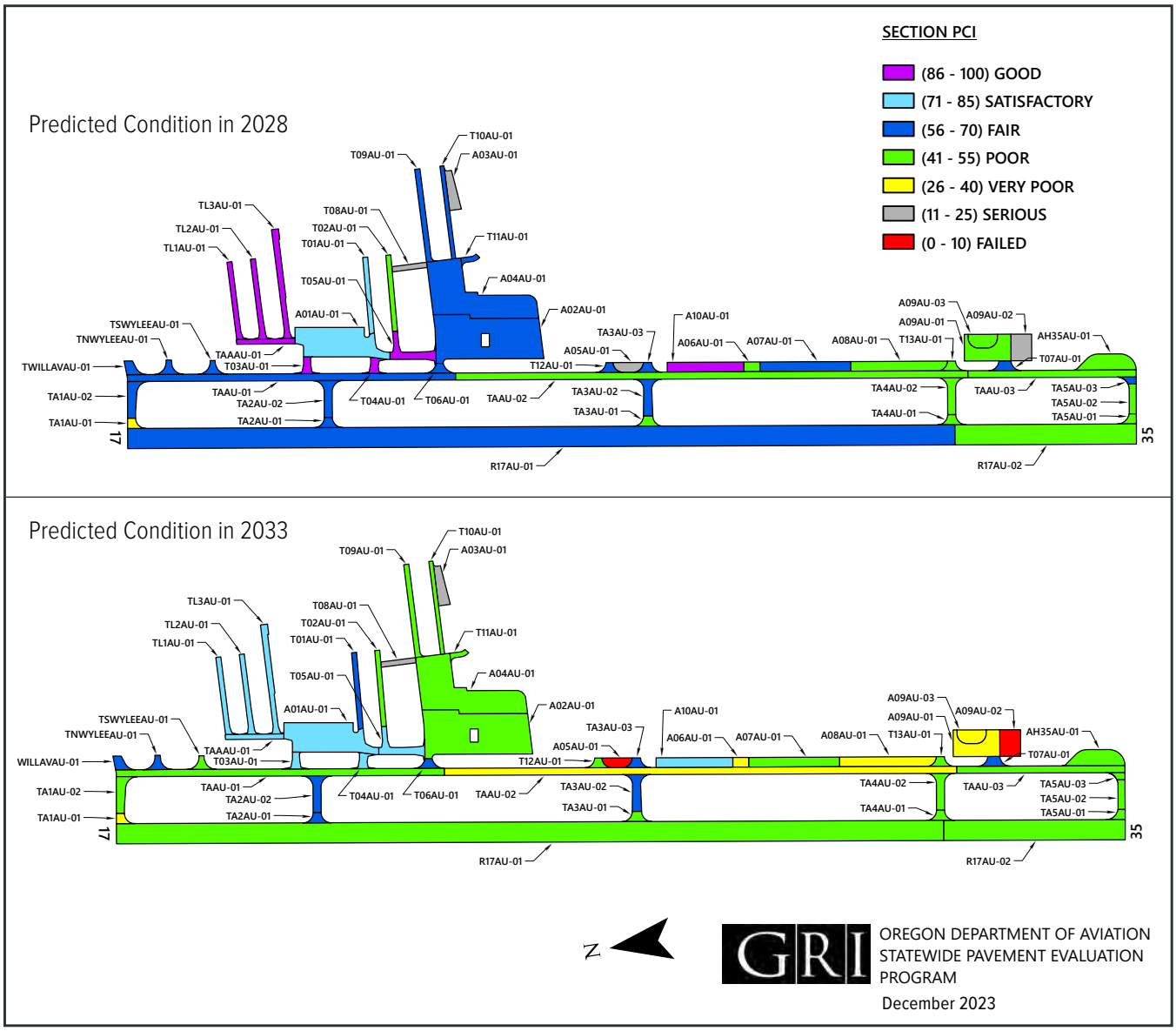
AIRFIELD PAVEMENT CONDITIONS

An updated Pavement Evaluation/Maintenance Management Program inspection (PEP), performed by ODAV contractors, was conducted in 2023 for all airfield pavements. A summary of pavement conditions provided in the 2023 pavement condition report states:

- Section Pavement Condition Index (PCI) at the Aurora State Airport range from a low of 18 (a PCI of "Serious") to a high of 94 (a PCI of "Good"). The area-weighted average PCI for all airport pavements is 62, corresponding to an overall PCI of "Fair."

A graphical depiction of predicted 2028 and 2033 (assuming no future pavement maintenance) is presented below in **Figure 4-8**. The area weighted average condition for existing airfield pavements is predicted to be "Fair" in 2028, and projected to be "Poor" in 2033 according to the PEP. Additional pavement analysis for Runway 17/35 completed by ODAV in 2023 confirmed that rehabilitation will be required in the current planning period as the runway reaches the end of its 20-year design life. Continued use by heavier aircraft is expected to accelerate pavement wear and may impact the timetable for rehabilitation. ODAV is currently considering a range of pavement management options to avoid premature pavement failure that would require costly emergency repairs or an extended unplanned closure of the runway.

FIGURE 4-8: PREDICTED PAVEMENT CONDITIONS



Source: Oregon Department of Aviation – 2023 Pavement Evaluation/Maintenance Management Program

- FACILITY REQUIREMENT. Perform ongoing airfield pavement maintenance in accordance with ODAV PEP recommendations to maximize the longevity of the airfield pavements during the current planning period and beyond.
- FACILITY REQUIREMENT. Rehabilitation of Runway 17/35 is anticipated in the near-term (0-5 years), based on its current condition, age, and use.
- FACILITY REQUIREMENT. Rehabilitation of the southern two-thirds of the existing Taxiway A pavement is anticipated during the 10- to 20-year phase of the planning period.
- FACILITY REQUIREMENT. Rehabilitation of the main apron pavement is anticipated during the 10- to 20-year phase of the planning period.

AIRPORT SUPPORT SERVICES

Airport support services and facilities includes the typical airside supporting facilities such as airfield lighting, signage, weather reporting equipment, ground-based navigational aids (NAVAIDS), and fueling facilities.

Runway/Taxiway/Apron Lighting

The Runway 17/35 and taxiway lighting system consists of standard Medium Intensity Runway Lighting (MIRL) and Medium Intensity Taxiway Lighting (MITL). The apron edges and some taxilanes are marked with blue edge reflectors. The lighting system is in good condition. Typical airfield lighting systems have a useful life of 20 years, though some systems may operate beyond the estimated useful life. For planning purposes, replacement of all airfield lighting systems will be assumed during the current planning period of 20 years.

Current generation airfield lighting is moving exclusively toward light-emitting diode (LED) systems. FAA design guidance for airfield lighting is to provide consistency between incandescent or LED systems. As a result, upgrading any individual airfield lighting to system to LED will prioritize airfield-wide LED upgrades as funding is available. A similar issue may exist for any future runway or taxiway extensions where combining existing incandescent systems and new LED systems may not be compatible with FAA guidance.

- FACILITY REQUIREMENT. The existing MIRL system can be maintained through the end of its useful life. Replacement of the existing MIRL system with LED units is anticipated during the current planning period. Depending on overall project requirements and funding levels, MIRL replacement may also be considered as part of the anticipated runway pavement rehabilitation project to minimize operational downtime for the runway. The MIRL system should be updated as necessary to address any changes to the runway identified in the development alternatives analysis process.
- FACILITY REQUIREMENT. The existing MITL system can be maintained through the end of its useful life. Replacement of the existing MITL with LED units is anticipated during the current planning period. The MITL system should be updated as necessary to address any changes to the taxiway system identified in the development alternatives analysis process.
- FACILITY REQUIREMENT. Apron and taxilane edge reflectors should be maintained and periodically replaced as needed. Additional edge reflectors should be installed as necessary for new construction or reconfiguration identified in the development alternatives analysis process.

Airfield Signage

The runway-taxiway system has extensive internally illuminated lighted signage that conveys directional, location, and runway clearance information to pilots. Upon a recent site survey, all lighted signs appeared to be in good working condition.

- FACILITY REQUIREMENT. Existing airfield signage can be maintained through the end of its useful life. Replacement of existing signs with LED units is anticipated during the current planning period.

  ODAV has been working with the FAA Runway Safety Action Team (RSAT) to increase opportunities for safety on the airfield, including the installation of additional lighted signage.

Weather Reporting

The Aurora State Airport has an automated weather observing system (ASOS) owned and operated by the FAA that provides 24-hour weather information. The ASOS is located on west side of the Airport between Runway 17/35 and the Hubbard Highway. The ASOS is in good working condition, but will likely require replacement during the current planning period.

- FACILITY REQUIREMENT. It is recommended that ODAV continue coordinating maintenance of the ASOS with the National Weather Service (NWS). A Letter of Agreement (LOA) with NWS, FAA Tech Operations, and the ATCT provides for access to maintain the equipment. Continue to protect the defined ASOS critical area from encroachment to ensure reliable site readings.

NAVAIDS

NAVAIDS at the Aurora State Airport include both visual NAVAIDS and electronic NAVAIDS. Visual NAVAIDS include FAA-owned Visual Approach Slope Indicators (VASI) on both runway ends, the Omnidirectional Approach Lighting System (ODALS) on Runway 17, and the airport rotating beacon. All NAVAIDS on the field are reported to be in functional operating condition.

Several electronic NAVAIDS maintained by the FAA, both on site in the vicinity, serve operations at the Aurora State Airport. These include the Runway 17 Localizer (LOC) with Distance Measuring Equipment (DME) and the Newberg (URG) Very High Frequency Omnidirectional Range with DME (VOR/DME).

- FACILITY REQUIREMENT. The airport rotating beacon can be maintained through the end of its useful life. Replacement with an LED unit is anticipated during the current planning period. In the event of changes to the airfield, the rotating beacon may be relocated or reconfigured as necessary. Tree growth in the immediate vicinity of the rotating beacon should be controlled to maintain beacon visibility from the air in all directions.
- FACILITY REQUIREMENT. The Runway 17 ODALS can be maintained through the end of its useful life or upgraded based on current approach lighting system technologies. Replacement with an LED unit is anticipated during the current planning period. New FAA-funded ODALS installations are uncommon. Options for installation of a new generation approach lighting system may be addressed in the airside development alternatives analysis process, in addition to any system changes that may be related to changes in the runway.
- FACILITY REQUIREMENT. The VASI units can be maintained through the end of their useful life. Replacement with an LED Precision Approach Path Indicator (PAPI) system is anticipated during the current planning period, or in the event of changes to the runway.

Fixed-Base Operations/Flight Training Services/Fuel Services

Fixed-base operations (FBO), flight training, and fuel services are provided by several commercial operators. Some are located on private property with TTF access and others are located on ODAV property with leases.

Landside Elements Goals and Requirements

The landside facilities goals and requirements section includes a discussion of the GA terminal areas, hangars and airport buildings, airport surface roads and vehicle access, vehicle parking, airport fencing, and utilities. The focus of the Airport Master Plan is on the facilities located on ODAV owned property.

GENERAL AVIATION TERMINAL AREAS

There is approximately 8 acres of land in the ODAV terminal area that are available for future hangars, aircraft storage, and other aviation related needs.

HANGARS/AIRPORT BUILDINGS

As previously discussed, hangars are generally preferred for storage of aircraft based at the Airport, while tiedowns are predominately used by transient aircraft. For this study, most demand for storage of aircraft based at the Aurora State Airport will be met through hangars.

The Aurora State Airport has a variety of hangar types. These hangars are privately managed and include T-hangars, conventional box hangars, and commercial hangars. Currently an estimated 971,100 square feet of hangar space is available to airport users. The occupancy status of all the privately owned and managed hangars is not available, but it is estimated that the existing hangars are operating at or near capacity.

Table 4-7 summarizes the criteria used to estimate hangar space demand over the planning period. The typical physical requirements for the different types of based aircraft type included in the aviation activity forecasts are used to approximate an appropriate hangar area for each type. The footprint of the representative aircraft is the product of the aircraft's wingspan (or rotor diameter) and length. A low, high, and average hangar area for each aircraft type is provided. The low hangar areas listed for single-engine, multi-engine, and turboprop are representative of the space provided by a T-hangar for each aircraft type. The high hangar areas listed are representative of the space provided by a conventional box hangar and includes additional space around the aircraft to further protect against damage. For this study, the average of the two were used to calculate storage space needed.

TABLE 4-7: HANGAR AREA CRITERIA

	Single Engine Piston	Multi Engine Piston	Turbo-prop	Jet	Helicopter
Example Aircraft	Cessna 182	Cessna 340	King Air 200	Cessna Citation III	Bell 206
Footprint (Wingspan x Length, sq. ft.)	1,044	1,651	2,384	2,969	1,322
Low Hangar Area per Aircraft (sq. ft.)	1,100	1,700	2,500	3,500	1,500
High Hangar Area per Aircraft (sq. ft.)	2,000	3,500	4,000	5,000	3,000
Average Hangar Area per Aircraft (sq. ft.)	1,550	2,600	3,250	4,250	2,250

Source: FAA Aircraft Characteristics Database, Century West Engineering

The above areas were applied to the five-year forecast increments by aircraft type from the based aircraft fleet mix forecast presented in Chapter 3. The FAA-approved aviation activity forecasts suggest a decline in single-engine piston, multi-engine piston, and turboprop aircraft over the 20-year planning period. As presented in **Table 4-8**, the resulting facility requirements analysis indicates decreased demand for T-hangars and smaller box hangars that house individual aircraft and an increase in demand for larger corporate style hangars that accommodate ADG I and II jet aircraft and multiple single-engine aircraft in a single building.

TABLE 4-8: HANGAR AREA REQUIREMENTS

	Single Engine	Multi Engine	Jet	Helicopter	Total
Additional Aircraft					
2026	(21)	(4)	2	2	(21)
2031	(20)	(3)	3	2	(18)
2041	(33)	(4)	5	5	(27)
Total	**(74)**	**(11)**	**10**	**9**	**(66)**
Additional Hangar Area (sq. ft.)					
2026	(32,550)	(10,400)	8,500	4,500	(29,950)
2031	(31,000)	(7,800)	12,750	4,500	(21,550)
2041	(51,150)	(10,400)	21,250	11,250	(29,050)
Total	**(114,700)**	**(28,600)**	**42,500**	**20,250**	**(80,550)**

Source: Century West Engineering

- FACILITY REQUIREMENT. The remaining undeveloped areas in the ODAV Terminal Development Area and any future infill development opportunities should be reserved to accommodate aeronautical uses.

AIRPORT SURFACE ROADS

The Airport's blue and purple gates provide landside access to ODAV property from the public right-of-way. There are limited internal vehicle roads and taxilanes located in ODAV's landside area. Several vehicular/pedestrian deviations (V/PD) have occurred on the Airport in recent years. ODAV has been working with the FAA Runway Safety Action Team (RSAT) to increase opportunities for safety on the airfield.

- FACILITY REQUIREMENT. Existing on-airport surface roads on ODAV property should be maintained and updated as required to serve future landside development identified in the development alternatives analysis.
- FACILITY GOAL. A drivers training program could be established to promote on-airport drivers safety.

VEHICLE PARKING

Within the ODAV Terminal Area vehicle parking is limited and should be considered when conceptualizing new hangar construction to prevent vehicles parking on taxilanes, aprons, or object free areas.

- FACILITY REQUIREMENT. Maintain the existing vehicle parking facilities and consider vehicle parking when conceptualizing new hangar construction to prevent vehicles parking on taxilanes, aprons, or object free areas.

AIRPORT FENCING

The entire airport facility is fenced with designated vehicle gates. The existing fencing and gates are in good condition.

- FACILITY REQUIREMENT. Maintain the existing perimeter fencing/access gates, and update as required by future improvements identified in the development alternatives analysis.

Airport Administration Goals and Requirements

Airport administration goals and requirements include recommendations and best practices for airport ownership, facility management, finance, airport user rates and charges, and compliance with FAA grant assurances.

Goals related to ODAV's management of the Aurora State Airport, consistent with its current and future operational requirements, are provided for each administrative category listed below.

AIRPORT OWNERSHIP AND MANAGEMENT

The Aurora State Airport is owned and operated by ODAV. ODAV manages the Aurora State Airport among a group of 28 state-owned or -operated airports with 15.5 full-time equivalent (FTE) employees based in Salem. As the airport owner (sponsor), ODAV is responsible for managing operations and coordinating with applicable local jurisdictions as well as state and federal agencies. Much of the day-to-day operations and maintenance for the Aurora State Airport are completed by full-time ODAV staff with additional staff resources (part-time or contracted), as needed. ODAV currently has six FTE employees assigned to the daily maintenance and operation of the Aurora State Airport.

AIRPORT FINANCE

Based on a review of the recent financial records presented in Chapter 2 – Existing Conditions Analysis, the Airport's revenues only slightly exceed expenses for normal operations and day-to-day maintenance. Based on the current level of operating revenues and expenses, ODAV is dependent on state and federal grants to fund major capital improvements and ongoing pavement maintenance projects.

An analysis of revenues generated at the Airport indicates that TTF access fees account for 18.5% of total airport operating revenue and fuel flowage fees (all aircraft) account for approximately 43% of airport revenues. It is worth noting that TTF-based aircraft account for 82% of the Airport's based aircraft total, but contribute a significantly lower percentage of total airport revenues. A review of current airport business planning may be considered to evaluate support of increased operations, maintenance, and capital costs required to satisfy future user demand.

FAA GRANT ASSURANCES AND COMPLIANCE OVERVIEW

Upon a review of local, state, and federal regulations, ODAV is understood to be in compliance with all requirements related to the Aurora State Airport. A detailed discussion of the applicable regulations is presented in Chapter 2 – Existing Conditions Analysis.

- FACILITY GOAL. Maintain current efforts to work with state and federal partners to ensure continued compliance with state and federal regulations.

East Landside Area and Air Traffic Control Tower – Source: ODAV

Chapter 5

Alternatives Analysis

Introduction

As noted in the facility requirements evaluation, current and long-term planning for Aurora State Airport is based on maintaining and improving the Airport's ability to serve a range of general aviation aircraft, while also meeting Federal Aviation Administration (FAA) design standards. Existing facilities accommodate a wide variety of aircraft types including single- and multi-engine piston aircraft, turboprops, jets, and rotary-wing aircraft. The mix of aircraft activity at the Airport requires facility improvements capable of accommodating demand, while maintaining safety for all users. Non-conforming items identified in the facility requirements assessment will be addressed in the appropriate airside or landside development alternatives.

Preferred Alternative

The following section describes the proposed improvements for specific airside and landside facilities which have been consolidated into the preferred alternative depicted in **Figure 5-1**.

The recommended preferred alternative elements will be incorporated into the draft airport layout plan (ALP) and submitted to FAA for formal review. The ALP drawing set is presented in Chapter 6.

2021-2041 PREFERRED ALTERNATIVE

Airside Facilities (Runway/Taxiway System)

The primary focus for airside improvements is to implement changes to the runway and taxiway environment with the goal of meeting FAA design standards, specifically runway and taxiway object free area (ROFA and TOFA) and runway and taxiway safety area (RSA and TSA) standards. The most notable projects are summarized below:

- Shift Highway 551 (Hubbard Highway) and right-of way approximately 80 feet west to clear ROFA
- Reroute Keil Road east outside of ROFA

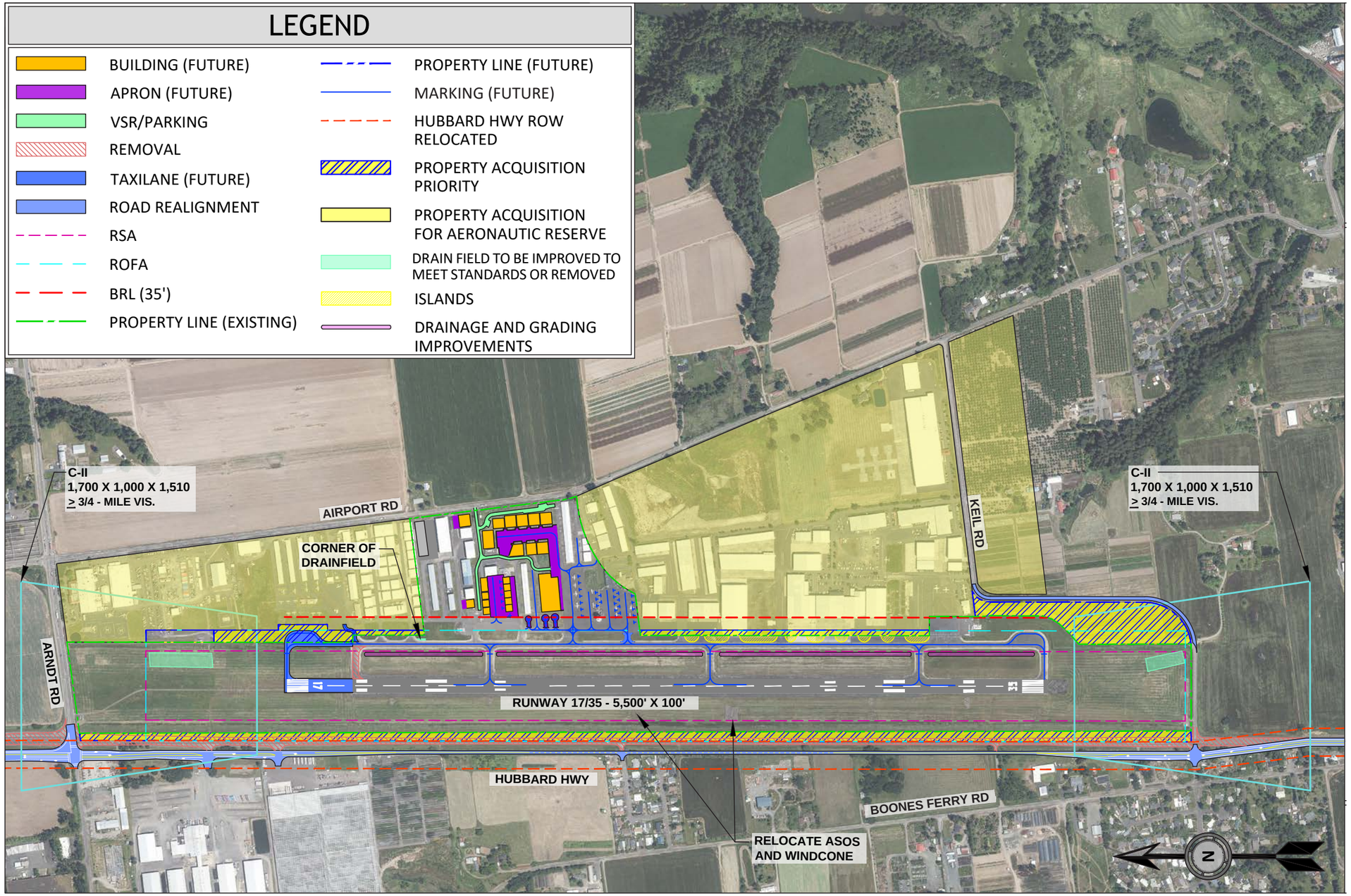
- Remove drainage ditch from RSA
- Extend Runway 17/35 and Taxiway A 497 feet north
- Septic drain fields located inside the existing and future RSA will be improved to meet FAA surface gradient and load bearing standards, or removed if they cannot meet standards.
- Relocate the automated weather system (ASOS), segmented circle, and primary wind cone outside of the ROFA/RSA
- Acquire all property within the ROFA and TOFAs (25 acres)
- Adjacent aeronautical properties are identified as an aeronautical reserve, to be acquired from willing sellers, for (152 acres)
- Approach visibility minimums remain 7/8-mile and RPZ dimensions remain 1,700 feet x 1,000 feet x 1,510 feet

Landside Facilities (Apron/Hangar Areas)

Improvements to the landside areas are intended to address demand for general aviation aircraft storage (hangar and apron parking), vehicle parking, gate access, and taxilane configurations to accommodate lateral clearance requirements for airplane design group (ADG) I and II aircraft. Proposed projects are summarized below:

- Reconfigure tiedowns and taxilanes on the air traffic control tower (ATCT) apron to meet lateral (object free area) clearance requirements
- Develop commercial hangars, aprons, and fixed base operator (FBO) facilities in currently undeveloped space north and east of the ATCT apron
- Redevelop existing flight school apron area to accommodate additional small aircraft hangars and tiedowns
- Add two large helicopter parking stands and one small helicopter parking stand north of ATCT apron
- Construct two additional hangars in remaining undeveloped airport property
- Construct airport service road on ODAV -owned property
  - » Existing ODAV -owned taxilanes will be used to route vehicles where a dedicated access road is not feasible
- Construct turf islands to remove direct runway access and control aircraft movement on and off adjacent privately-owned through-the-fence (TTF) apron areas. Islands may be painted as an interim solution.

FIGURE 5-1: PREFERRED ALTERNATIVE



CENTURY WEST ENGINEERING

Development Alternatives Analysis Process

PREFERRED ALTERNATIVE SELECTION PROCESS AND TIMELINE

The Preliminary Alternatives were developed and presented for public review in June 2024 in two public meetings:

- **Planning Advisory Committee (PAC) Meeting #6 (June 7th, 2024)**
- **Airport Master Plan Open House at Aurora High School (June 13th, 2024)**

The Preliminary Alternatives were posted on the project webpage for public review.

Following an extended public review period, the preliminary alternatives were refined based on feedback provided by the PAC, airport users, the community, and FAA. The Refined Preliminary Alternatives were then presented at a supplemental PAC working session to provide an additional opportunity for PAC review and general public participation:

- **PAC Working Session #3 (July 30th, 2024)**

The Refined Preliminary Alternatives were posted on the project website for public review.

Input received in PAC Working Session #3, and provided during an extended public review period was used to further refine the alternatives. The input provided by the PAC, airport users, the community, and FAA was incorporated into the Preliminary Preferred Alternative that was presented to the PAC and public:

- **PAC Meeting #7 (October 15th, 2024)**

The Preliminary Preferred Alternative was posted on the project website for public review.

Input received in PAC Meeting #7, and during the extended public comment period, prompted the project team to hold a listening session in PAC Meeting #8 to gather additional input from the PAC and the public related to the preliminary preferred alternative:

- **PAC Meeting #8 (December 10th, 2024)**

Input received in PAC Meeting #8, and provided during the subsequent public review period was considered by ODAV in its selection of the Airport Master Plan's Preferred Alternative that was presented to the PAC and public:

- **PAC Meeting #9 (February 11th, 2025)**

The Preferred Alternative was posted on the project website for public review.

The elements of the preferred alternative were incorporated into the airport layout plan (ALP) drawing set, and the refinement of the master plan's 20-year capital improvement program (CIP). These items, along with previous master plan draft chapters/working papers are incorporated into the draft final airport master plan report that will be submitted to FAA for review. The draft final airport master plan will be posted on the project website for public review and comment. The final steps in the project are acceptance of the airport master plan as complete, FAA approval of the ALP drawing set, and local adoption of the master plan by the ODAV board.

The following section describes the preliminary development alternatives as the work products were presented in the timeline noted above.

PRELIMINARY ALTERNATIVES - AIRSIDE

Seven Preliminary Alternatives for the airside features were developed and presented to the PAC. The Preliminary Airside Alternatives concepts were intentionally schematic in nature as they were intended to facilitate discussions surrounding the "big questions" that would guide ODAV on how to best meet the facility requirements identified in Chapter 4. These "big questions" include:

1. Should the runway be extended to the north or to the south?
2. To achieve a clear ROFA, should the runway be shifted east to clear Hubbard Highway, or should Hubbard Highway shift west?

The airside concepts primarily focused on bringing the Runway 17/35 ROFA and RSA into compliance with FAA standards and to maintain compliance for the preferred design. Other non-conforming items such as incompatible land uses in Runway Protection Zones (RPZ), vehicle/pedestrian deviations (V/PD)issues, and mitigating airspace obstacles were to be evaluated further once the preliminary development alternatives had been narrowed to the most viable options.

As noted in Chapter 4, RPZ dimensions are determined by the aircraft approach category and airplane design group (AAC/ADG) associated with the design aircraft and the lowest approach visibility minimums available for the runway. For each airside development alternative, two sizes of RPZs were depicted to allow direct comparison for each concept. The larger RPZ footprint corresponds to the FAA-defined RPZ visibility increment (≥ 3/4-mile) nearest to the 7/8-mile visibility minimums approved by the FAA for the runway's current non-precision instrument approaches. The smaller RPZ footprint corresponds to the next higher increment of visibility minimums (1-mile) commonly used for instrument flight procedures. FAA land use compatibility guidelines and airport control standards are applied to RPZs, including any portions that extend beyond airport property.

Preliminary Airside Alternatives 1 through 4 were configured to accommodate AAC/ADG C-II aircraft, which is consistent with the existing and future critical aircraft identified in Chapter 3. Preliminary Airside Alternatives 5 through 7 envisioned a downsizing of the Airport allowing the use of AAC/ADG B-II standards. Prior to PAC Meeting #6, FAA Seattle Airports District Office (ADO) reviewed the Preliminary Airside Alternatives and informed the planning team that based on the current and projected activity levels by C-II aircraft, downsizing to B-II standards is not a feasible solution and recommended that concepts depicting B-II standards be removed. As a result, Preliminary Alternatives 5 through 7 were removed from consideration.

Preliminary Airside Alternatives 1 through 7 are depicted in **Figures 5-4 through 5-10**.

AAC/ADG C-II Preliminary Airside Alternatives

Preliminary Airside Alternative 1 (Figure 5-4) shows the runway extended 497 feet to the north along its existing alignment. Hubbard Highway and Keil Road are realigned to remove them from the ROFA. Septic drain fields in the existing and future RSAs are identified as non-standard conditions. Minimal property acquisition is proposed on the east side to gain control of the entire ROFA and facilitate realigning Keil Road.

Preliminary Airside Alternative 2 (Figure 5-5) is similar to Preliminary Airside Alternative 1 except it shows the runway extended 497 feet to the south. Hubbard Highway and Keil Road are realigned to remove them from the ROFA. Since the proposed runway extension is depicted to the south, only the septic drain field on the south end of the property is identified as non-standard. Property acquisition along the east side is again proposed to gain control of the ROFA and realign Keil Road. Additional property acquisition is identified south of the existing property boundary to facilitate the extension of the RSA and ROFA to the south.

Preliminary Airside Alternative 3 (Figure 5-6) shows realigning the runway and parallel taxiway east of the existing alignments to deconflict the ROFA and Hubbard Highway. The runway is extended 497 feet to the north. Shifting the runway east allows Hubbard Highway to remain in its current location, but the impacts on the east are more pronounced compared to the previous two concepts. Additional property acquisition would be required on the east including properties that currently house existing aeronautical facilities. Septic drain fields located in the existing and future RSAs are identified as non-standard conditions.

Preliminary Airside Alternative 4 (Figure 5-7) is similar to Preliminary Airside Alternative 3 with the exception of the runway extension. The runway and parallel taxiway are realigned to the east but extended to the south. Property impacts on the east are similar to those in Preliminary Airside Alternative 3. Additional property acquisition at the south end of the property and a more extensive realignment of Keil Road are required to accommodate the proposed runway extension. The drain field in the south end of the RSA is identified as non-standard.

AAC/ADG B-II Preliminary Airside Alternatives

Preliminary Airside Alternatives 5 through 7 assumed that the runway and taxiway system could be downsized to AAC/ADG B-II allowing less restrictive B-II standards to be employed. Operational changes required to realize B-II use criteria were not identified. As previously discussed, prior to PAC meeting #6, the FAA Seattle ADO indicated that the B-II concepts were not feasible as they don't address standards based on the existing and future critical aircraft (AAC/ADG C-II) and they should be removed from consideration. This information is presented without revision to document the public record.

Preliminary Airside Alternative 5 (Figure 5-8) depicts downgrading the airfield to meet AAC/ADG B-II standards. The runway is narrowed to 75 feet, extended 647 feet to the north, and shortened by 150 feet on the south end to remove Keil Road from the 1-mile RPZ on the south end while achieving a total runway length to 5,500 feet. Minor property acquisition is required on the north to accommodate the extended parallel taxiway.

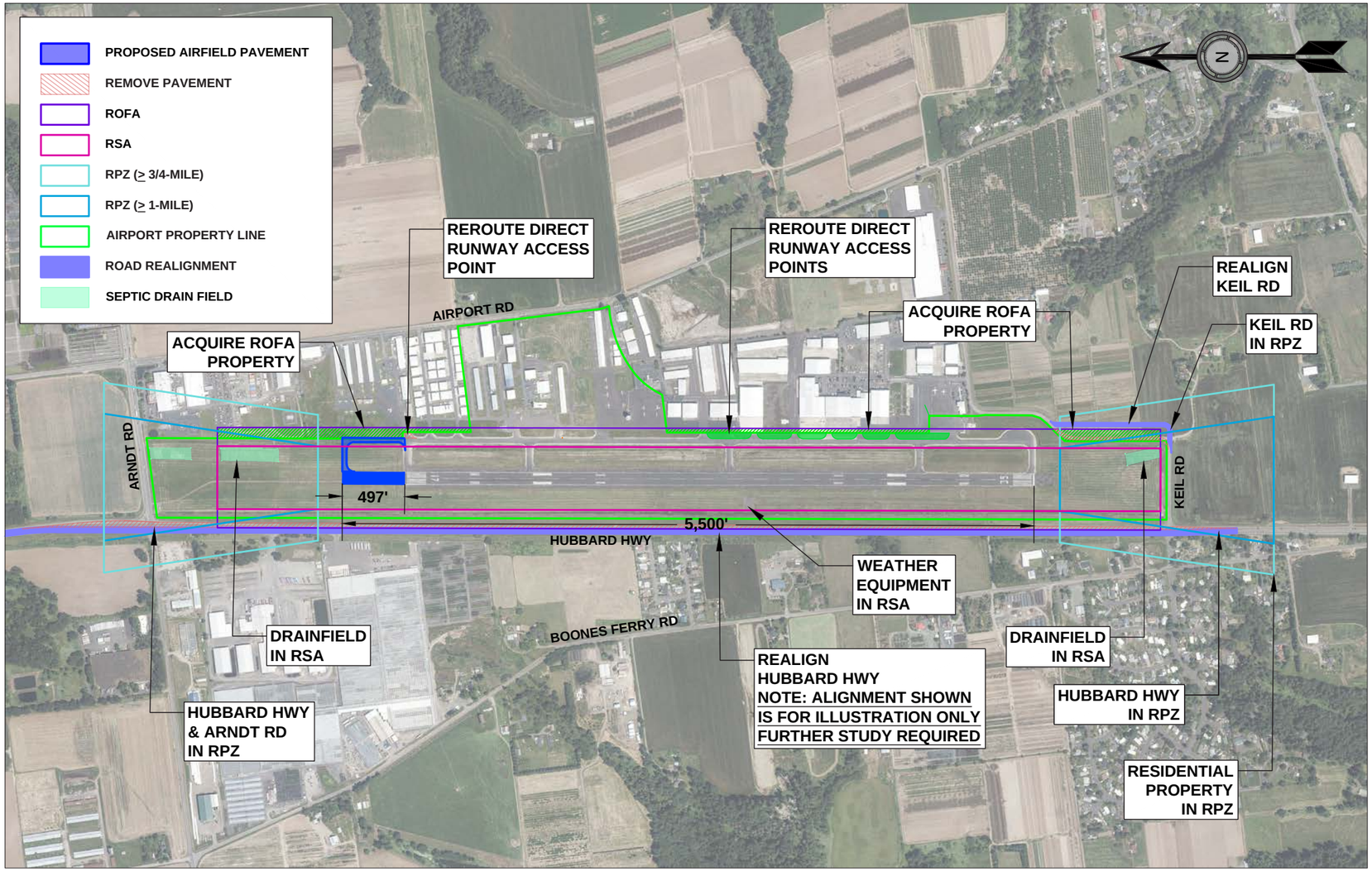
This alternative was removed from consideration based on FAA input.

Preliminary Airside Alternative 6 (Figure 5-9) is nearly identical to Preliminary Airside Alternative 5 except the runway and parallel taxiway are extended south. The south extension necessitates rerouting Keil Road around the extended TOFA and ROFA

This alternative was removed from consideration based on FAA input.

Preliminary Airside Alternative 7 (Figure 5-10) maintains the existing runway length of 5,003 feet while shifting the runway 150 feet north to remove Keil Road from the 1-mile RPZ.

This alternative was removed from consideration based on FAA input.



Maintain C-II, Realign Hubbard Highway and Extend Runway North

Primary Components:

- Realigns Hubbard Highway outside of ROFA. As proposed, the highway is shifted approximately 30 to 35 feet west, within existing ODOT-owned highway right-of-way.
  - » Note: The roadway alignment depicted is for illustration only. Further study and coordination with ODOT will be required to identify final roadway alignment needed to clear/control ROFA.
- Maintains 100 feet runway width (C-II standard).
- Extends runway 497 feet to the north resulting in a total length of 5,500 feet.
- Extends parallel taxiway (Taxiway A) to the north with runway.
- Property acquisition is required to accommodate east sections of ROFA (northeast and southeast).
- Keil Road is realigned to the outside of the ROFA.
- Reconfigure/relocate existing TTF access taxiway connection at current north end of Taxiway A to remove direct runway access at that location.
  - » Realigned TTF access to be coordinated with adjacent property owner.
- Install painted islands between Taxiway A and the adjacent southern TTF properties to address direct runway access and V/PD issues.

Issues Addressed by Alternative:

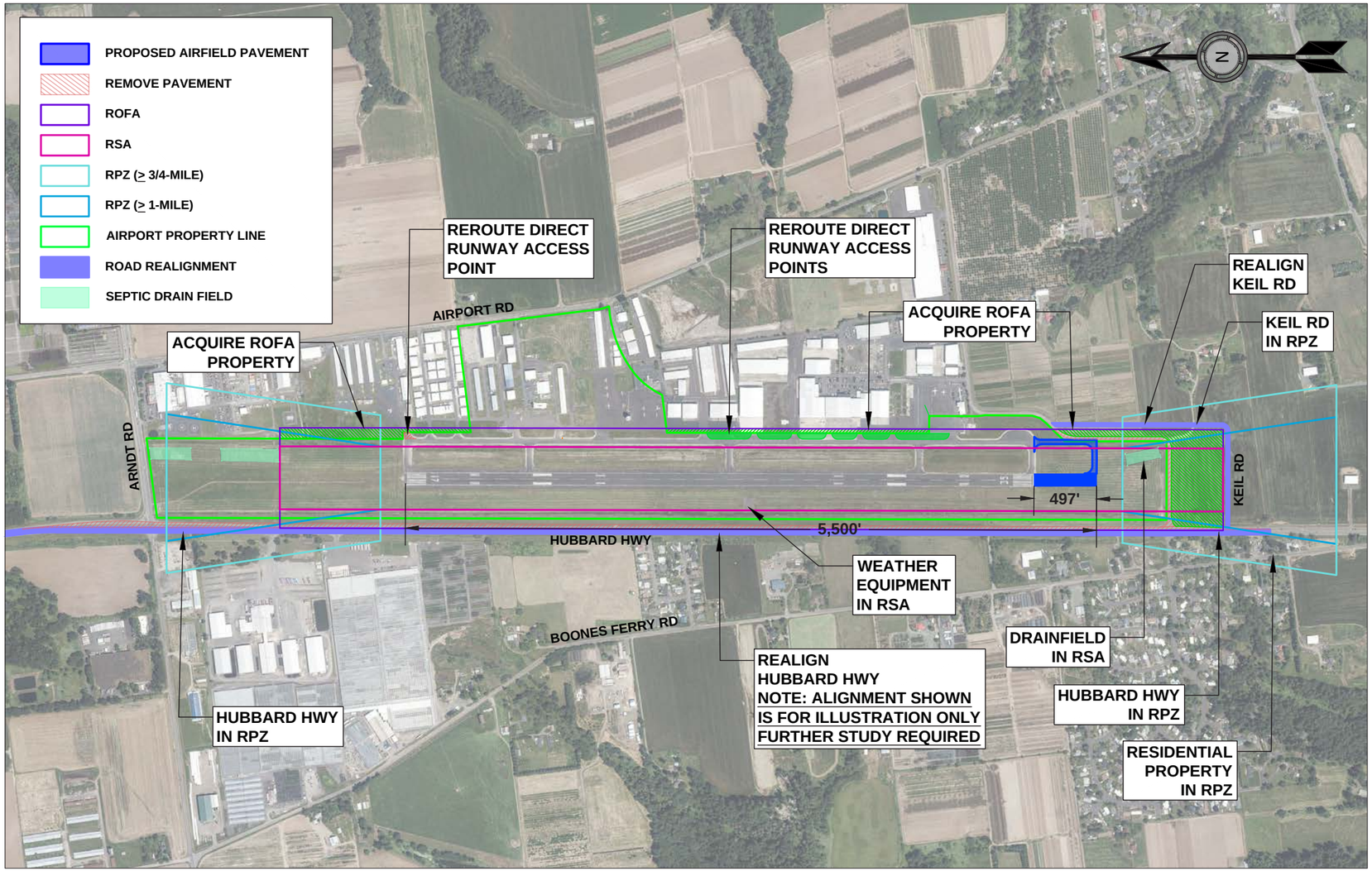
- Extends runway to justified length of 5,500 feet.
- Clears ROFA of existing public roads.
- Airport control of ROFA achieved through property acquisition.
- Addresses direct runway access and V/PD issues through pavement removal and painted islands.

Other Issues to be Addressed:

- Septic drainfield remains in south end of RSA.
  - » Further study is required to relocate drainfield out of RSA.
- Wind cone and weather equipment (ASOS) remain in RSA and ROFA.
  - » Further study is required to identify new locations for equipment.
- Existing incompatible land uses (Hubbard Highway, Keil Road, Boones Ferry Road and residential areas) remain in RPZs.

New Issues:

- New incompatible land use (Arndt Road) in Runway 17 RPZ.
- Septic drainfield located in north end of extended RSA.
  - » Further study is required to relocate drainfield out of future RSA.



Maintain C-II, Realign Hubbard Highway and Extend Runway South

Primary Components:

- Realigns Hubbard Highway outside of ROFA. As proposed, the highway is shifted approximately 30 to 35 feet west, within existing ODOT-owned highway right-of-way.
  - » Note: The roadway alignment depicted is for illustration only. Further study and coordination with ODOT will be required to identify the final roadway alignment needed to clear/control ROFA.
- Maintains 100-foot runway width (C-II standard).
- Extends runway 497 feet to the south resulting in a total length of 5,500 feet.
- Extends parallel taxiway (Taxiway A) to the south with runway.
- Property acquisition is required to accommodate east sections of ROFA (northeast and southeast).
- Keil Road is realigned to the outside of the existing and future ROFA.
- Reconfigure/relocate existing TTF access taxiway connection at current north end of Taxiway A to remove direct runway access at that location.
  - » Realigned TTF access to be coordinated with adjacent property owner.
- Install painted islands between Taxiway A and the adjacent southern TTF properties to address direct runway access and V/PD issues.

Issues Addressed by Alternative:

- Extends runway to justified length of 5,500 feet.
- Clears ROFA of existing public roads.
- Airport control of ROFA achieved through property acquisition.
- Addresses direct runway access and V/PD issues through pavement removal and painted islands.

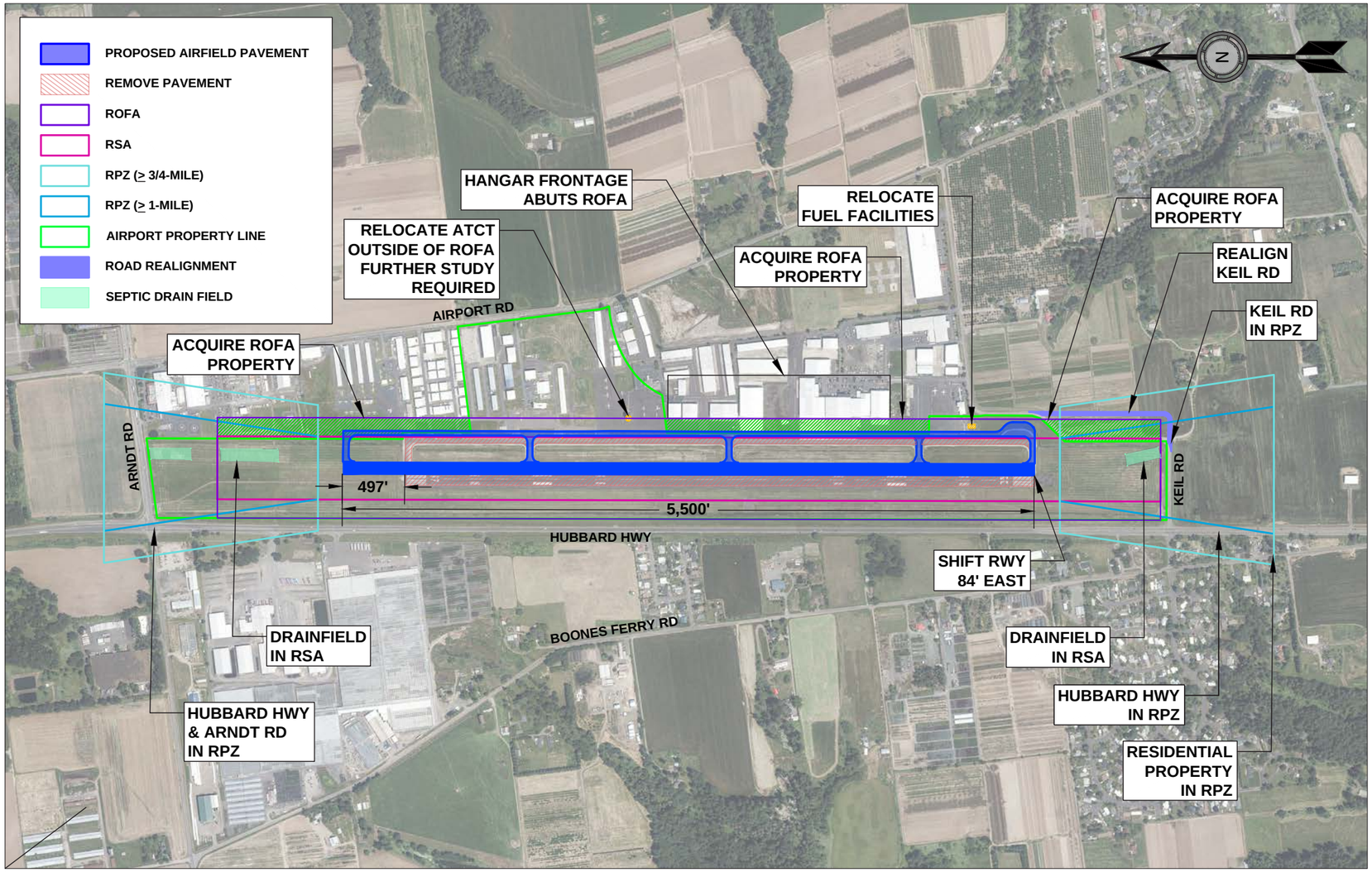
Other Issues to be Addressed:

- Septic drainfield remains in south end of RSA.
  - » Further study is required to relocate drainfield out of RSA.
- Wind cone and weather equipment (ASOS) remain in RSA and ROFA.
  - » Further study is required to identify new locations for equipment.
- Existing incompatible land uses (Hubbard Highway, Keil Road, Boones Ferry Road and residential areas) remain in RPZs.

New Issues:

- Additional incompatible land uses (residential properties, and realigned Keil Road) enter Runway 35 RPZ.
- Requires relocation/replacement or decommissioning of localizer navigational aid (located at Runway 35 end).

FIGURE 5-6: PRELIMINARY AIRSIDE ALTERNATIVE 3



Maintain C-II, Shift Runway East, and Extend Runway North

Primary Components:

- Shifts runway 84 feet east to bring west edge of ROFA onto Airport property.
- All runway and parallel taxiway surfaces (ROFA, RSA, OFZ, RPZ, etc.) are shifted east based on the shifted runway centerline location.
- ATCT and other aviation use facilities (fuel, helicopter parking, etc.) to be relocated outside of ROFA.
  - » Further study is required to determine new locations.
- Maintains 100-foot runway width (C-II standard).
- Extends runway 497 feet to the north resulting in a total length of 5,500 feet.
- Extends parallel taxiway (Taxiway A) to the north with runway.
- All property within the shifted/extended ROFA not owned by the Airport to be acquired.
- Keil Road is realigned to the outside of the ROFA.
- Reconfigure/relocate existing TTF access taxiway connection at current north end of Taxiway A to remove direct runway access at that location.
  - » Realigned TTF access to be coordinated with adjacent property owner.
- Install painted islands between shifted Taxiway A and the adjacent southern TTF properties, where feasible to address direct runway access and V/PD issues.

Issues Addressed by Alternative:

- Extends runway to justified length of 5,500 feet.
- Clears ROFA of existing public roads.
- Airport control of ROFA achieved through property acquisition.
- Direct runway access and V/PD issues to be addressed in redesign of Taxiway A.
- Wind cone and ASOS are no longer in ROFA or RSA.

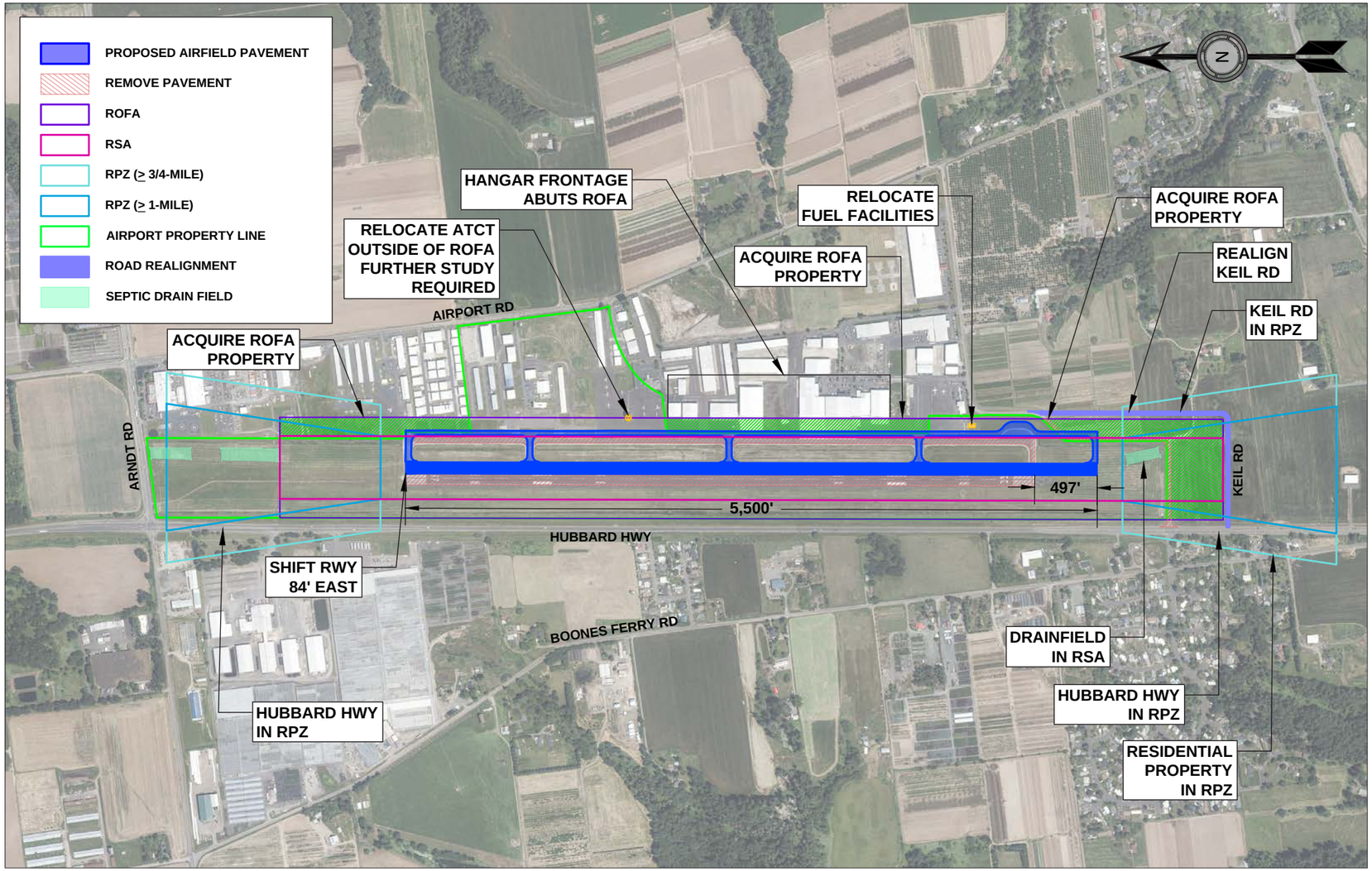
Other Issues to be Addressed:

- Septic drainfield remains in south end of RSA.
  - » Further study required to relocate drainfield out of RSA.
- Existing incompatible land uses (Hubbard Highway, Keil Road, Boones Ferry Road and residential areas) remain in RPZs; some mitigated by runway shift.

New Issues:

- ATCT must be relocated/reconstructed outside of ROFA.
- Atlantic Aviation fuel equipment to be relocated outside of ROFA.
- ROFA directly abuts hangar doors for south TTF properties.
- The septic drainfield is located in the north end of (extended) RSA.
  - » Further study required to relocate drainfield out of future RSA.
- New incompatible land use (Arndt Road) in Runway 17 RPZ.
- Requires relocation/replacement or decommissioning of localizer navigational aid.

FIGURE 5-7: PRELIMINARY AIRSIDE ALTERNATIVE 4



Maintain C-II, Shift Runway East, and Extend Runway South

Primary Components:

- Shift runway 84 feet east to bring west edge of ROFA onto Airport property.
- Extends runway 497 feet to the south resulting in a total length of 5,500 feet.
- Maintains 100-foot runway width (C-II standard).
- Extends parallel taxiway (Taxiway A) to the south with runway.
- All runway and parallel taxiway surfaces (ROFA, RSA, OFZ, RPZ, etc.) are shifted east with shifted runway centerline.
- ATCT and other aviation use facilities (fuel, helicopter parking, etc.) to be relocated outside of ROFA.
  - » Further study is required to determine new locations.
- All property within the shifted/extended ROFA not owned by the Airport to be acquired.
- Keil Road is realigned to the outside of the existing and future ROFA.
- Reconfigure/relocate existing TTF access taxiway connection at current north end of Taxiway A to remove direct runway access at that location.
  - » Realigned TTF access to be coordinated with adjacent property owner.
- Install painted islands between shifted Taxiway A and the adjacent southern TTF properties, where feasible to address direct runway access and V/PD issues.

Issues Addressed by Alternative:

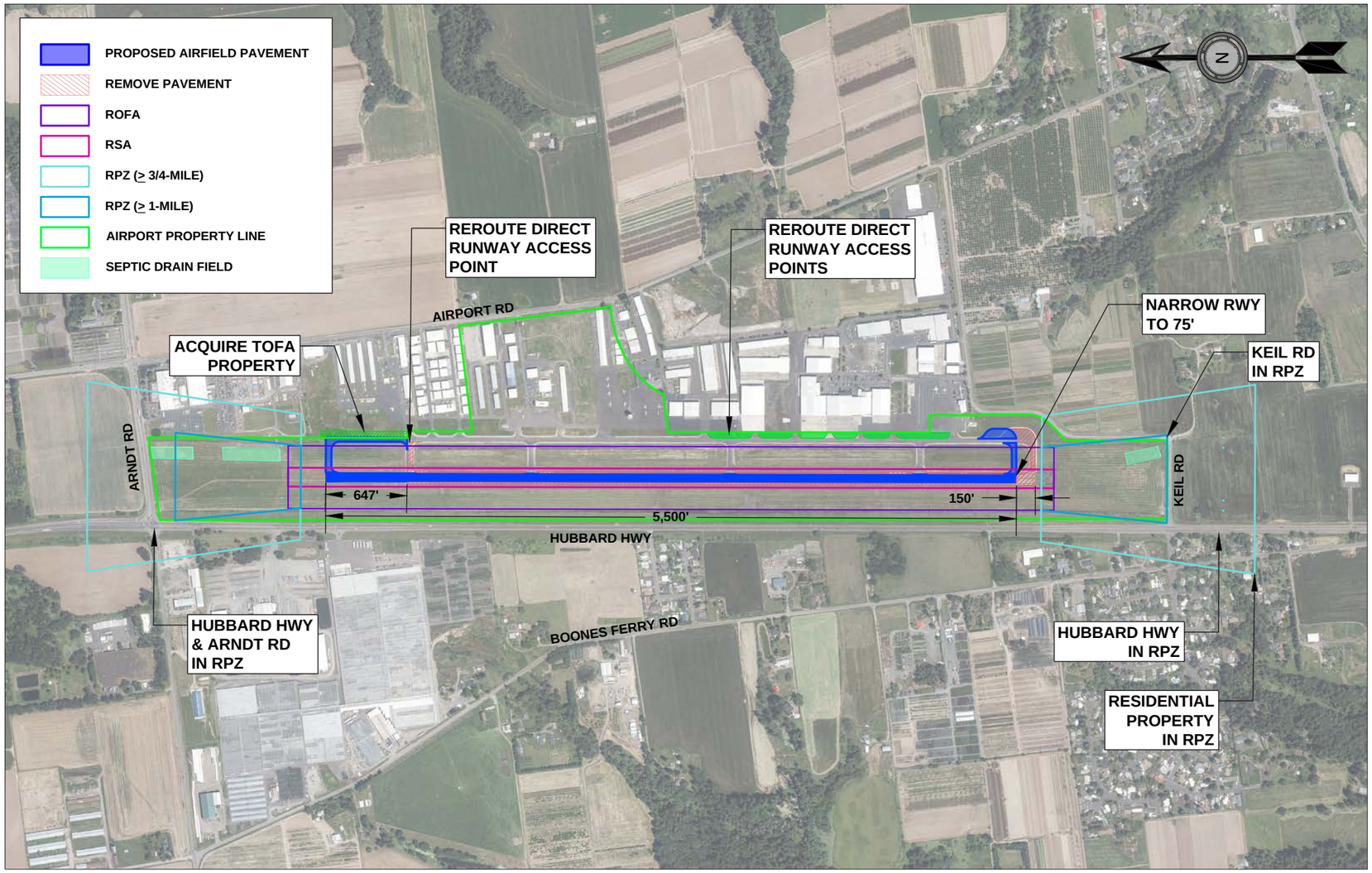
- Extends runway to justified length of 5,500 feet.
- Clears ROFA of existing public roads.
- Airport control of ROFA achieved through property acquisition.
- Direct runway access and V/PD issues to be addressed in redesign of Taxiway A.
- Wind cone and ASOS are no longer in ROFA or RSA.

Other Issues to be Addressed:

- Septic drainfield remains in south end of RSA.
  - » Further study required to relocate drainfield out of RSA.
- Existing incompatible land uses (Hubbard Highway, Keil Road, Boones Ferry Road and residential areas) remain in RPZs; some mitigated by runway shift.

New Issues:

- ATCT must be relocated/reconstructed outside of ROFA.
- Atlantic Aviation fuel equipment to be relocated outside of ROFA.
- ROFA directly abuts hangar doors for south TTF properties.
- Additional incompatible land uses (residential properties, and realigned Keil Road) enter Runway 35 RPZ.
- Requires relocation/replacement or decommissioning of localizer navigational aid (located at Runway 35 end).



Change to B-II, Shift and Extend Runway North

Primary Components:

- Downgrades runway to AAC/ADG B-II.
  - » Operational changes to realize B-II use criteria requires further study.
- Narrows runway to 75 feet (B-II standard).
- Extends runway to justified length of 5,500 feet.
  - » Relocate Runway 35 end 150 feet north to bring RPZ (≥1-mile) onto existing property.
  - » Extend Runway 17 end 647 feet north.
- Extends parallel taxiway (Taxiway A) to the north with runway.
- Acquire property in extended TOFA at north end of future parallel taxiway.
- Remove connector taxiway A1 at north end of Taxiway A to eliminate direct runway access at that location.
- Install painted islands between Taxiway A and the adjacent southern TTF properties to address direct runway access and V/PD issues.

Issues Addressed by Alternative:

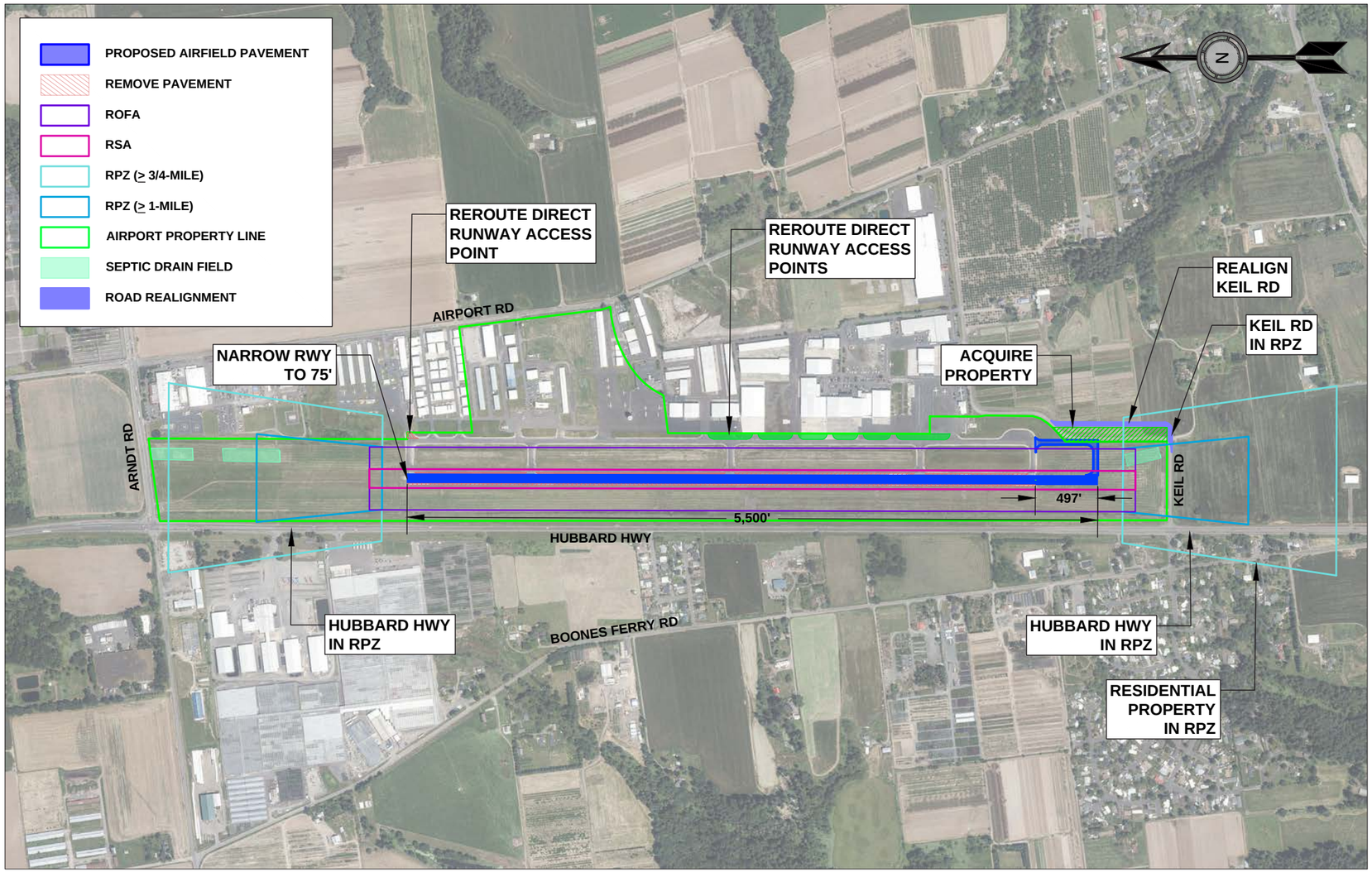
- Extends runway to justified length of 5,500 feet.
- ROFA is clear of existing public roads.
- Airport control of ROFA is achieved through reduction in surface dimension.
- Addresses direct runway access and V/PD issues through pavement removal and painted islands.
- Keil Road is outside of ROFA.
- Septic drainfields, wind cones, and weather equipment do not conflict with smaller RSA or OFA.
- Reduces incompatible land uses - Hubbard Highway, Keil Road, Boones Ferry Road and residential areas do not conflict with smaller > 1-mile RPZ.

Other Issues to be Addressed:

- Existing incompatible land uses (Hubbard Highway, Keil Road, Boones Ferry Road and residential areas) remain in larger > 3/4-mile RPZs.

New Issues:

- Operational changes required to maintain B-II standards (<500 C-II or larger annual operations).



Change to B-II, Extend Runway South

Primary Components:

- Downgrades runway to AAC/ADG B-II.
  - » Operational changes to realize B-II use criteria requires further study.
- Narrows runway to 75 feet (B-II standard).
- Extends runway 497 feet to the south resulting in a total length of 5,500 feet.
- Extends parallel taxiway (Taxiway A) to the south with runway.
- Acquire property in extended TOFA at south end of future parallel taxiway.
- Realign Keil Road outside TOFA.
- Install painted islands between Taxiway A and the adjacent southern TTF properties to address direct runway access and V/PD issues.
- Pavement removed at TTF access taxiway at the north end of Taxiway A to remove direct runway access at that location.
  - » Realigned TTF access to be coordinated with adjacent property owner.

Issues Addressed by Alternative:

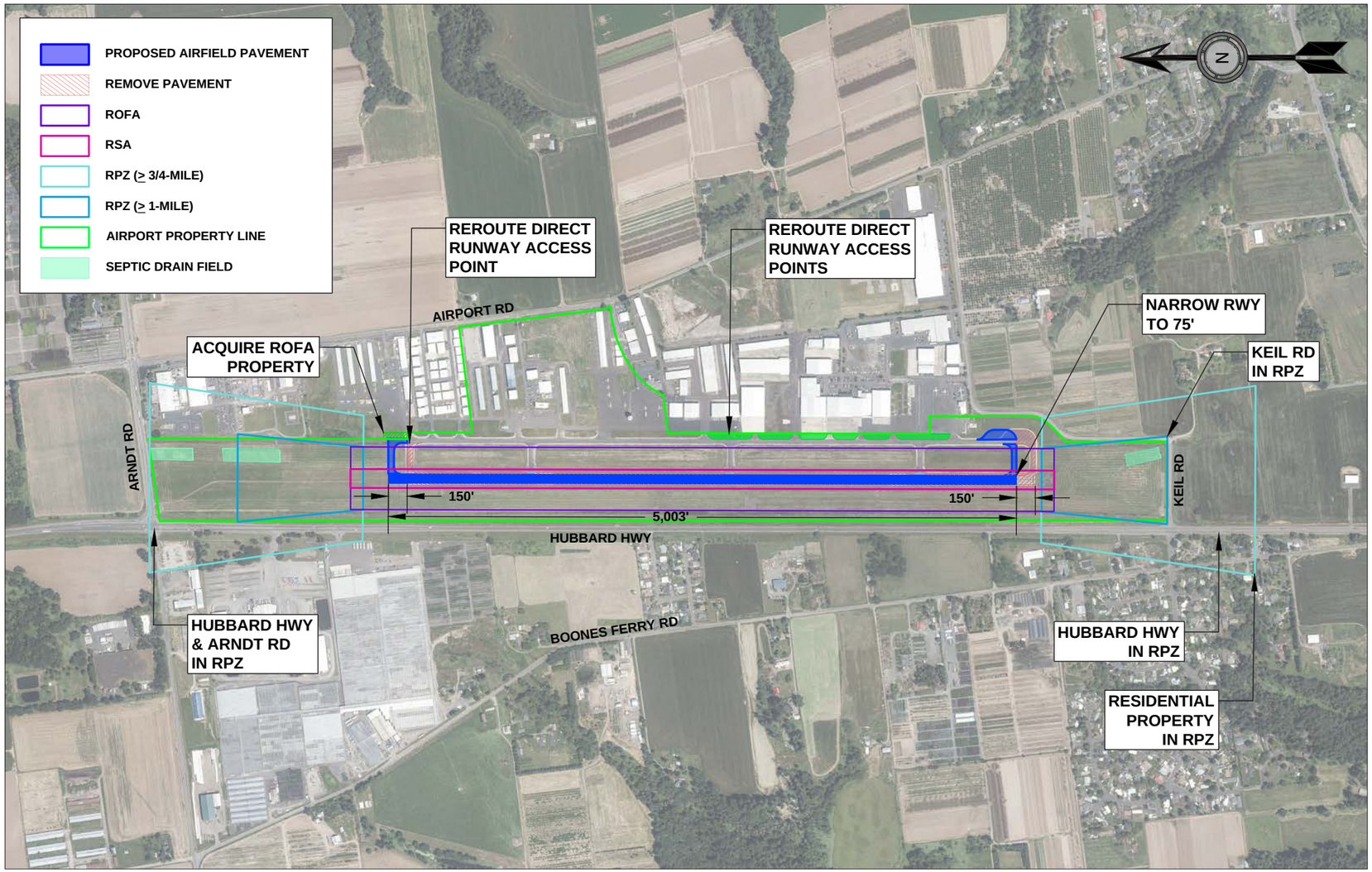
- Extends runway to justified length of 5,500 feet.
- ROFA is clear of existing public roads.
- Airport control of ROFA is achieved through reduction in surface dimension.
- Addresses direct runway access and V/PD issues through pavement removal and painted islands.
- Keil Road is outside of ROFA.
- Septic drainfields, wind cones, and weather equipment do not conflict with smaller RSA or OFA.
- Reduces incompatible land uses - Hubbard Highway, Keil Road, Boones Ferry Road and residential areas do not conflict with smaller > 1-mile RPZ.

Other Issues to be Addressed:

- Existing incompatible land uses (Hubbard Highway, Keil Road, Boones Ferry Road and residential areas) remain in larger > 3/4-mile RPZs.

New Issues:

- Operational changes required to maintain B-II standards (<500 C-II or larger annual operations).
- Requires relocation/replacement or decommissioning of localizer navigational aid (located at Runway 35 end).



Change to B-II, Shift Runway North, and Maintain Current Length

Primary Components:

- Downgrades runway to ADG/AAC B-II.
  - » Operational changes to realize B-II use criteria requires further study.
- Narrows runway to 75 feet (B-II standard).
- Maintains current runway length (5,003 feet).
  - » Shift entire runway 150 feet north to bring Runway 35 RPZ (≥ 1-mile) onto Airport property.
- Extends parallel taxiway (Taxiway A) to the north with runway.
- Remove/relocate existing Taxiway A1 connector at north end of Taxiway A in conjunction with runway-parallel taxiway shift; eliminates existing direct runway access at that location.
- Acquire property in extended TOFA at north end of future parallel taxiway.
- Install painted islands between Taxiway A and the adjacent southern TTF properties to address direct runway access and V/PD issues.

Issues Addressed by Alternative:

- ROFA is clear of existing public roads.
- Airport control of ROFA is achieved through reduction in surface dimension.
- Addresses direct runway access and V/PD issues through pavement removal and painted islands.
- Keil Road is outside of ROFA.
- Septic drainfields, wind cones, and weather equipment do not conflict with smaller RSA or OFA.
- Reduces incompatible land uses - Hubbard Highway, Keil Road, Boones Ferry Road and residential areas do not conflict with smaller > 1-mile RPZ.
- Direct runway access and V/PD issues addressed through painted islands and pavement removal.

Other Issues to be Addressed:

- Existing incompatible land uses (Hubbard Highway, Keil Road, Boones Ferry Road and residential areas) remain in larger > 3/4-mile RPZs.

New Issues:

- Operational changes required to maintain B-II standards (<500 C-II or larger annual operations).

PRELIMINARY ALTERNATIVES – LANDSIDE

The Three Preliminary Landside Alternatives presented below depict proposed improvements capable of meeting the facility requirements identified in Chapter 4. The proposed improvements are limited to the defined landside area on existing ODAV-owned property.

The facility configurations were compatible with the options presented in the preliminary airside concepts that maintain the current runway-taxiway location. A reduction in usable landside facilities would occur with the airside options shifting the runway-taxiway system east.

Aurora State Airport is located on a constrained site and as such, it may not be possible to fully meet every facility requirement. The focus of the landside evaluation is to identify the most efficient use of limited space, with aeronautical uses (aircraft storage) considered the highest and best use. This analysis will guide ODAV on the development of landside facilities during the current 20-year planning period, or until additional evaluations may be required.

The concepts are meant to be modular in nature. A selected preferred alternative may be as presented below, it may be a combination of components from different concepts, or it may be an entirely different concept identified in discussions stemming from these concepts.

Preliminary Landside Alternative 1A (Figure 5-11) is centered on a commercial hangar development with ADG II taxilane access accommodating standard taxilane object free areas (TLOFA), large FBO hangar, apron lease area, and vehicle access and parking. The main apron area is reconfigured to provide adequate wingtip clearances. The existing flight school apron and hangar area is reconfigured to provide additional hangar storage and tiedown parking. The flight school offices and classroom space would be accommodated in a new structure located on the northeast corner of the proposed apron. Two large helicopter parking positions and one small helicopter parking position are depicted near the proposed FBO hangar. Additional infill hangar development is depicted to show full build-out of the Airport-owned property.

Preliminary Landside Alternative 1B (Figure 5-12) is nearly identical to 1A with the following exceptions: A north/south vehicle service road (VSR) is proposed to provide dedicated vehicle access from the north boundary of the landside area to the south boundary of the landside area. To accommodate the VSR, the helicopter parking positions as well as six proposed small aircraft tiedown parking positions were removed from this concept. Two small aircraft tiedown parking positions were added adjacent to the VSR in the space previously shown as large helicopter parking positions. Additional infill hangar development is depicted to show full build-out of the Airport-owned property.

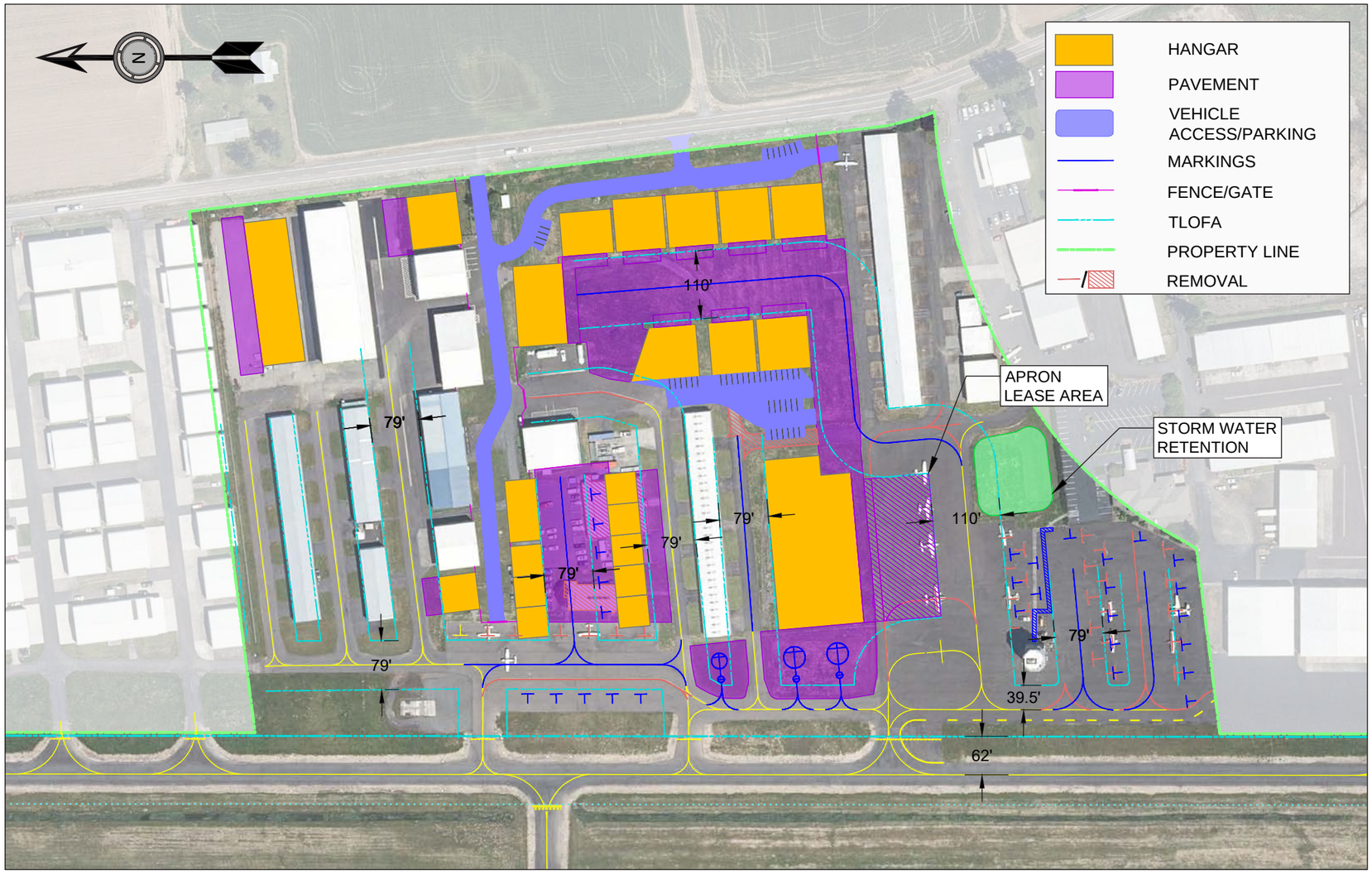
Preliminary Landside Alternative 2 (Figure 5-13) is again centered on a commercial hangar development with ADG II taxilane access, large FBO hangar, and vehicle access and parking. The apron lease area depicted in 1A is replaced by an ADG taxilane and small aircraft tiedown parking. The main apron is reconfigured to include two large aircraft pull through parking positions with small aircraft tiedown parking around the perimeter of the apron. The flight school apron remains as it is currently configured, but additional commercial and condo-style hangars are added to replace the existing t-hangars to the south and the large hangar to the east. Additional infill hangar development is depicted to show full build-out of the Airport-owned property.

The figures below provide additional details on proposed pavement configurations and markings that are referenced in the preliminary airside and landside concepts.

Figure 5-14 depicts a proposed reconfiguration of the existing TTF taxilane connection to Taxiway A1. The change in configuration would create a new taxi route between the adjacent apron and the runway, including a 90-degree turn to access Taxiway A and a second 90-degree turn to access Taxiway A1. This would eliminate the direct aircraft access configuration on Taxiway A1. The proposed changes require a new taxiway section and coordination with the adjacent private property owner. It is noted that a portion of this private property is also located in the ROFA for the existing Runway 17/35, which is recommended for property acquisition to meet FAA standards.

Figure 5-15 depicts proposed painted islands in the large expanse of airfield pavement to differentiate the apron and parallel taxiway. Limiting the number of direct access points from adjacent aircraft aprons to parallel taxiways is consistent with FAA design guidance. Aircraft movement and hangar access on the apron would be consolidated for the existing TTF users. Longer-term improvements may replace the painted markings with pavement removal as part of a major taxiway reconstruction project that may require additional stormwater drainage improvements.

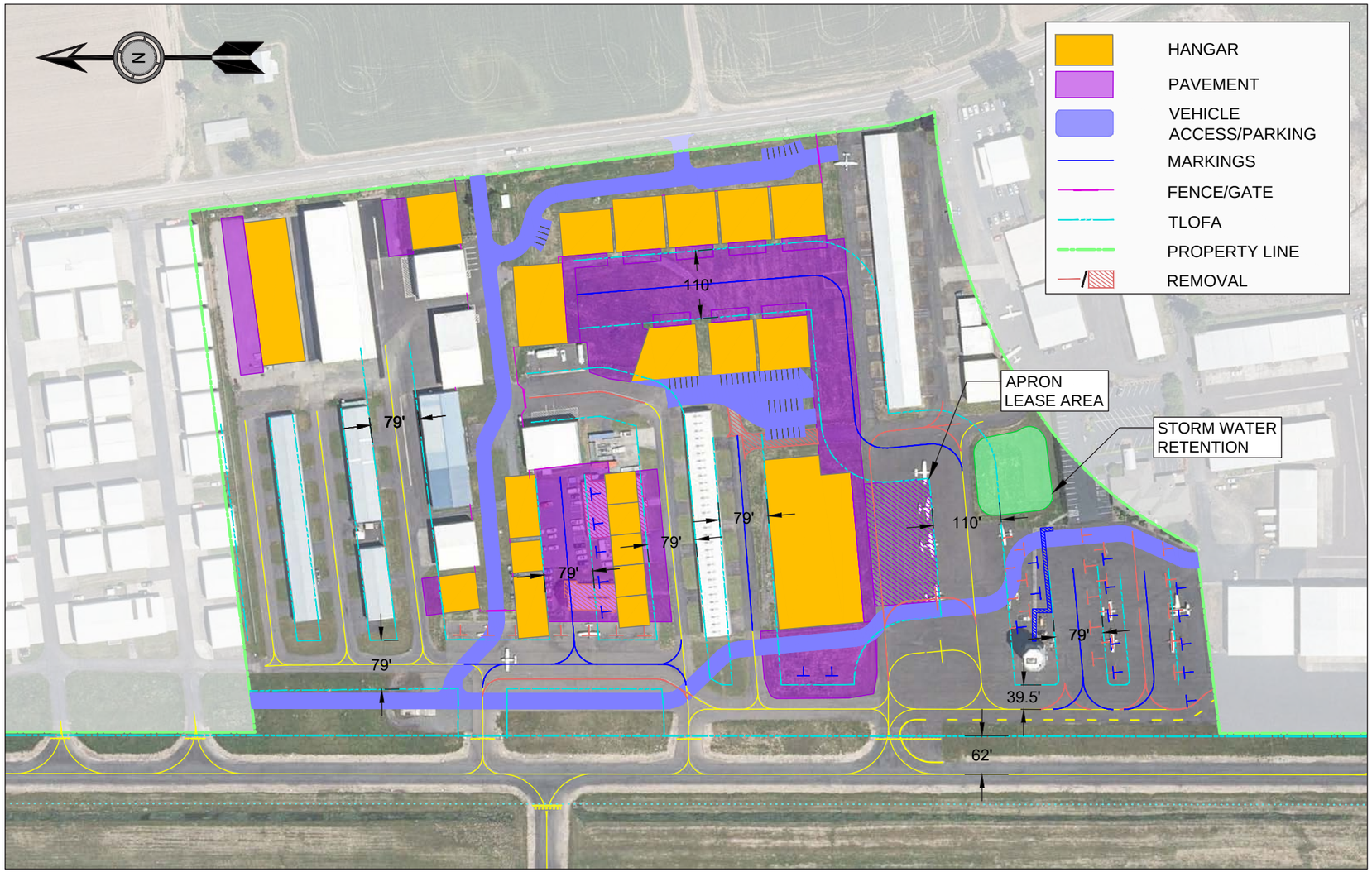
FIGURE 5-11: PRELIMINARY LANDSIDE ALTERNATIVE 1A



Commercial Hangar and FBO Development with Reconfigured Flight School Apron

Primary Components:

- Commercial hangar development with ADG II taxilane access, large FBO hangar, vehicle access and parking.
- The existing apron south of proposed FBO hangar proposed as tenant lease in conjunction with main ADG II access taxilane shift .
- Reconfigured small airplane tiedown apron adjacent to ATCT to provide appropriate wingtip and meet ADG I TOFA clearances.
- Proposed apron reconfiguration to meet FAA standards results in a net decrease of four small airplane tiedowns and one large aircraft drive through parking position compared to the current aircraft parking configuration.
- Two large helicopter (35-foot rotor) parking positions and one small helicopter (25-foot rotor) parking positions are added.
- Realigned taxilane west of current Aurora Flight School facility to accommodate five additional small airplane tiedowns.
- New apron at current flight school area.
- Reconfigured fence and vehicle access road (outside the fence access provided to Aurora Flight School facility).
- Additional hangar infill is proposed for all available lots on the Airport.
- Approximately 154,000 square feet of additional hangar space, as depicted.
- Storm water retention area is identified east of ATCT apron.

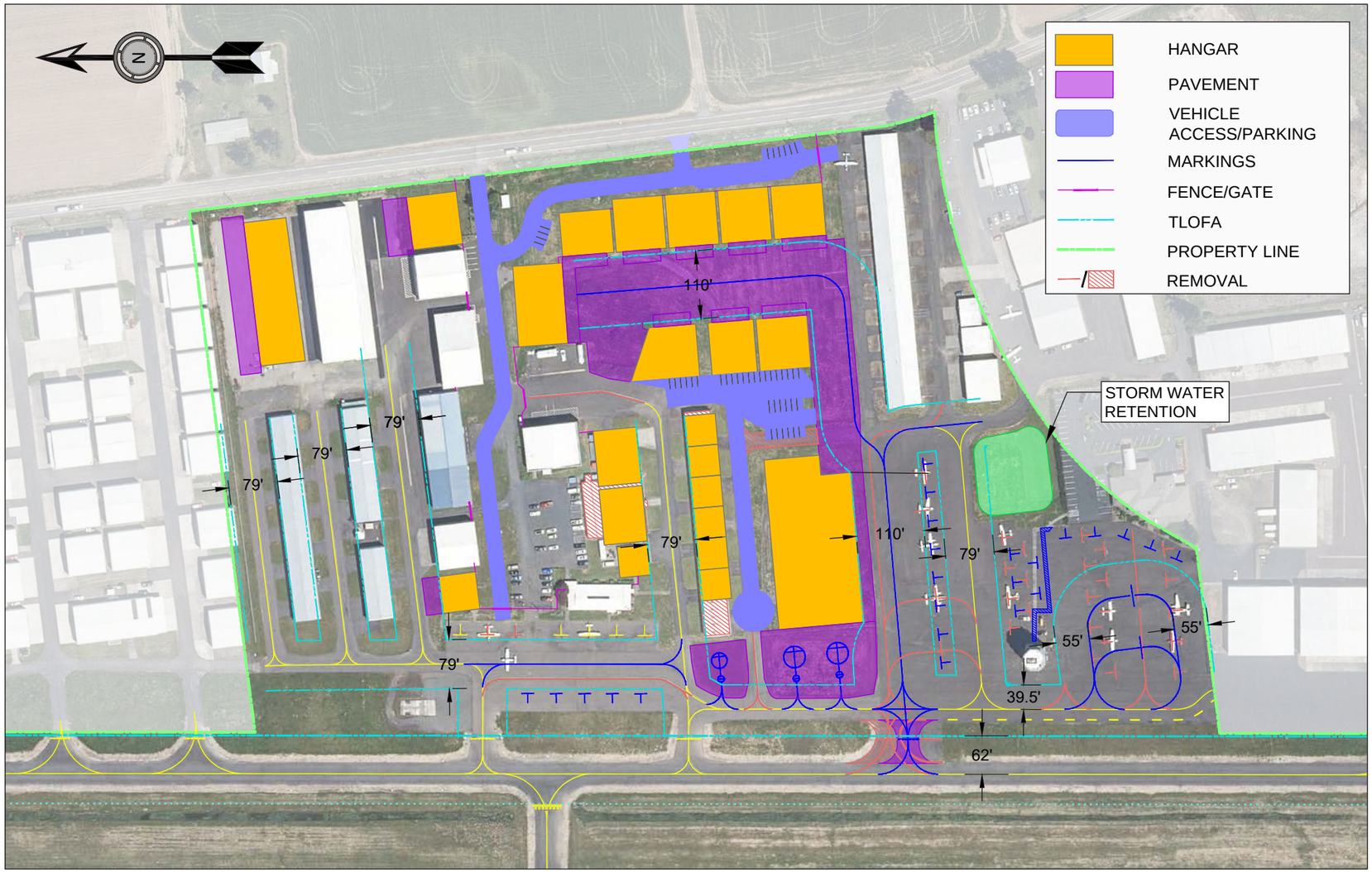


Commercial Hangar and FBO Development with Reconfigured Flight School Apron and Vehicle Service Road

Primary Components:

- Identical to Landside Alternative 1A with the following exceptions:
  - » A north/south VSR is proposed to provide dedicated vehicle access from the north boundary of the landside area to the south boundary of the landside area.
  - » The proposed five tiedowns west of Aurora Flight School, the three proposed helicopter parking positions, and six proposed tiedowns on the ATCT apron are omitted to create space for VSR.
  - » Two additional tiedowns are proposed west of the large FBO hangar, on the west side of the VSR.
  - » This configuration results in a net decrease of 13 tiedowns compared to the existing aircraft parking configuration.

FIGURE 5-13: PRELIMINARY LANDSIDE ALTERNATIVE 2



Commercial Hangar and FBO Development with In-fill Hangar Development

Primary Components:

- Commercial development with ADG II taxilane access, large FBO hangar, and vehicle access and parking.
- The apron adjacent to the ATCT is reconfigured to include two drive through large aircraft parking positions on the south end of the apron.
  - » Approximately three feet of the south edge of the TLOFA for the drive through parking encroaches upon private property to the south. Coordination with adjacent property owner and/or an easement may be necessary for development .
- Remaining ATCT apron is reconfigured to provide small aircraft tiedown parking with ADG I wingtip spacing.
- Realigned taxilane west of current Aurora Flight School facility to allow additional small aircraft tiedown parking.
- Proposed apron reconfiguration to meet FAA standards results in a net decrease of five tiedowns compared to the current aircraft parking configuration.
- Two large helicopter (35-foot rotor) parking positions and one small helicopter (25-foot rotor) parking positions are added.
- Storage building east of Aurora Flight School is removed to accommodate additional hangars on north side of existing ADG I hangar taxilane.
- One multi-unit T-hangar is replaced with small condo-style box hangars.
- Reconfigured fence and vehicle access road (outside the fence access provided to Aurora Flight School facility).
- Additional hangars infill is proposed for all available lots on the Airport.
- Approximately 154,000 square feet of additional hangar space is proposed.
- Storm water retention area is identified east of ATCT apron.

FIGURE 5-14: REMOVE DIRECT ACCESS – NORTH END

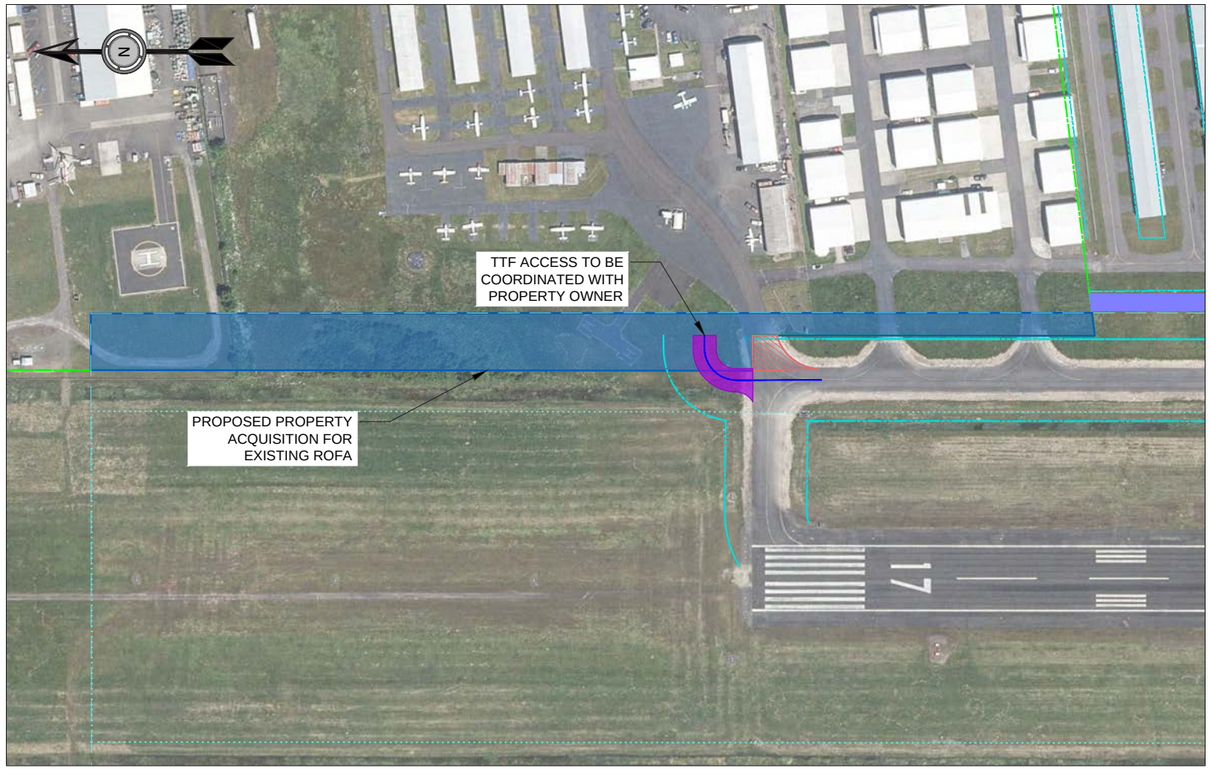


Figure 11 depicts a proposed reconfiguration of the existing TTF taxilane connection to Taxiway A1. The change in configuration would create a new taxi route between the adjacent apron and the runway, including a 90-degree turn to access Taxiway A and a second 90-degree turn to access Taxiway A1. This would eliminate the direct aircraft access configuration on Taxiway A1. The proposed changes require a new taxiway section and coordination with the adjacent private property owner. It is noted that a portion of this private property is also located in the ROFA for the existing Runway 17/35, which is recommended for property acquisition to meet FAA standards.

FIGURE 5-15: PARALLEL TAXIWAY ISLANDS – SOUTH END

Figure 12 depicts proposed painted islands in the large expanse of airfield pavement to differentiate the apron and parallel taxiway. Limiting the number of direct access points from adjacent aircraft aprons to parallel taxiways is consistent with FAA design guidance. Aircraft movement and hangar access on the apron would be consolidated for the existing TTF users. Longer-term improvements may replace the painted markings with pavement removal as part of a major taxiway reconstruction project that may require additional stormwater drainage improvements.

REFINED PRELIMINARY ALTERNATIVES – AIRSIDE

As previously discussed, of the seven preliminary airside alternatives presented in PAC meeting #6, three concepts (Preliminary Airside Alternatives 5 through 7) were removed from consideration based on the FAA input received prior to the meeting.

Through the coordination process, FAA provided clear and consistent guidance that maintaining the current non-standard conditions is not an acceptable path forward. The FAA requires airfield facilities planning to mirror forecast demand and adhere to design standards identified through the facility requirement analysis. In instances where progress towards meeting these design standards is incomplete, the runway may be relegated to maintenance-only mode by the FAA until significant advancements are made. A failure to make measurable progress could put future FAA funding at risk.

With the provided FAA guidance in mind, refined preliminary airside alternatives were developed to include modifications to address specific review comments provided by the FAA, members of the PAC, airport users, and the public. Several assumptions were made to the proposed airside and landside refined alternatives including:

- The South Runway Extension Option has been eliminated due to its substantial impacts on Exclusive Farm Use (EFU)-zoned land.
- All airside alternatives will include a parallel taxilane adjacent to the east parallel taxiway to facilitate aircraft movement and provide access from landside facilities to the taxiway.
- A Vehicle Service Road will be established along the frontage of the east landside areas.
- Regarding land acquisition, the East Side Property Acquisition strategy has been outlined, where lands currently in aeronautical use in the vicinity of Aurora State Airport are designated for future acquisition to ensure their continued long-term aeronautical utility
  - » This acquisition strategy is multifaceted, including several land parcels required to meet FAA design standards and airfield clearances, which vary by alternative. Additionally, other parcels would be identified on the Airport Layout Plan (ALP) to make their purchase eligible for FAA funding.
- For all airside alternatives, the existing Oregon Department of Transportation (ODOT) Hubbard Highway Right-of-Way (ROW) width of approximately 200 feet will be preserved. This will increase the impacts to adjacent non-aeronautical properties in the “highway shift” alternatives to account for the uniform ODOT ROW.

Refined Preliminary Airside Alternative 1A (Figure 5-16) builds upon Preliminary Airside Alternative 1 by extending the runway and parallel taxiway 497 feet north on the current alignment. A full-length parallel taxilane and VSR was added to the east side of Taxiway A to address direct runway access and V/PD issues and improve aircraft movement efficiency. The parallel taxilane would accommodate ADG II aircraft from the main apron south. The parallel taxilane would be limited to ADG I aircraft north of the main apron as the aircraft stored in these areas are primarily small ADG I aircraft

On the west side of the property, Hubbard Highway and right-of-way are realigned approximately 85 feet west to clear the ROFA. The relocation of the highway right-of-way impacts 13 residential properties and four commercial properties.

Two existing septic drain fields located in the existing and future ROFAs are to either be improved to meet FAA surface gradient and weight-bearing standards, or removed.

Figure 5-17 gives a detailed view of the shift of Hubbard Highway and the impact to properties on the west side of the highway as depicted in Refined Airside Alternative 1A.

Figure 5-18 depicts the property acquisition proposed in Refined Preliminary Airside Alternative 1A.

Refined Preliminary Airside Alternative 1B **(Figure 5-19)** also builds upon Preliminary Airside Alternative 1 by extending the runway and parallel taxiway 497 feet north. However, this concept realigns the runway and parallel taxiway approximately 80 feet west to allow the addition of a parallel taxilane and VSR without impacting the aeronautical facilities and properties on the west side of the airport property.

The westerly shift of the runway and taxiway requires shifting Hubbard Highway and right-of-way 175 west to clear the ROFA, impacting 20 residential properties and 4 commercial properties.

The two previously mentioned septic drain fields located in the existing and future ROFAs are either to be improved to meet grading and weight-bearing standards or removed from the RSA.

Figure 5-20 gives a detailed view of the shift of Hubbard Highway and the impact to properties on the west side of the highway as depicted in Refined Airside Alternative 1B.

Figure 5-21 depicts the property acquisition proposed in Refined Preliminary Airside Alternative 1B.

Refined Preliminary Airside Alternative 2 **(Figure 5-22)** takes a similar approach to clearing the ROFA as Refined Preliminary Airside Alternative 1B but applies it in the opposite direction. In this alternative the runway and taxiway are extended 497 feet north but shifted 85 east to clear the conflict between the ROFA and Hubbard Highway without impacting neighboring properties west of the airport property. The parallel taxilane and VSR are again included on the east side of Taxiway A. This concept places greater impacts on east side aeronautical properties and facilities (State-owned and privately-owned TTF) to avoid impacts on Hubbard Highway and non-aeronautical residential and commercial properties on the west side.

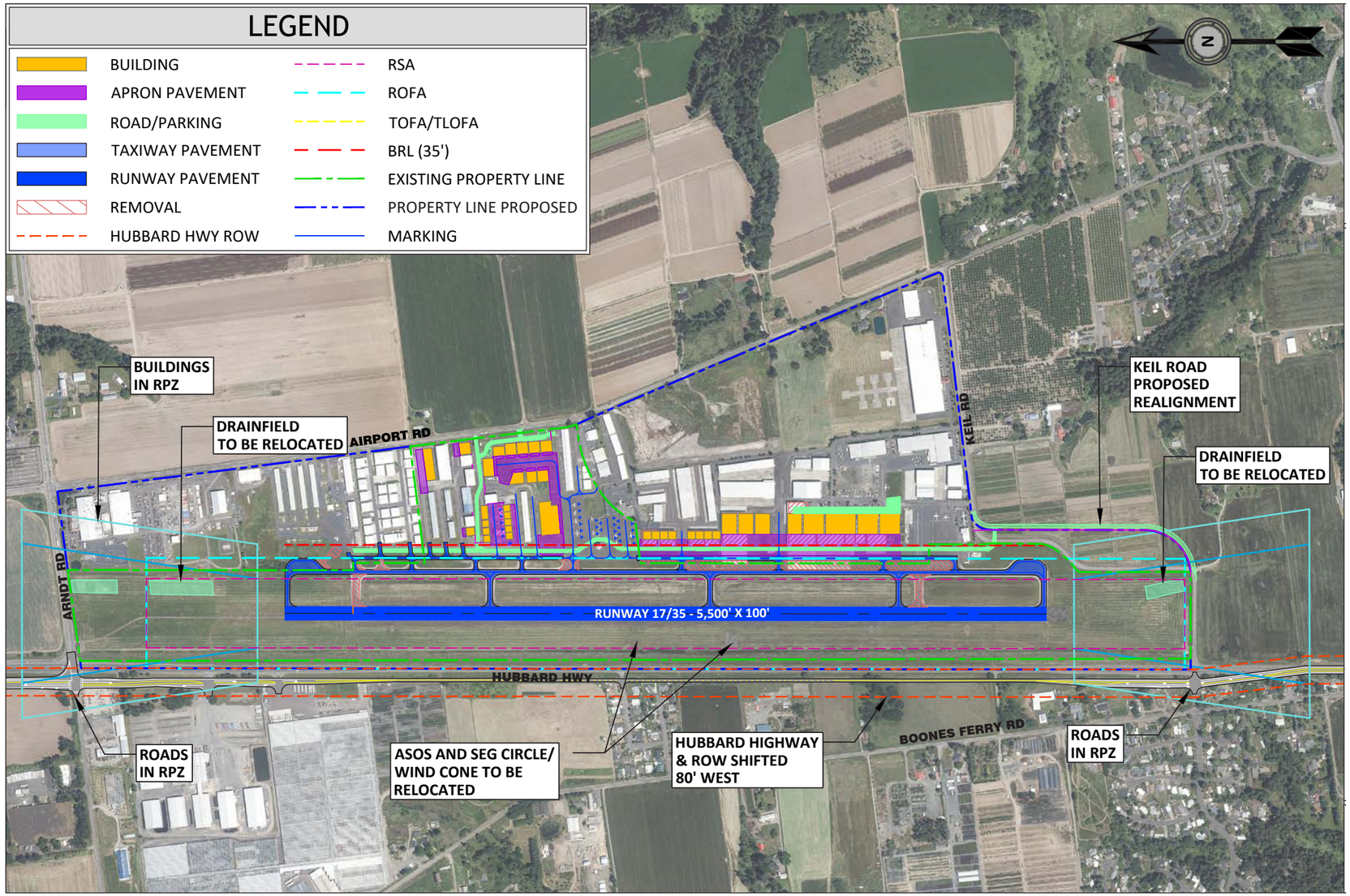
As was the case in the previous refined preliminary alternatives, the two septic drain fields located in the existing and future ROFAs would either be improved to meet FAA surface gradient and weight-bearing standards, or removed.

Figure 5-23 depicts the property acquisition proposed in Refined Preliminary Airside Alternative 2.

FIGURE 5-16: REFINED PRELIMINARY AIRSIDE ALTERNATIVE 1A

REFINED ALTERNATIVE 1A

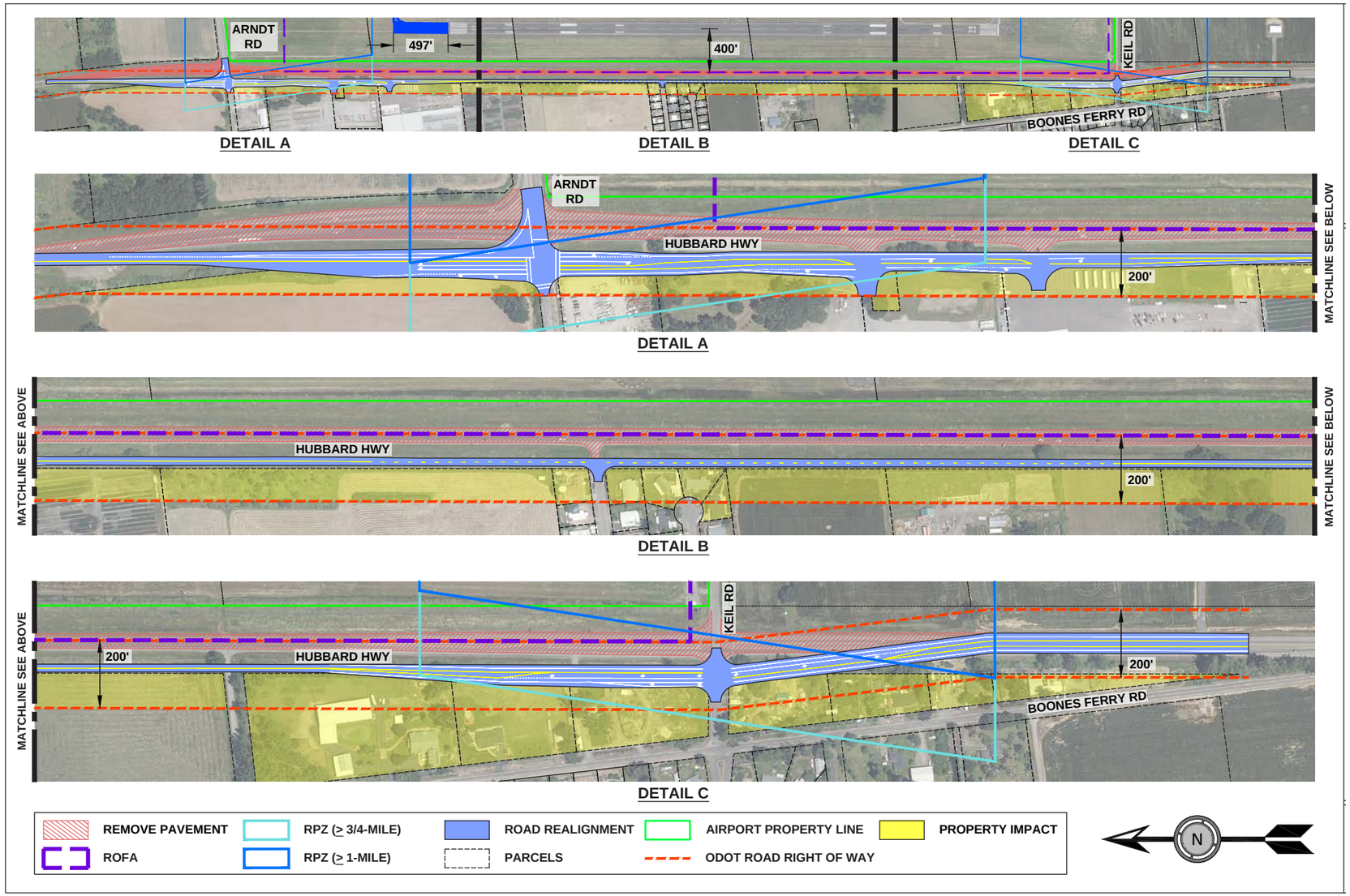
Shift Hubbard Highway West and Extend Runway North to 5,500 feet
OVERVIEW



- Builds upon Preliminary Alternative 1
- Shifts Hubbard Highway and right-of way approximately 80 feet west to clear ROFA
- Extends Runway 497 feet north to a total length of 5,500 feet
- Includes a full length parallel taxilane and vehicle service road east of Taxiway A to address direct runway access and V/PD issues
- Identifies 43 acres of property acquisition to facilitate shifting Hubbard Highway and the construction of parallel taxilane and vehicle service road
  - » Highway shift impacts 13 residential properties and 4 commercial properties west of Hubbard Highway
- Identifies 114 acres to be purchased as aeronautical reserve if available
- South apron aeronautical properties are acquired, and hangars removed to accommodate parallel taxilane and vehicle service road
  - » 237,000 square feet of existing hangars space removed
- New hangars constructed along south apron at appropriate setback from parallel taxilane and vehicle service road
  - » 195,000 square feet of new hangar space
- North landside area redesigned to accommodate parallel taxilane and vehicle service road
  - » 149,000 square feet of new hangar space
  - » 29 small aircraft tiedowns
  - » No helicopter parking
  - » No large aircraft pull-through parking positions
  - » Accommodates existing ATCT location
- Reroutes Keil Road to clear ROFA and TOFA
- ASOS, segmented circle/windsock in the ROFA, and drain fields in the RSA to be relocated pending further study

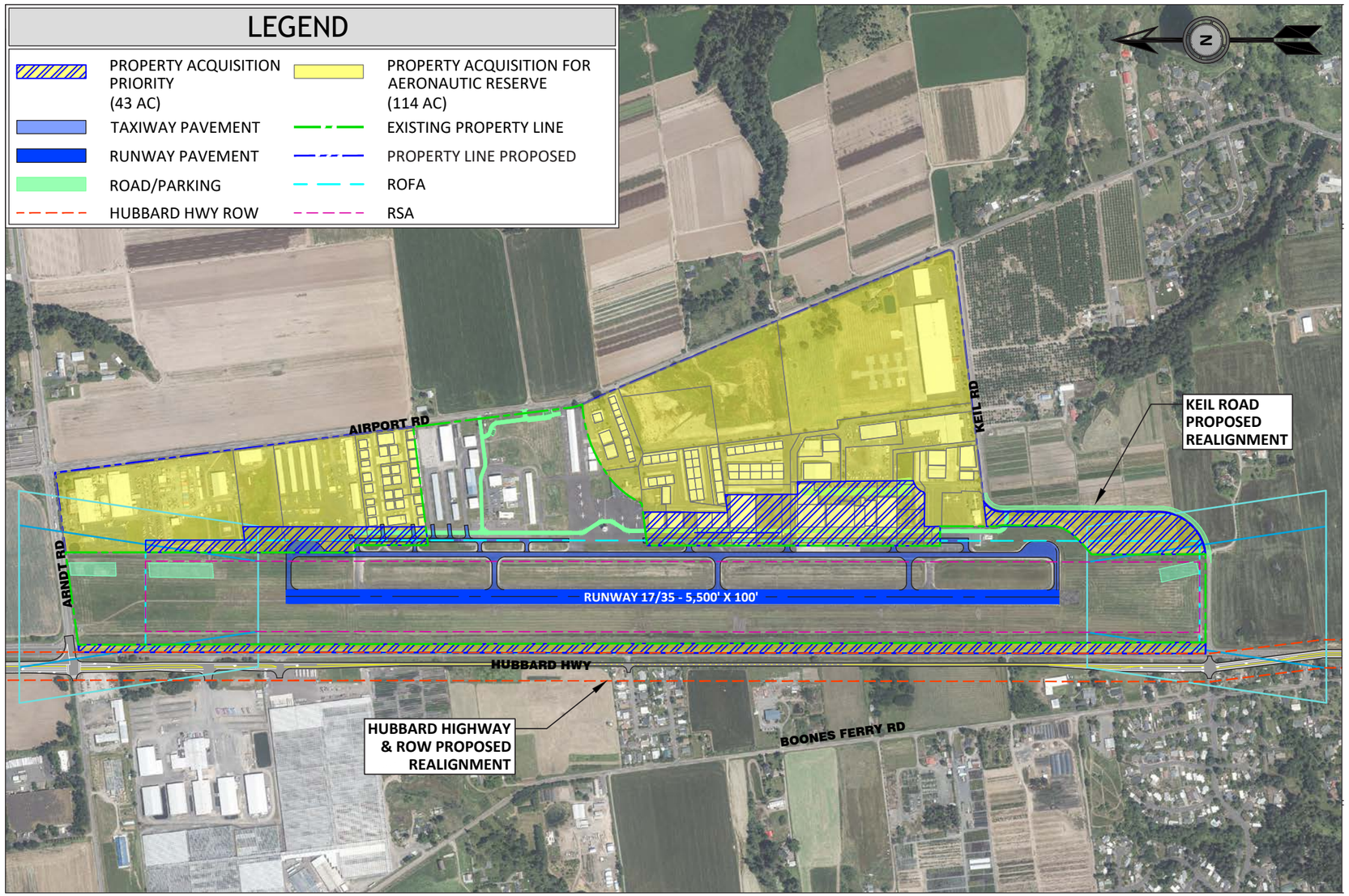
REFINED ALTERNATIVE 1A

Shift Hubbard Highway West and Extend Runway North to 5,500 feet
HIGHWAY DETAIL



REFINED ALTERNATIVE 1A

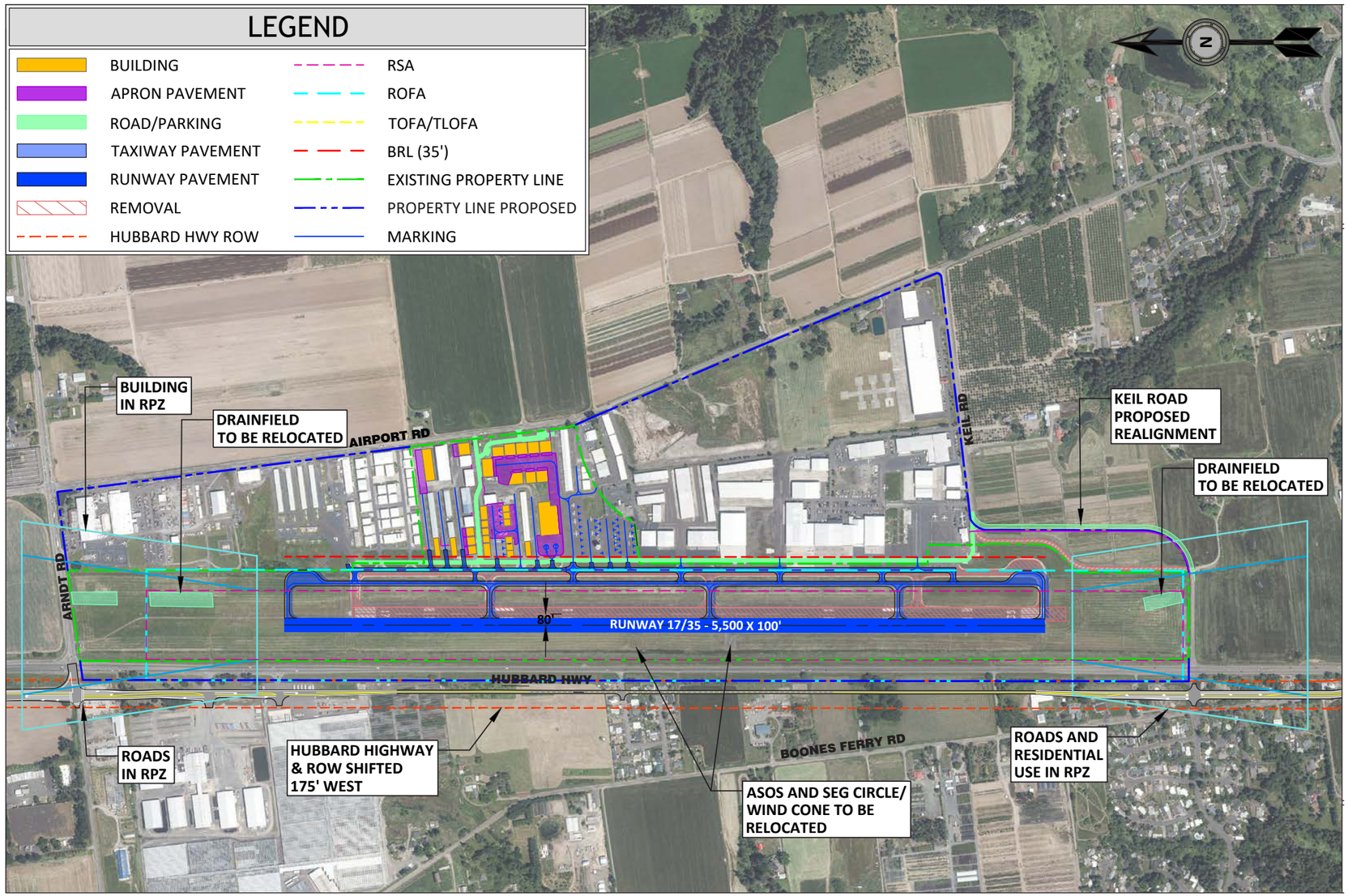
Shift Hubbard Highway West and Extend Runway North to 5,500 feet
PROPERTY OVERVIEW



REFINED ALTERNATIVE 1B

Shift Runway and Hubbard Highway West and Extend Runway North to 5,500 feet

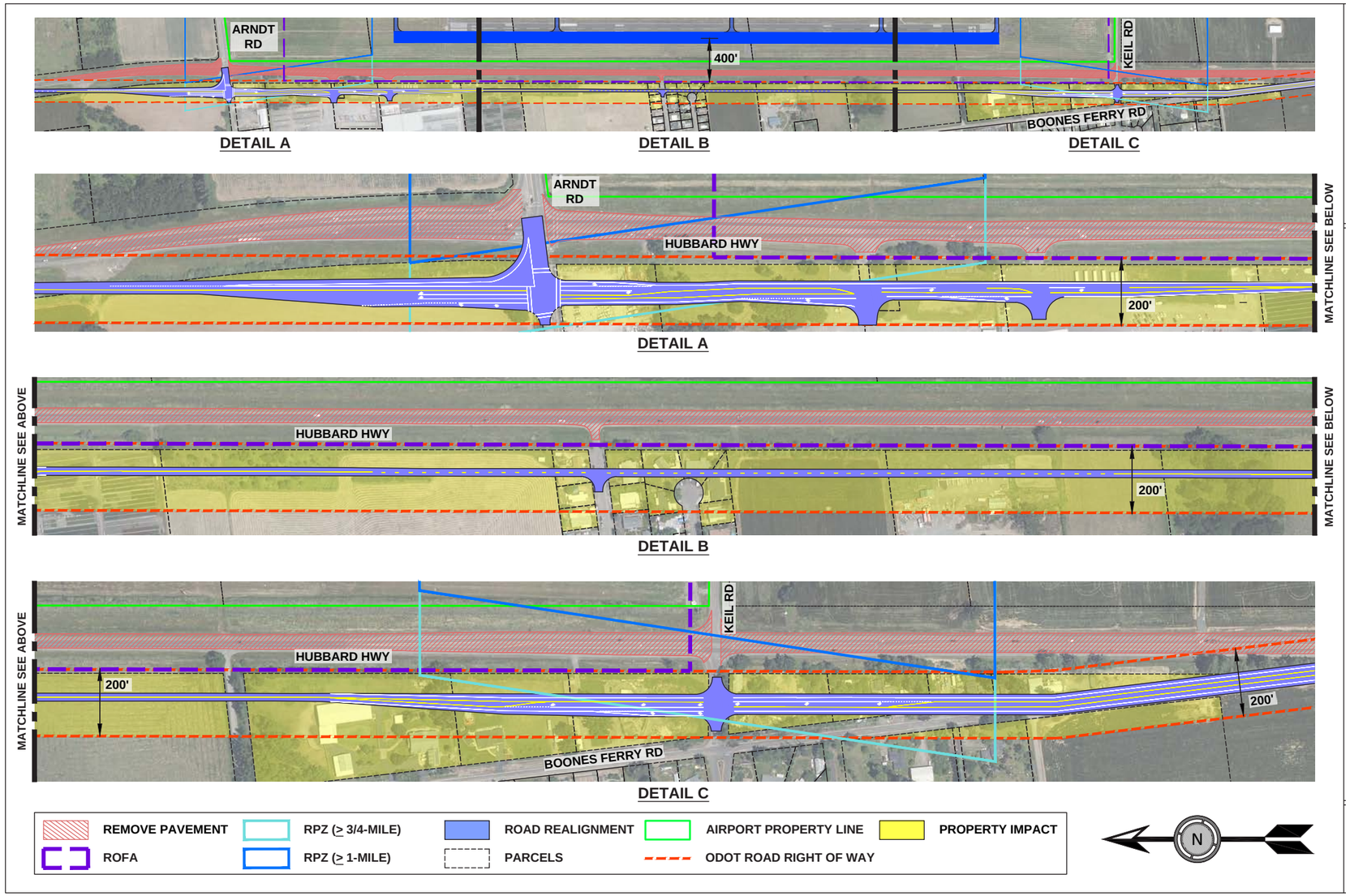
OVERVIEW



- Builds upon Preliminary Alternative 1
- Shifts Runway approximately 80 feet west to accommodate parallel taxilane and vehicle service road on east side
- Shifts Hubbard Highway and right-of way approximately 175 feet west to clear ROFA
- Extends Runway 497 feet north to a total length of 5,500 feet
- Includes a full length parallel taxilane and vehicle service road west of Taxiway A to address direct runway access and V/PD issues
- Identifies 39 acres of property acquisition to facilitate shifting Hubbard Highway and the construction of parallel taxilane and vehicle service
  - » Highway shift impacts 20 residential properties and 4 commercial properties west of Hubbard Highway
  - » No aeronautical structures are impacted
- Identifies 133 acres to be purchased as aeronautical reserve if available
- North landside area redesigned to accommodate parallel taxilane and vehicle service road
  - » 178,000 square feet of new hangar space
  - » 36 small aircraft tiedowns
  - » 2 helicopter parking positions
  - » No large aircraft pull-through parking positions
  - » Accommodates existing ATCT location
- Reroutes Keil Road to clear ROFA and TOFA
- ASOS, segmented circle/windsock in the ROFA, and drain fields in the RSA to be relocated pending further study

REFINED ALTERNATIVE 1B

Shift Runway and Hubbard Highway West and Extend Runway North to 5,500 feet
HIGHWAY DETAIL



REFINED ALTERNATIVE 1B

Shift Runway and Hubbard Highway West and Extend Runway North to 5,500 feet
PROPERTY OVERVIEW

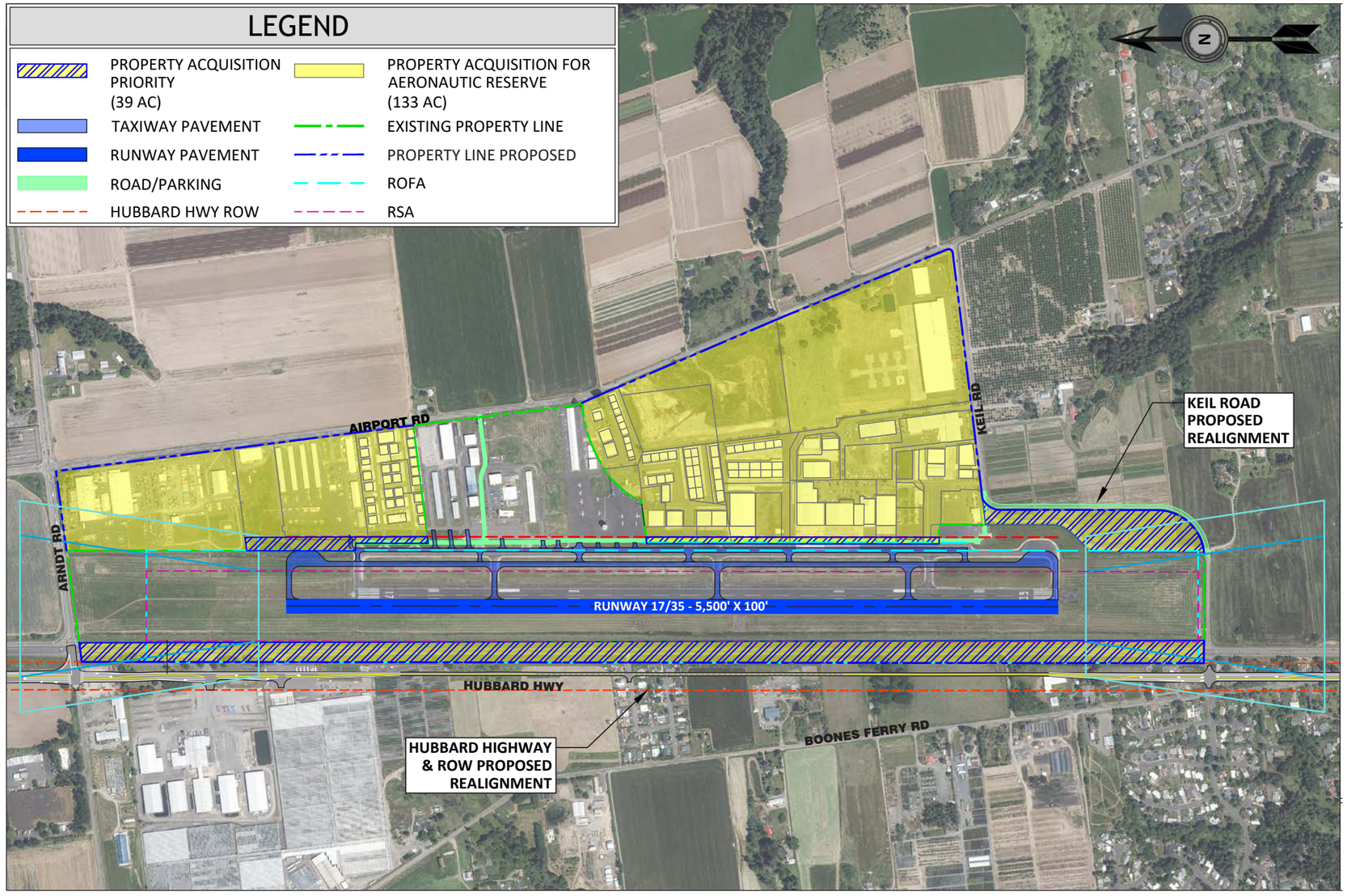
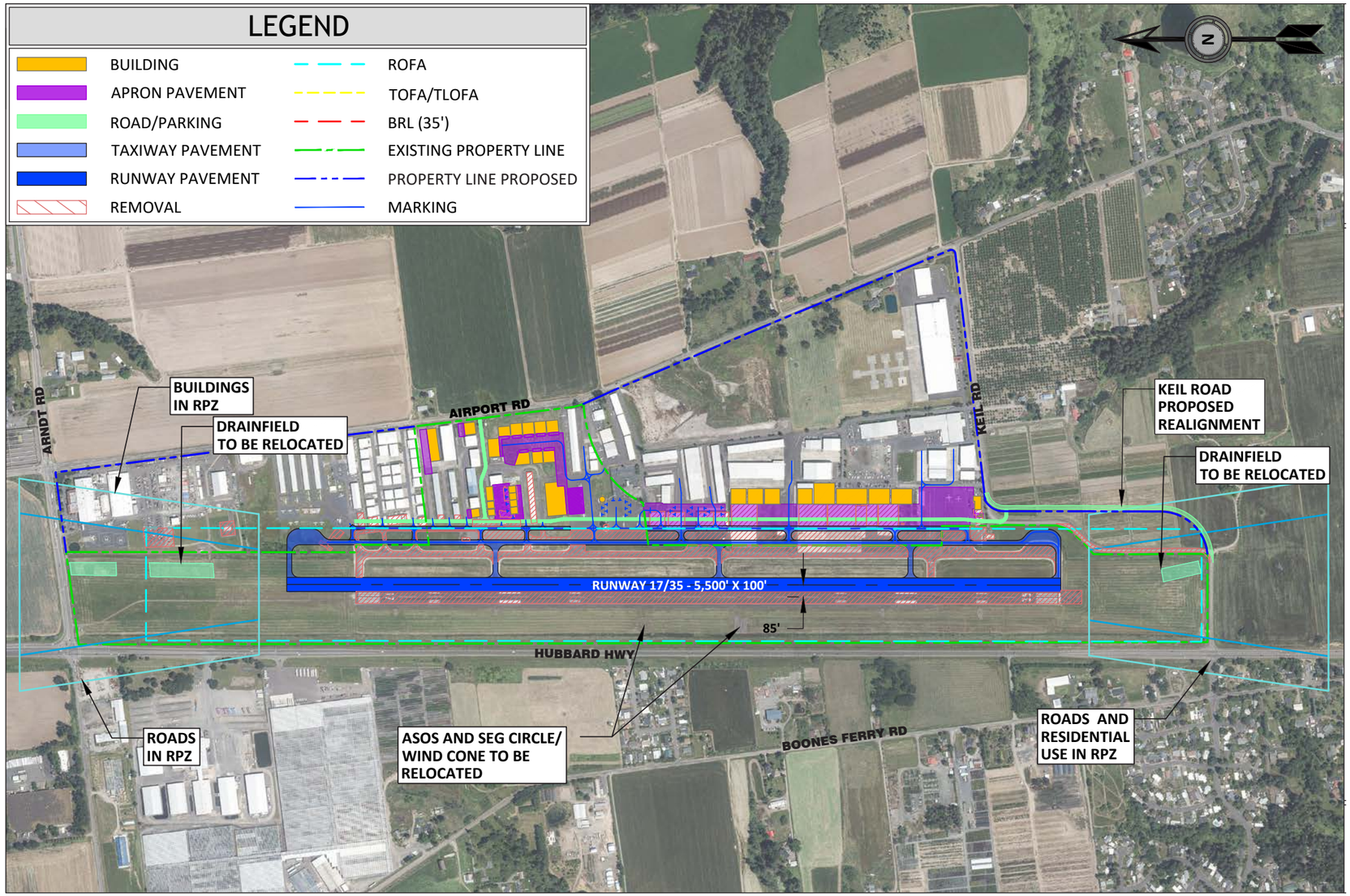


FIGURE 5-22:
REFINED PRELIMINARY AIRSIDE ALTERNATIVE 2

REFINED ALTERNATIVE 2

Shift Runway East and Extend North to 5,500 feet
OVERVIEW

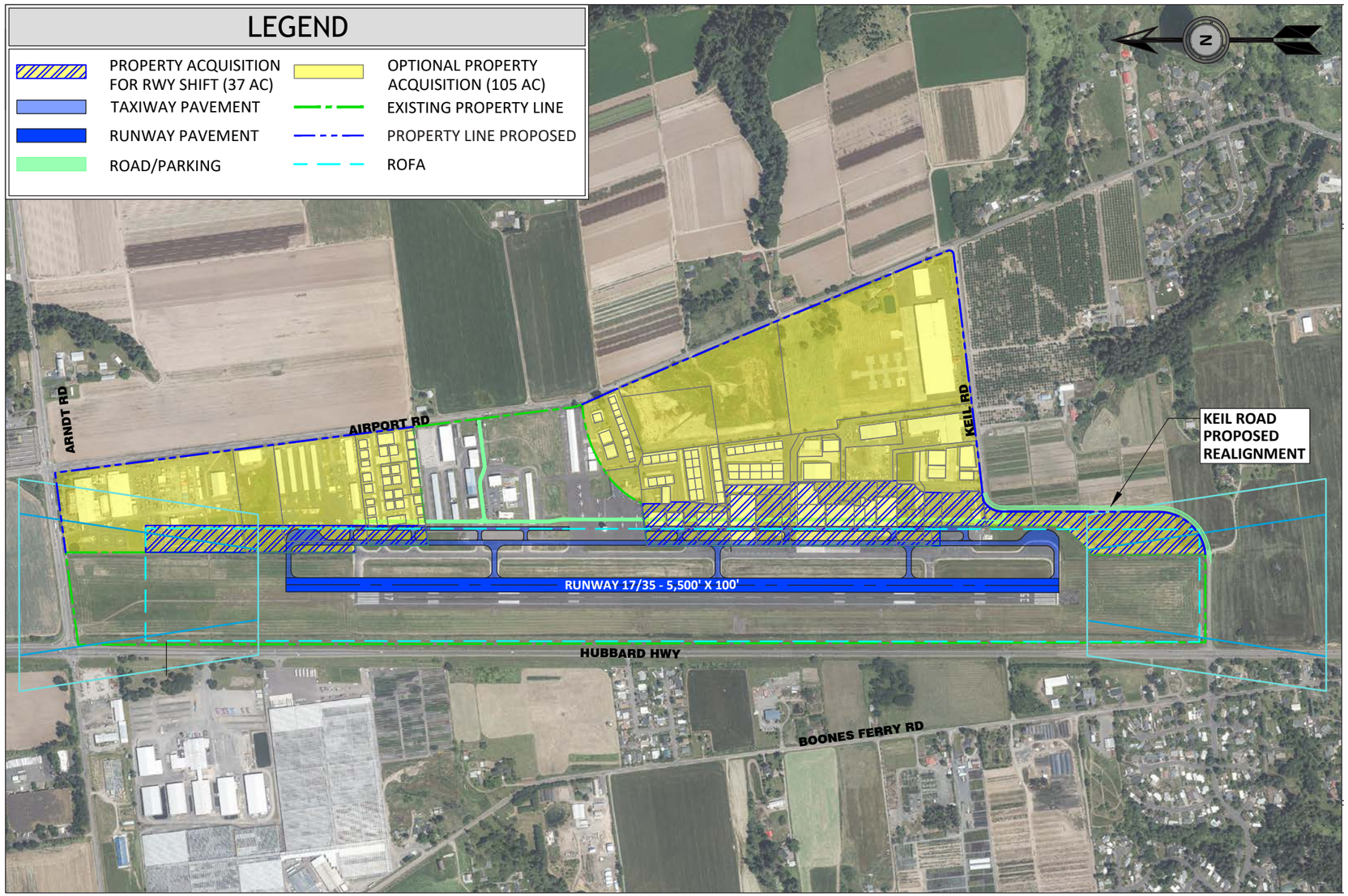


- Builds upon Preliminary Alternative 2
- Hubbard Highway remains on the current alignment
- Runway is shifted 85 feet east to clear the ROFA
- Extends Runway 497 feet north to a total length of 5,500 feet
- Includes a full length parallel taxilane and vehicle service road west of Taxiway A to address direct runway access and V/PD issues
- Identifies 37 acres of property acquisition to facilitate shifting the runway and the construction of parallel taxilane and vehicle service
  - » No properties west of Hubbard Highway are impacted
- Identifies 105 acres to be purchased as aeronautical reserve if available
- South apron aeronautical properties are acquired, and hangars removed to accommodate shifted runway, parallel taxilane and vehicle service road
  - » 242,000 square feet of existing hangars space removed
    - – Includes 5,000 square foot FBO building
- New hangars constructed along south apron at appropriate setback from parallel taxilane and vehicle service road
  - » 142,000 square feet of new hangar space
    - – Includes 5,000 square foot FBO building
- North landside area redesigned to accommodate parallel taxilane and vehicle service road
  - » 35,000 square feet of existing hangar space is removed
  - » 143,000 square feet of new hangar space
  - » 27 small aircraft tiedowns
  - » No helicopter parking
  - » 1 large aircraft pull-through parking positions
  - » ATCT to be relocated pending further study
- Reroutes Keil Road to clear ROFA and TOFA
- ASOS, segmented circle/windsock in the ROFA, and drain fields in the RSA to be relocated pending further study

FIGURE 5-23:
REFINED PRELIMINARY AIRSIDE ALTERNATIVE 2 PROPERTY ACQUISITION

REFINED ALTERNATIVE 2

Shift Runway East and Extend North to 5,500 feet
PROPERTY OVERVIEW



REFINED PRELIMINARY ALTERNATIVES – LANDSIDE

The three refined preliminary landside alternatives presented below build upon Preliminary Landside Alternative 1A. The facilities located on the west side of the landside development areas have slight differences based on available space resulting from the different alignments of the runway/taxiway systems proposed in each of the previously discussed refined preliminary alternatives. The north and south landside areas are presented separately for clarity.

Refined Preliminary Landside Alternative 1A is paired with Refined Preliminary Airside Alternative 1A. The north landside area **(Figure 5-24)** is centered on commercial hangar development with ADG II taxilane access, large FBO hangar, apron lease area, and vehicle access and parking. The existing flight school apron and hangar area is reconfigured to provide additional hangar storage and tiedown parking. The flight school offices and classroom space would be accommodated in a new structure located on the northeast corner of the proposed apron. This concept accommodates the existing ATCT in its current location but sacrifices small aircraft tiedown parking on the main apron to make space for the VSR.

The south landside area **(Figure 5-25)** is significantly impacted by the addition of the parallel taxilane and VSR which make it necessary to acquire TTF properties in the South TTF apron fronting Taxiway A. Approximately 237,000 square feet of hangars space on those properties is proposed to be removed and 195,000 square feet of new hangar space would be constructed to the east to accommodate standard clearances for the taxilane and VSR. All new hangars constructed are limited to a height of 45 feet.

Refined Preliminary Landside Alternative 1B corresponds to Refined Preliminary Airside Alternative 1B. The north landside area **(Figure 5-26)** is again centered on commercial hangar development with ADG II taxilane access, large FBO hangar, apron lease area, and vehicle access and parking. The existing flight school apron and hangar area is reconfigured to provide additional hangar storage and tiedown parking in a similar fashion to Refined Preliminary Landside Alternative 1A. Due to the westward shift of the runway/taxiway system, additional space is available to accommodate the parallel taxilane and VSR allowing for the inclusion additional hangar storage, helicopter parking positions, and small aircraft tiedown parking positions. The ATCT is not impacted by this concept.

The south landside area **(Figure 5-27)** is primarily impacted by a reduction of apron space along the hangar frontage. No hangars are identified for removal in this concept.

Refined Preliminary Landside Alternative 2 is similar to Refined Preliminary Airside Alternative 1A, as aeronautical properties on the east side of the runway are impacted to accommodate the parallel taxilane and VSR. Since the runway is shifted east in this concept, the impacts are greater than those depicted in 1A. The north landside area **(Figure 5-28)** is impacted by the removal of 35,000 square feet of existing hangar space. An additional 143,000 square feet of hangar space is added through construction of the previously discussed commercial hangar development area and in-fill hangar development. Also, as available apron space is taken up by the taxilane and VSR small aircraft parking capacity is decreased to 22 positions and large aircraft pull through parking is limited to one position. Finally, the ATCT would have to be relocated in this scenario.

Much like in Refined Preliminary Landside Alternative 1A, the south landside area **(Figure 5-29)** is significantly impacted by the addition of the parallel taxilane and VSR which make it necessary to acquire TTF properties in the South TTF apron fronting Taxiway A. However, in this case the runway and taxiway system are shifted farther east to eliminate impacts to Hubbard Highway and adjacent residential and commercial properties. The greater shift of the runway/taxiway system would necessitate the acquisition and removal of 242,000 square feet of existing hangars and FBO space, which would be replaced by 142,000 square feet of new hangar and FBO space.

FIGURE 5-24: REFINED PRELIMINARY LANDSIDE ALTERNATIVE 1A – NORTH

REFINED ALTERNATIVE 1A

Shift Hubbard Highway West and Extend Runway North to 5,500 feet
LANDSIDE NORTH

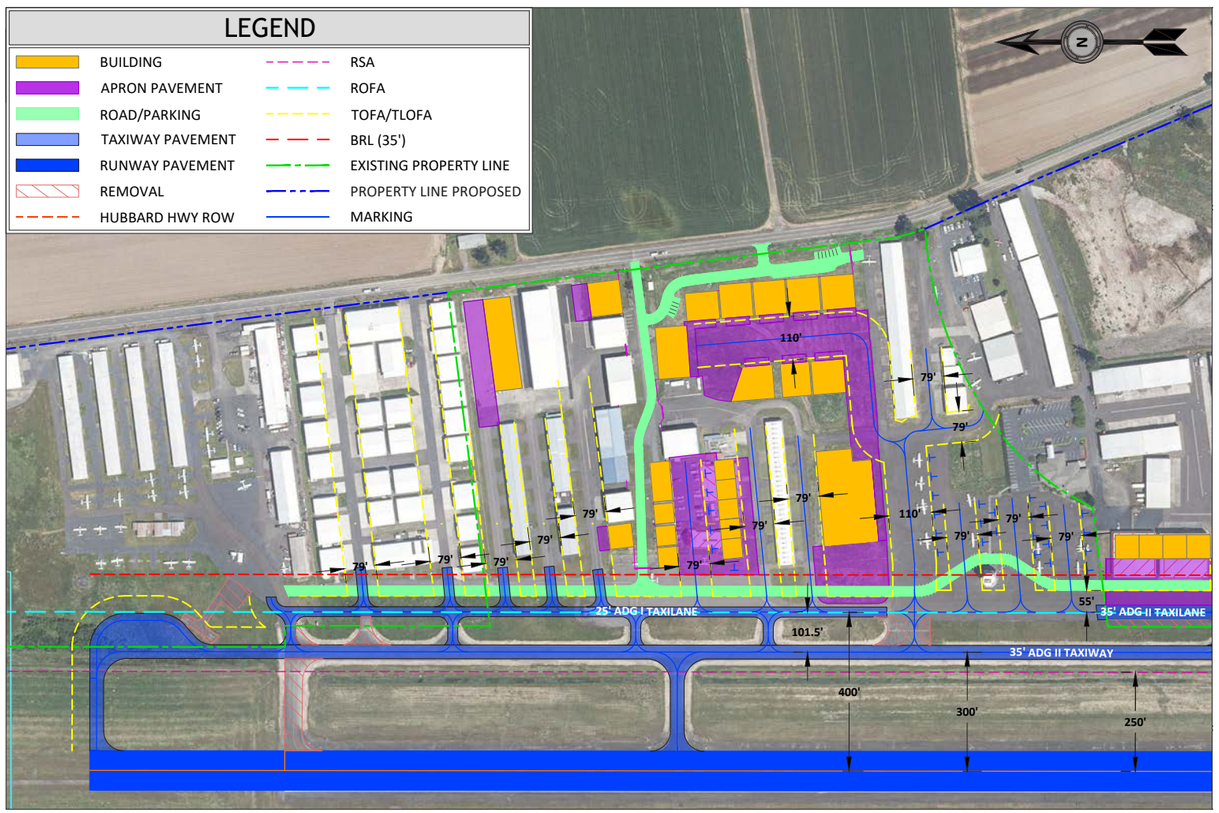


FIGURE 5-25: REFINED PRELIMINARY LANDSIDE ALTERNATIVE 1A – SOUTH

REFINED ALTERNATIVE 1A

Shift Hubbard Highway West and Extend Runway North to 5,500 feet
LANDSIDE SOUTH

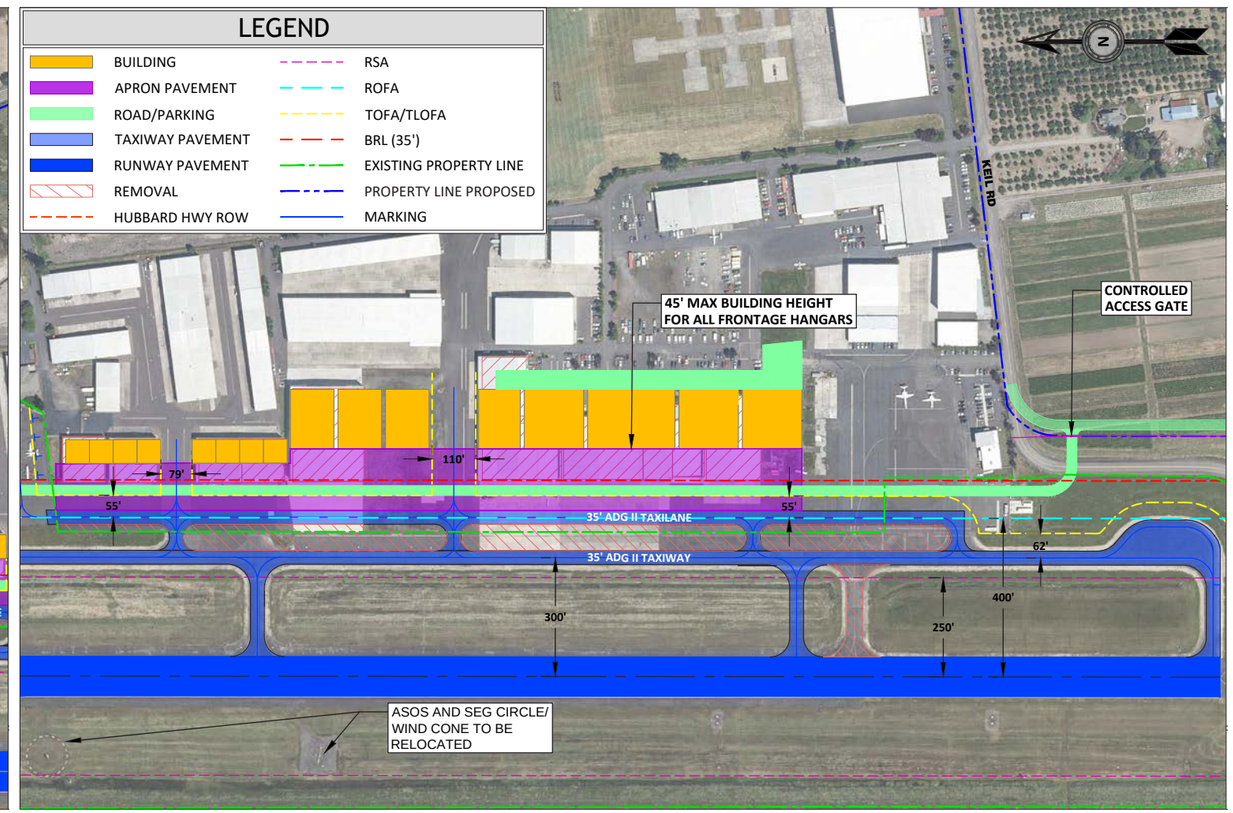


FIGURE 5-26: REFINED PRELIMINARY LANDSIDE ALTERNATIVE 1B – NORTH

REFINED ALTERNATIVE 1B

Shift Runway and Hubbard Highway West and Extend Runway North to 5,500 feet LANDSIDE NORTH

FIGURE 5-27: REFINED PRELIMINARY LANDSIDE ALTERNATIVE 1B – SOUTH

REFINED ALTERNATIVE 1B

Shift Runway and Hubbard Highway West and Extend Runway North to 5,500 feet LANDSIDE SOUTH

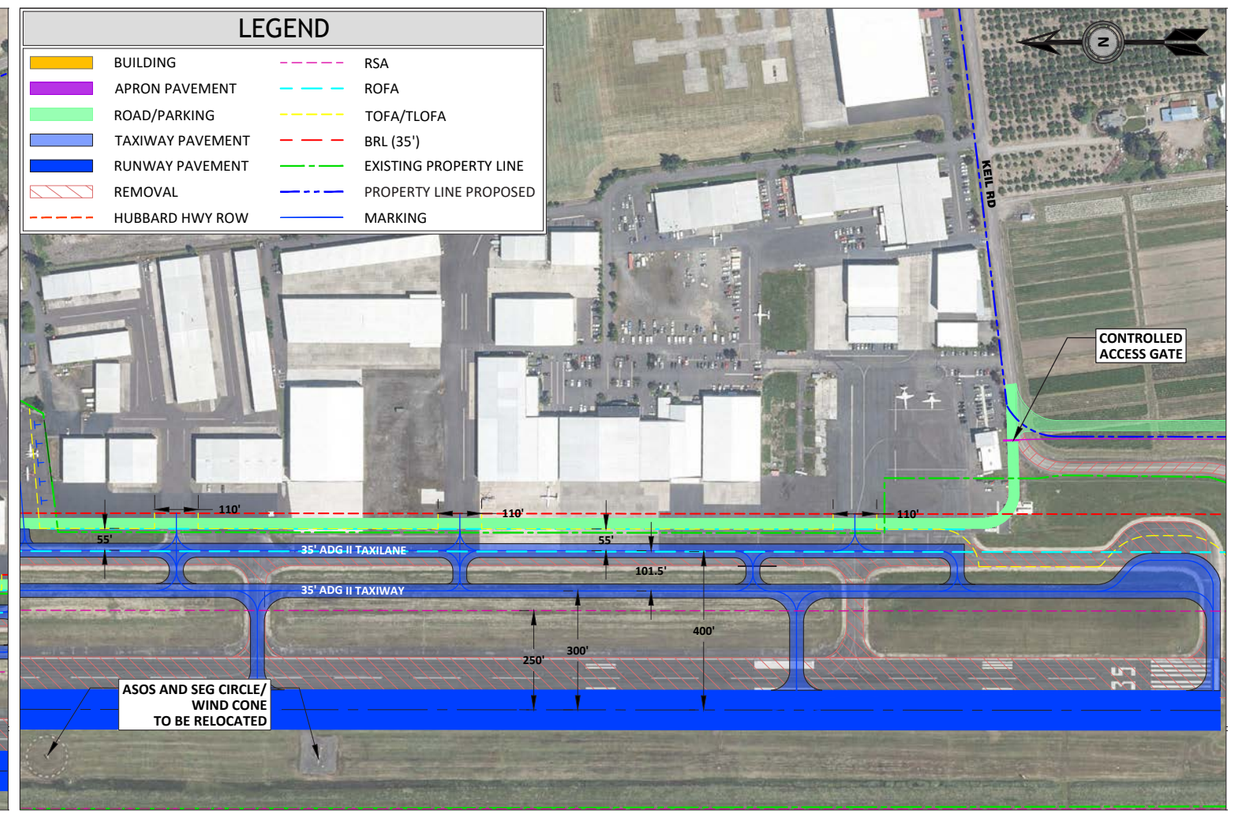


FIGURE 5-28: REFINED PRELIMINARY LANDSIDE ALTERNATIVE 2 – NORTH

REFINED ALTERNATIVE 2

Shift Runway East and Extend North to 5,500 feet
LANDSIDE NORTH

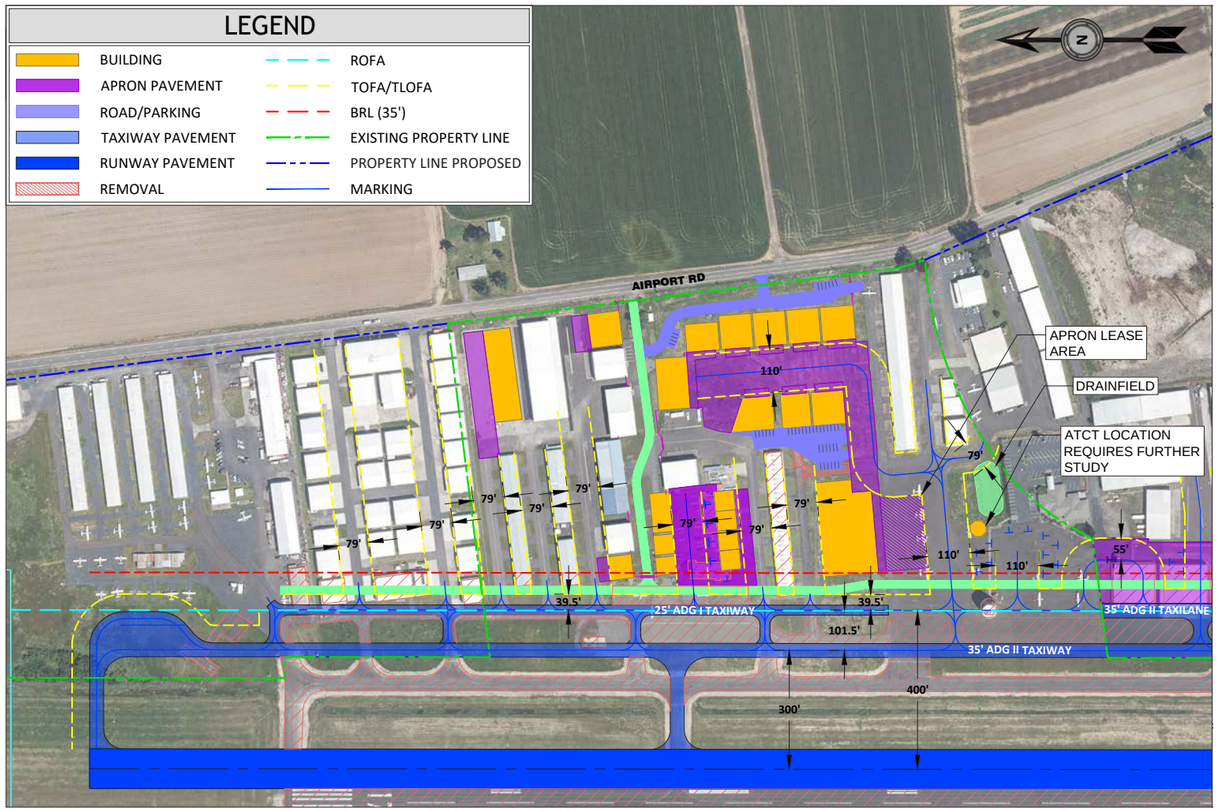
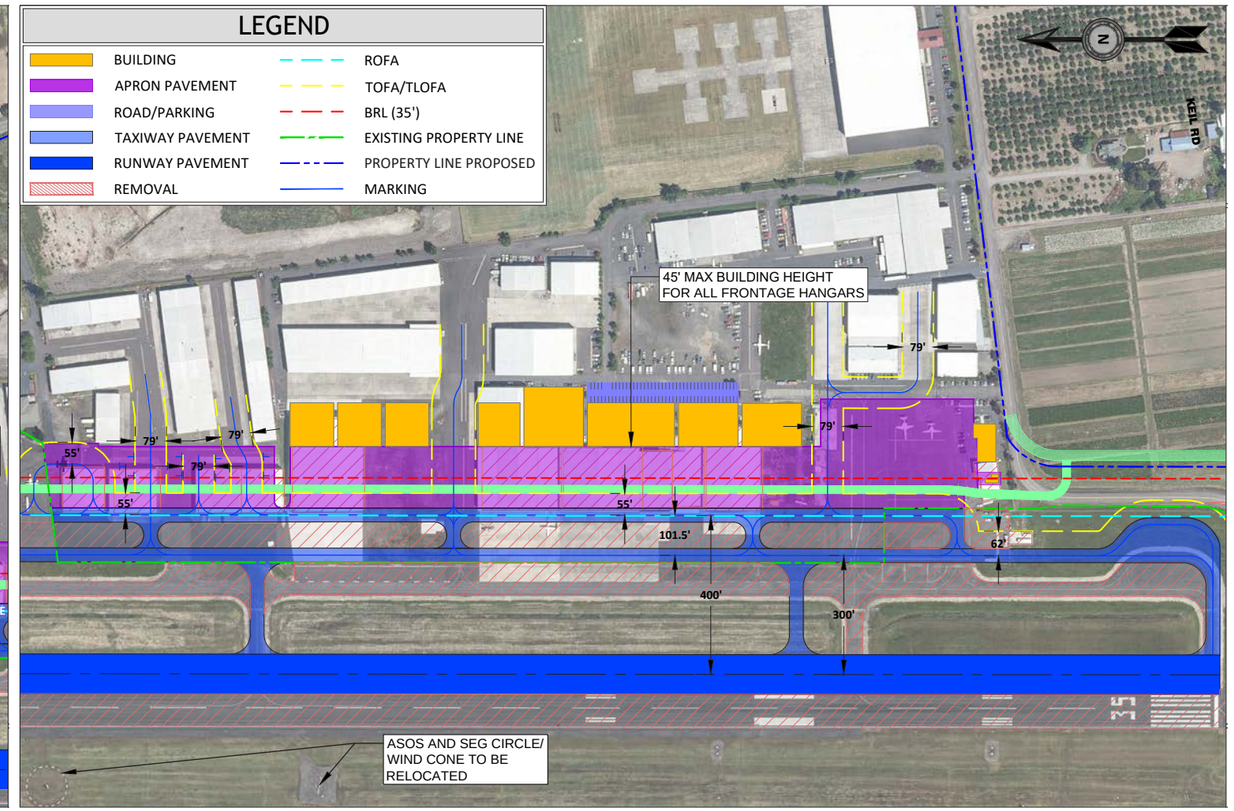


FIGURE 5-29: REFINED PRELIMINARY LANDSIDE ALTERNATIVE 2 – SOUTH

REFINED ALTERNATIVE 2

Shift Runway East and Extend North to 5,500 feet
LANDSIDE SOUTH



Preliminary Cost Estimates

Preliminary cost comparisons of the Refined Preliminary Alternatives (1A, 1B, and 2) were prepared based on engineering/design of environmental and construction elements, as well as best available public information on property values. The preliminary estimates are summarized in **Tables 5-1 through 5-3**.

TABLE 5-1: COST ESTIMATE – ALTERNATIVE 1A - SHIFT HIGHWAY WEST

CENTURY WEST ENGINEERING

OREGON DEPARTMENT OF AVIATION

AURORA STATE AIRPORT
MASTER PLAN UPDATE - COST ESTIMATES
DRAFT

ALTERNATIVES 1A, 1B AND 2 SUMMARY

October 15, 2024

No.	Project Description	Estimated Cost
ALTERNATIVE 1A - SHIFT HIGHWAY WEST		
1	Realign Hubbard Highway	$ 33,271,000.00
2	Septic Drainfield Removal in ROFA By Others (Drainfields: Keil Rd, Columbia, & Wylee)	$ 1,407,000.00
3	Fill Taxiway Drainage Ditch	$ 3,603,000.00
4	Relocate AWOS, Windcone, and Segmented Circle	$ 1,726,000.00
5	Realign Keil Road	$ 3,162,000.00
6	Property Acquisition - Southeast Side Aeronautic Parcels - Phase I*	$ 3,966,000.00
7	Property Acquisition - Southeast Side Aeronautic Parcels - Phase II*	$ 61,087,000.00
8	Property Acquisition - Northeast Side Aeronautic Parcels*	$ 6,475,000.00
9	Property Acquisition - West Side Hubbard Highway*	$ 16,582,000.00
10	Property Acquisition - Keil Road Realignment*	$ 1,184,000.00
11	Construct Vehicle Service Road	$ 2,638,000.00
12	Septic Drainfield Removal By Others (TEC Equipment)	$ 345,000.00
13	Runway 17 RPZ Clearance	$ 3,087,000.00
14	Extend Runway/ Extend Taxiway A	$ 7,060,000.00
15	Reconstruct ADG II Parallel Taxilane and Connectors (Taxilane South of Main Apron)	$ 6,485,000.00
16	Reconstruct ADG I Parallel Taxilane and Connectors (Taxilane North of Main Apron)	$ 4,802,000.00
17	Remove Existing Hangars in Flight School Area	$ 1,309,000.00
18	Construct New Flight School Apron	$ 2,651,000.00
19	Rehablitate and Reconfigure Main Apron Taxilanes and Tie Downs	$ 821,000.00
20	Remove Existing Hangars on South Hangar Area	$ 12,781,000.00
21	Construct South Apron	$ 11,125,000.00
	ALTERNATIVE 1A - SHIFT HIGHWAY WEST	**$ 185,566,000.00**

TABLE 5-2: COST ESTIMATE – ALTERNATIVE 1B - SHIFT HIGHWAY AND RUNWAY WEST

OREGON DEPARTMENT OF AVIATION

AURORA STATE AIRPORT
MASTER PLAN UPDATE - COST ESTIMATES
DRAFT

ALTERNATIVES 1A, 1B AND 2 SUMMARY

October 15, 2024

No.	Project Description	Estimated Cost
ALTERNATIVE 1B - SHIFT HIGHWAY AND RUNWAY WEST		
1	Realign Hubbard Highway	$ 33,715,000.00
2	Septic Drainfield Removal in ROFA By Others (Drainfields: Keil Rd, Columbia, & Wylee)	$ 1,407,000.00
3	Fill Taxiway Drainage Ditch	$ 3,603,000.00
4	Relocate AWOS, Windcone, and Segmented Circle	$ 1,726,000.00
5	Realign Keil Road	$ 3,162,000.00
6	Property Acquisition - Southeast Side Aeronautic Parcels - Phase I*	$ 3,048,000.00
7	Property Acquisition - Northeast Side Aeronautic Parcels*	$ 1,891,000.00
8	Property Acquisition - West Side Hubbard Highway*	$ 21,662,000.00
9	Property Acquisition - Keil Road Realignment*	$ 1,184,000.00
10	Construct Vehicle Service Road	$ 2,638,000.00
11	Septic Drainfield Removal By Others (TEC Equipment)	$ 345,000.00
12	Construct Taxiway A	$ 12,002,000.00
13	Runway 17 RPZ Clearance	$ 3,259,000.00
14	Construct Extended Runway/ Extend Taxiway A	$ 23,264,000.00
15	Reconstruct ADG II Parallel Taxilane and Connectors (Taxilane South of Main Apron)	$ 6,485,000.00
16	Reconstruct ADG I Parallel Taxilane and Connectors (Taxilane North of Main Apron)	$ 4,802,000.00
17	Remove Existing Hangars in Flight School Area	$ 1,309,000.00
18	Construct New Flight School Apron	$ 2,651,000.00
19	Rehablitate and Reconfigure Main Apron Taxilanes and Tie Downs	$ 821,000.00
20	Construct Helicopter Parking Apron	$ 2,507,000.00
	ALTERNATIVE 1B - SHIFT HIGHWAY AND RUNWAY WEST	**$ 131,480,000.00**

TABLE 5-3: COST ESTIMATE – ALTERNATIVE 2 - SHIFT RUNWAY EAST

CENTURY WEST ENGINEERING

OREGON DEPARTMENT OF AVIATION

AURORA STATE AIRPORT
MASTER PLAN UPDATE - COST ESTIMATES
DRAFT

ALTERNATIVES 1A, 1B AND 2 SUMMARY

October 15, 2024

No.	Project Description	Estimated Cost
ALTERNATIVE 2 - SHIFT RUNWAY EAST		
1	Septic Drainfield Removal in ROFA By Others (Drainfields: Keil Rd, Columbia, & Wylee)	$ 1,407,000.00
2	Fill Taxiway Drainage Ditch	$ 3,603,000.00
3	Relocate AWOS, Windcone, and Segmented Circle	$ 1,726,000.00
4	Realign Keil Road	$ 3,162,000.00
5	Property Acquisition - Southeast Side Aeronautic Parcels - Phase I*	$ 5,825,000.00
6	Property Acquisition - Southeast Side Aeronautic Parcels - Phase II*	$ 61,539,000.00
7	Property Acquisition - Northeast Side Aeronautic Parcels*	$ 9,274,000.00
8	Property Acquisition - Keil Road Realignment*	$ 1,184,000.00
9	Construct Vehicle Service Road	$ 2,638,000.00
10	Septic Drainfield Removal By Others (TEC Equipment)	$ 345,000.00
11	Reconstruct Taxiway A	$ 12,088,000.00
12	Runway 17 RPZ Clearance	$ 3,087,000.00
13	Reconstruct and Extend Runway/ Extend Taxiway A	$ 23,179,000.00
14	Reconstruct ADG II Parallel Taxilane and Connectors (Taxilane South of Main Apron)	$ 6,566,000.00
15	Reconstruct ADG I Parallel Taxilane and Connectors (Taxilane North of Main Apron)	$ 4,823,000.00
16	Remove Existing Hangars in Flight School Area	$ 1,309,000.00
17	Construct New Flight School Apron	$ 2,651,000.00
18	Rehablitate and Reconfigure Main Apron Taxilanes and Tie Downs	$ 767,000.00
19	Relocate Air Traffic Control Tower	$ 21,008,000.00
20	Remove Existing Hangars on South Hangar Area	$ 12,781,000.00
21	Construct South Apron	$ 11,179,000.00
	ALTERNATIVE 2 - SHIFT RUNWAY EAST	**$ 190,140,000.00**

PREFERRED ALTERNATIVE

The preferred alternative was described and depicted earlier in the chapter (see **Figure 5-1**). The timeline for the alternatives evaluation was also summarized earlier. The following section provides additional details about the refinements that were incorporated into the preferred alternative.

- **Remove the future proposed parallel taxilane.** The proposed parallel taxilane was identified through the planning process as an improvement that would assist Air Traffic Control (ATC) in the safe and efficient movement of aircraft. This would address concerns about bottlenecks with aircraft maneuvering on Taxiway A and any need to pull aircraft off on adjacent TTF aprons. The removal of the parallel taxilane from the Preferred Alternative would eliminate the need to remove hangars and acquire additional property.
- **Remove the future proposed vehicle service road that would require property acquisition.** The proposed VSR was identified through the planning process as an improvement to reduce V/PDs and provide a safer route for vehicles maneuvering through the Airport. Through the input received on the Preferred Alternative, the Preferred Alternative will depict VSRs where possible on state-owned property and continue to share use of taxilanes where VSRs are not possible. Continuing discussions on developing an Internal Circulation Road in conjunction with private properties will continue separate from the master plan.
- **Clarify the mitigation of non-standard septic drain fields in the RSA.** The septic drain fields located in the existing and the future RSA, as they are currently constructed, do not meet FAA grading or load bearing standards for RSAs. Therefore, based on current conditions and applicable design standards, the drain fields are not permitted to remain in the current/future RSA for Runway 17/35. Options to mitigate the non-standard conditions may be considered if they are able meet all FAA standards, to allow the existing drain fields to be improved in their current locations. If proposed improvements cannot demonstrate an ability to meet RSA standards, the drain fields will be removed.
- **Future property acquisition.** The Preferred Alternative includes only property acquisition needed to meet ROFA and TOFA standards, which are identified as "Priority." Any proposed improvements to relocate built-items outside of the ROFA (e.g., Hubbard Highway and Keil Road) will require additional property acquisition beyond the footprint of the ROFA. The ultimate locations of these built-items will be determined during project design.
- **Additional property has been identified as "Reserve."** It will be included in the ALP to allow ODAV to acquire any properties that may come available for purchase using FAA grant funding. Any potential property acquisition must be shown in the master plan in order for it to be eligible for the use of federal funds. Depiction of these Reserve properties on the ALP is not a plan or a commitment for acquisition and is only depicted in the event of a willing seller through this airport master planning period. Additionally, ODAV has received requests and offers from some PAC members who are property owners to acquire portions of property adjacent to the Airport.

As mentioned in the Preferred Alternative Summaries, maintaining current non-standard RSA and TSA or ROFA conditions is not acceptable to the FAA. The Preferred Alternative depicts the needed improvements to comply with RSA and ROFA standards. There was no change in recommendation to the other proposed improvements, including:

- Proposed runway extension
- Relocation/shift of Hubbard Highway and Keil Road outside of ROFA
- Relocation of the ASOS and Windcone outside of ROFA
- Reconfigured apron tiedowns to meet standards
- Future depicted hangar sites on state-owned property

The resulting concept was presented to the PAC in PAC Meeting #9 as the Preferred Alternative and is shown in **Figure 5-30**.

The Preferred Alternative was broken into two phases based on priority of implementation. The first phase is comprised of projects required to meet ROFA, RSA, and TOFA standards, including relocating Hubbard Highway and Keil Road, improvement of the existing septic drain fields to meet RSA standards or removal of those drain fields if RSA standards cannot be met, and property acquisition required to gain control of the existing ROFA. These projects are depicted in **Figure 5-31**. The second phase includes enhancements to the Airport including the runway extension, property acquisition to control the extended ROFA, improvement or removal of the north septic drain field required to meet standards for the extended RSA, and landside improvements. These projects are depicted in **Figure 5-32**.

FAA has indicated through the planning process that any runway extensions would require the ROFA and RSA to be in compliance with FAA standards. FAA has also indicated that Modifications of Standards (MOS) are temporary, project-specific, and not a permanent solution for non-standard conditions. The FAA has indicated throughout the master plan's alternatives evaluation process, that they are unable to issue a MOS as part of the ALP approval.

An overview of property acquisition included in the Preferred Alternative is presented in **Figure 5-33**.

OPTIONAL SITING FEASIBILITY STUDY

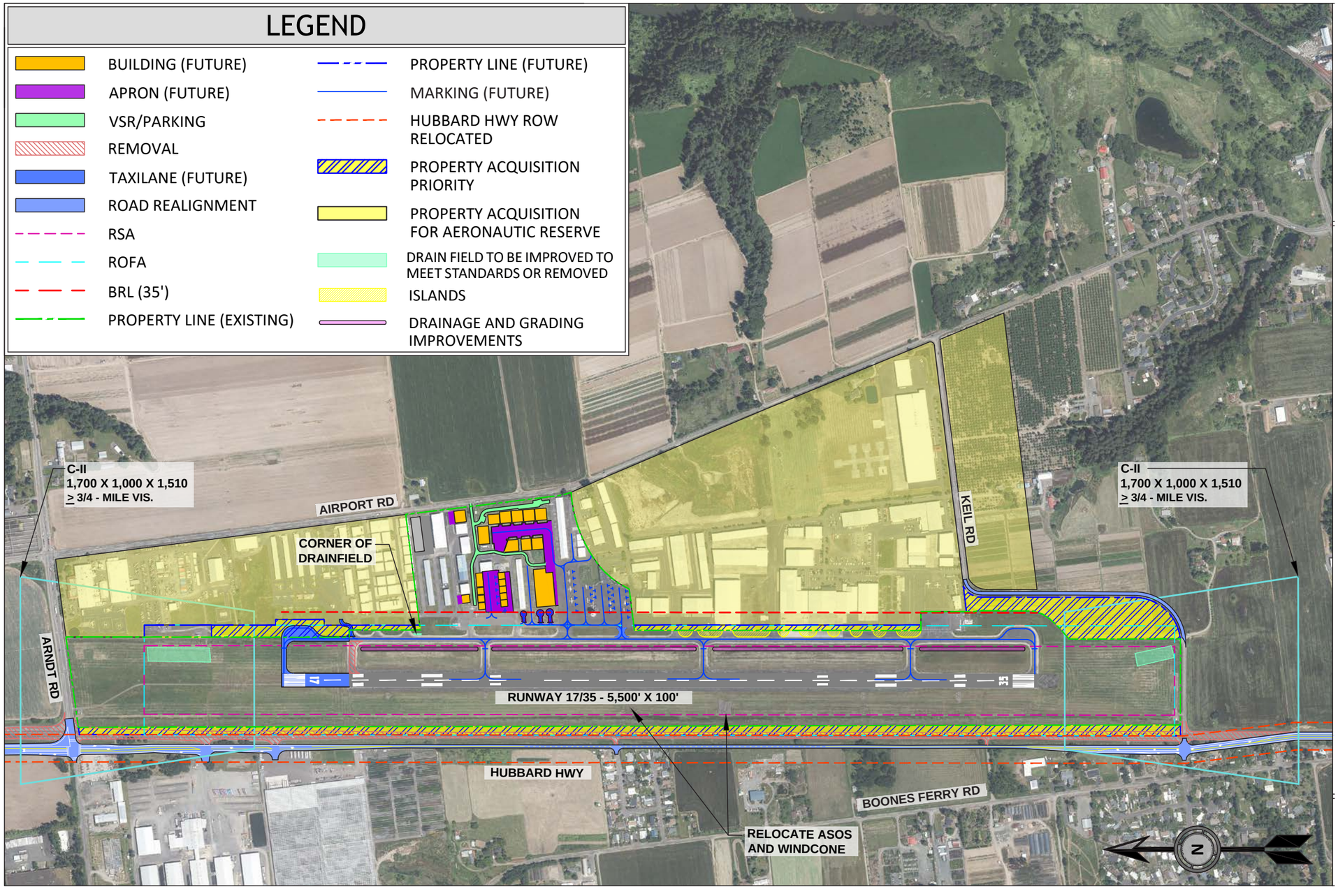
Although the Preferred Alternative meets FAA design standards and the needs of the Facility Requirements, ODAV may consider pursuing an airport siting feasibility study to evaluate future airport locations on sites that are less constrained, based on feedback received through the planning process.

Refined Cost Estimates

The preliminary cost estimate previously prepared for Refined Preliminary Alternative 1A was updated to reflect changes implemented as it was refined to reflect PAC and public input as shown in the Preferred Alternative. Detailed cost estimates for the Preferred Alternative are provided and discussed in Chapter 7 – Capital Improvement Plan.

REFINED PREFERRED ALTERNATIVE

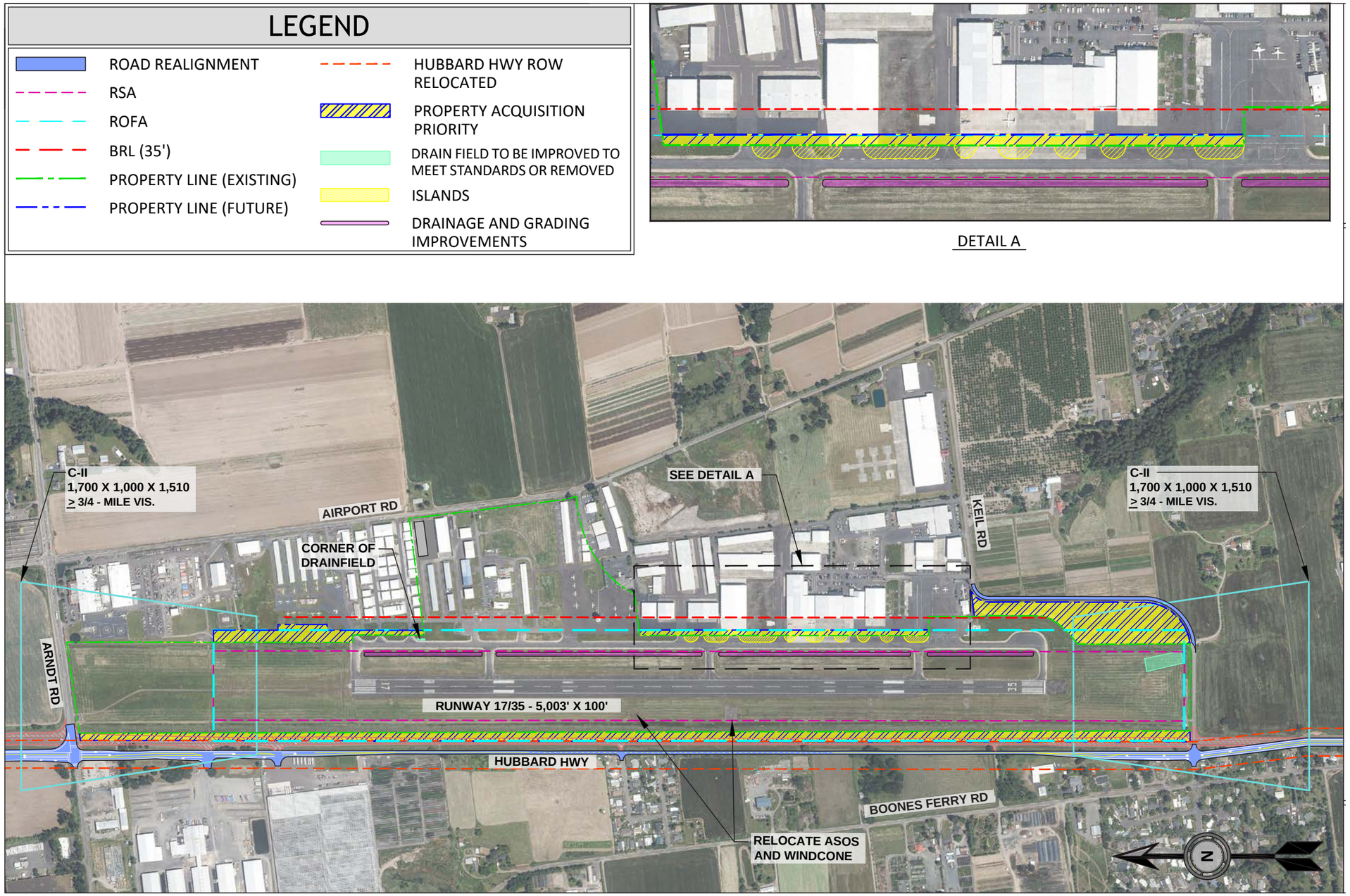
Overview



CENTURY WEST ENGINEERING

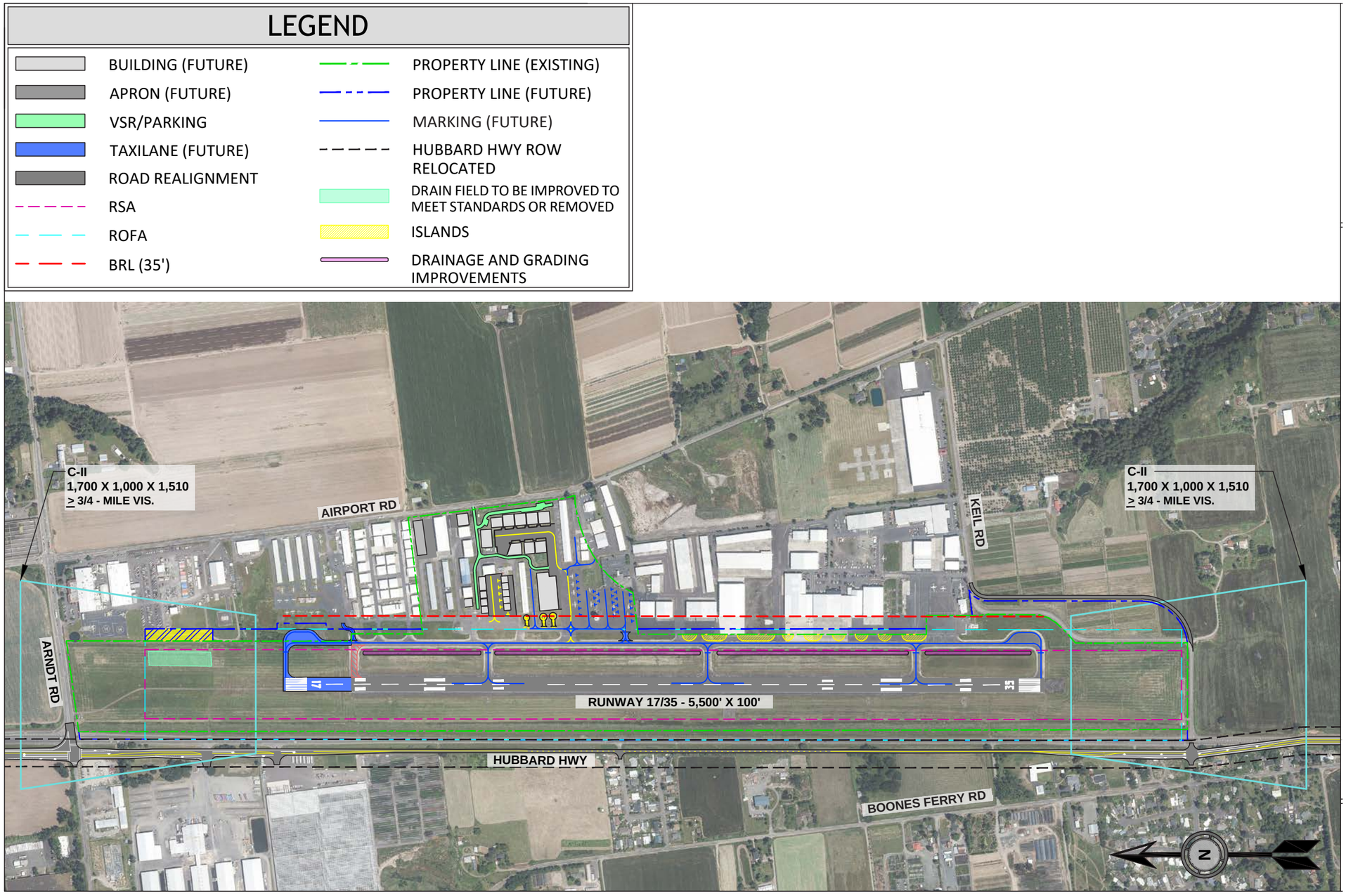
REFINED PREFERRED ALTERNATIVE

Phase – Meeting ROFA/RSA/TSA Standards



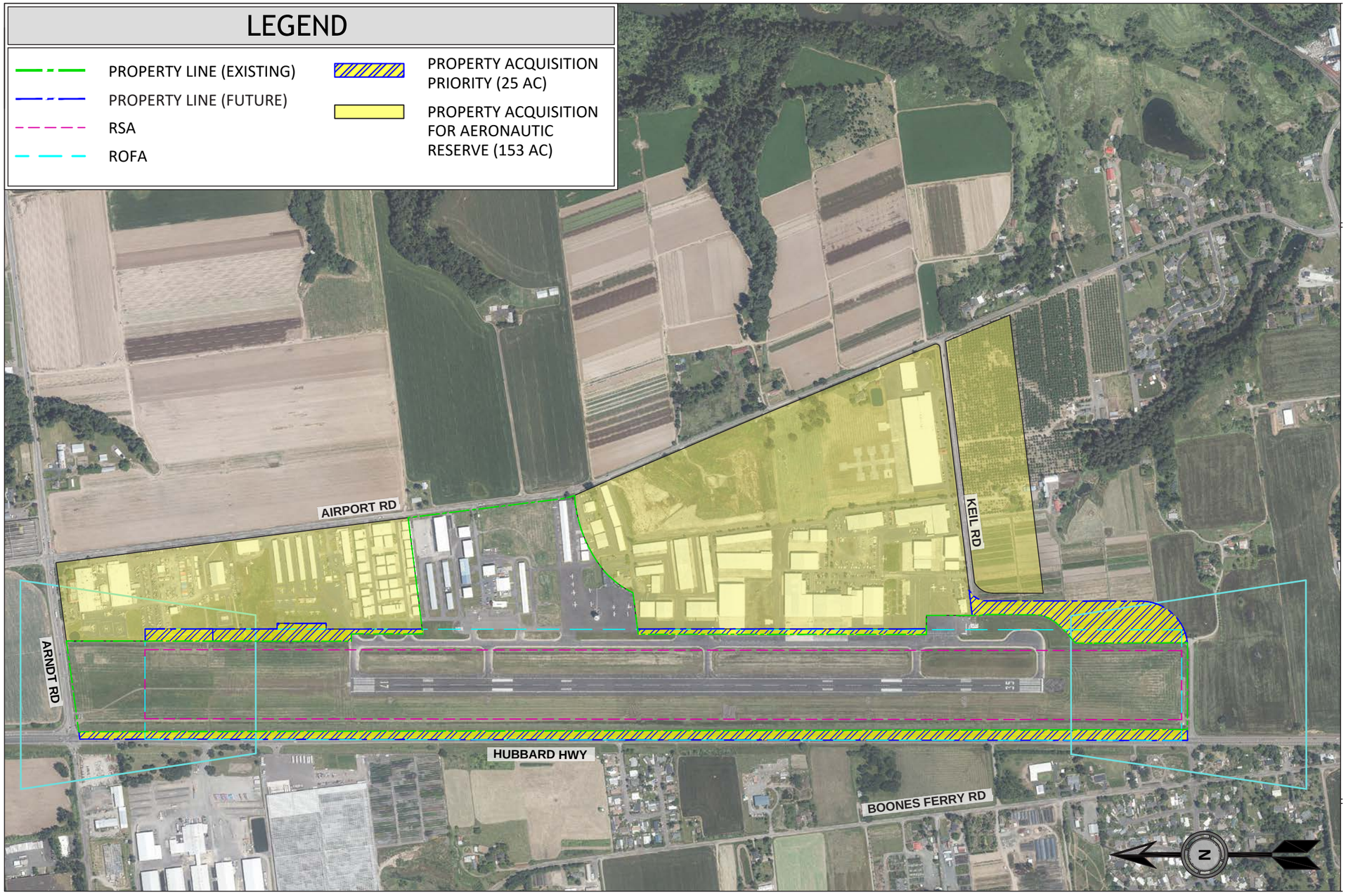
REFINED PREFERRED ALTERNATIVE

Phase – North Runway Extension



REFINED PREFERRED ALTERNATIVE

Property Acquisition Overview



Runway 17-35 – Source: ODAV

Chapter 6

Airport Layout Plan

Introduction

This chapter presents the Airport Layout Plan (ALP) for the Aurora State Airport (UAO). The ALP describes and graphically depicts recommended development for the Airport based on facility needs and forecast demand. The recommendations shown on the ALP reflect the preferred alternative selected by the Oregon Department of Aviation (ODAV) with input provided by the Federal Aviation Administration (FAA), the master plan's Planning Advisory Committee (PAC), airport stakeholders, airport users, and members of the community. The analyses and findings of the previous chapters provided the technical and policy guidance for this plan's outcome as reflected in the ALP.

The following sheets make up the set of drawings commonly referred to as the ALP:

Sheet 1 – Title Sheet
Sheet 2 – Airport Data Sheet
Sheet 3 – Airport Layout Plan
Sheet 4 – Terminal Area Plan
Sheet 5 – Airport Airspace Plan (Part 77)
Sheet 6 – Runway 17 Plan & Profile
Sheet 7 – Runway 35 Plan & Profile
Sheet 8 – Inner Portion Runway 17-35 Approach Surfaces
Sheet 9 – Runway 17-35 Centerline Profile
Sheet 10 – Runway 17-35 Instrument Departure Surfaces
Sheet 11 – On Airport Land Use
Sheet 12 – Off Airport Land Use with 2041 Noise Contours
Sheet 13 – Exhibit A - Airport Property Plan
Sheet 14 – Exhibit A - Data Tables
Sheet 15 – Airspace Obstruction Data Tables
Sheet 16 – Airspace Obstruction Data Tables
Sheet 17 – Airspace Obstruction Data Tables

A brief summary of the sheets are provided below:

Title Sheet

The Title Sheet serves as an introduction to the ALP drawing set. It provides the Airport's location and vicinity map and an index of the drawings. Additionally, the FAA approval letter is embedded into the Title Sheet, in lieu of signing the ALP and Exhibit A Sheets.

Airport Data Sheet

The Airport Data Sheet contains detailed runway and taxiway dimensions, FAA dimensional standards, wind roses, and other data that is reflected within the drawing set. It is noted the current "C-II" design standard for Runway 17-35 are maintained (no change) through the current 20-year planning period.

Airport Layout Plan

The ALP drawing graphically depicts existing and proposed airfield facilities for airport-owned property. Future facilities are color-coded to distinguish them from existing facilities; however, the ultimate configuration and facilities constructed may vary based on demand and coordination with FAA through the environmental and engineering design process. Future facilities depicted are represented in the airport master plan's 20-year capital improvement program (CIP) as individual projects or project groupings.

As discussed in the Alternatives Chapter, the primary projects depicted on the ALP are:

- Shift Highway 551 (Hubbard Highway) and right-of-way approximately 80 feet west to clear the existing Runway Object Free Area (ROFA)
- Improvements to the Runway Safety Area (RSA) to mitigate the drainage ditch along Taxiway A, and the septic drainfield located near the sound end of the runway.
- Reroute Keil Road east, outside of the ROFA
- Extend Runway 17-35, RSA, ROFA, and Taxiway A 497 feet to the north
- Relocate the ASOS, segmented circle, and the wind cone outside of the ROFA and RSA
- Property acquisition within the ROFA and Taxiway Object Free Areas (TOFA) (25 acres)

Terminal Area Plan

The Terminal Area Plan provides additional detail for existing and new facilities in the ODAV-owned landside areas. The Terminal Area Plan focuses on the main apron area and adjacent hangars in greater detail than the Airport Layout Plan. This sheet depicts the Air Traffic Control Tower (ATCT), existing and future hangar areas, apron tiedowns and future helicopter parking positions, vehicle parking and access roads, airport fencing and gates.

Airport Airspace Plan (Part 77)

The Part 77 Airspace drawings depict the protected airspace defined for the airport's runways in Code of Federal Regulations (CFR) Title 14, Part 77, Safe, Efficient Use, and Preservation of the Navigable Airspace. The airspace plan depicts the five "imaginary surfaces" defined in Part 77.25 including the primary, transitional, approach, horizontal, and conical surfaces and documented obstacles within each surface. Part 77 surfaces should be free of built or terrain obstructions to the greatest extent possible. Objects that penetrate Part 77 surfaces may require action to mark or remove depending on their severity, location, and the feasibility of the action. The drawing is supplemented by tables (sheets 15-17) detailing the obstacles with recommended dispositions. Obstacles depicted on the Airspace Plan were identified through the AGIS survey element of the airport master plan.

The physical characteristics of the Part 77 surfaces are defined by the size of aircraft using the runway and the approach capabilities of the runway. The current Part 77 airspace designations for Runway 17-35 are maintained (no change) through the 20-year planning period.

Runway 17-35 Approach Surfaces: Extend 10,000 feet from the ends of the runway primary surface. Each runway end has a non-precision instrument (NPI) approach surface slope of 34:1, which represents the horizontal distance required for each increment of vertical rise.

Runway 17-35 Primary Surface: Based on the non-precision instrument approach standards for larger than utility runways, the primary surface is 500 feet wide extending 200 feet beyond each end of the runway. The primary surface is a flat plane of airspace centered on the runway, with the same elevation as the nearest point on the runway centerline.

Transitional Surface: The runway transitional surface extends outward from the outer edges of the primary surface. The transitional surface has a slope of 7:1 and extends upward to an elevation 150 feet above airfield elevation, where it connects to the runway horizontal surface.

Horizontal Surface: The horizontal surface is drawn from 10,000-foot radii that extends from both ends of the primary surface to form an oval. The horizontal surface is a flat plane of airspace with an elevation 150 feet above airport elevation.

Conical Surface: The conical surface extends upward from the outer edge of the horizontal surface at a slope of 20:1 for 4,000 feet.

Runway 17 & 35 Approach Plan & Profile

The Approach Plan and Profile drawing depicts detailed plan and profile views of the existing/future approach surfaces and threshold siting surfaces for Runway 17 and 35. The drawing identifies penetrating obstacles and non-penetrating obstacles (provided for reference only) for the 34:1 approach and threshold-siting surfaces. The obstruction tables for the runway approaches, with recommended dispositions, are provided on sheets 15-17.

Inner Portion Runway 17-35 Approach Surfaces

The Runway Inner Approach Surface drawings depict detailed plan and profile views of the inner portion approach surfaces from the future runway end to a position where the surface is 100 feet above the runway end. The drawings provide additional detail in identifying obstructions, terrain and other physical features within the approach surfaces. The drawings include obstructions identification numbers for obstructions depicted on the drawing, using the same numbering identifiers from the overall Part 77 Airspace Plan. Only obstructions that are 10 feet below the approach surface or higher, and traverseways are called out on the sheet and listed in the obstruction tables at the end of the sheet set.

Runway 17-35 Centerline Profile

The Runway 17-35 Centerline Profile sheet details the centerline profile of the existing and future runway and RSA. The runway centerline profile sheet depicts runway and RSA elevations, gradients, vertical curves, and a line representing the line-of-sight five feet above the runway. A plan view of Runway 17-35 and the RSA is also shown above the profile for reference.

Runway 17-35 Instrument Departure Surfaces

The Departure Surface drawing depicts a plan and profile view of the departure surfaces and associated obstacles. Runway departure surfaces are defined in *AC 150/5300-13B, Change 1 – Airport Design*. Each surface originates at the existing/future runway end and extends out for 12,152 feet at a slope of 40:1 (40 feet of horizontal distance for each foot of vertical rise). The inner width of the surface coincides with the runway width (100 feet) and extends to an outer width of 6,612 feet. The drawing provides details on obstructions, terrain and other features as they relate to the departure surfaces.

On Airport Land Use

The On Airport Land Use Plan drawing depicts the existing land use designations for the Airport (ODAV-owned property). Existing and future avigation easements are depicted for parcels surrounding the Airport. Marion County is the jurisdiction responsible for the zoning and land use approvals at the Aurora State Airport. The following section describes off airport land use in the vicinity of the Airport.

Off Airport Land Use

The Off Airport Land Use Plan drawing depicts the existing zoning designations for the Airport and surrounding areas designated by local jurisdictions. It also depicts common airport traffic patterns, 2041 noise contours, and portions of the Part 77 airspace for Runway 17-35. The City of Aurora, Marion County, Clackamas County, and the City of Wilsonville have land use jurisdiction for the areas surrounding the Aurora State Airport. These jurisdictions each have land areas located within the boundaries of the Part 77 airspace defined for Runway 17-35. The jurisdictions are responsible for implementing land use controls, consistent with Oregon state law, which are intended to protect public use airports.

Exhibit 'A' – Airport Property Plan

The Exhibit A Property Plan depicts all property currently owned or controlled by ODAV that is associated with the Aurora State Airport. Future properties and easements to be acquired are depicted, and were identified in the master plan process to either support projects that meet FAA design standards or accommodate forecast demand. Reserve property is also depicted, in the event of a willing seller to allow for FAA funding eligibility.

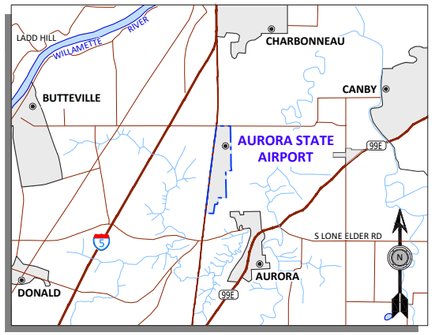
The drawing notes the form of ownership or control (fee simple, easement, etc.) and the date of acquisition per FAA guidelines. An Exhibit A – Property Plan Data Tables extend to the following sheet, (Sheet 14).

Airspace Obstruction Tables

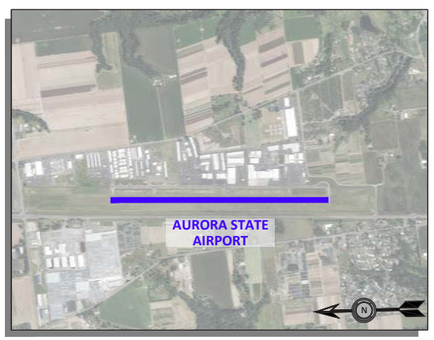
The obstacles depicted on several drawings in the ALP set are listed in tabular form on three separate drawings (sheets 15-17). Each listed obstacle has location and elevation information, and a proposed disposition.

AURORA STATE AIRPORT (UAO)
AIRPORT LAYOUT PLAN

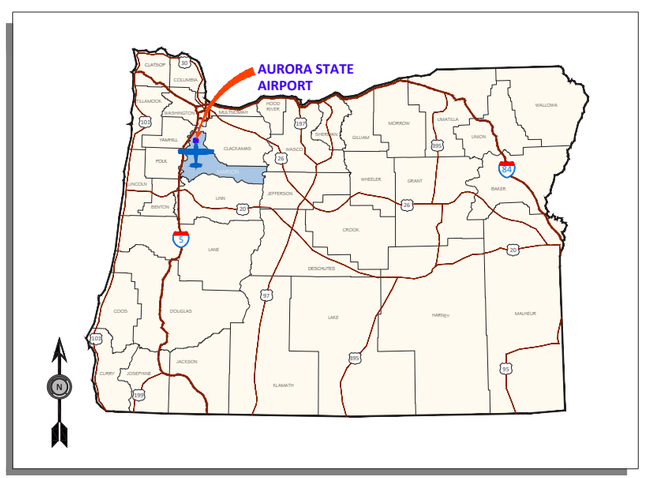
MARION COUNTY, OREGON
AIP NO. 3-41-0004-022-2021
AIRPORT MASTER PLAN
MAY 2025



VICINITY MAP



AERIAL PHOTO



LOCATION MAP

SHEET INDEX

NUMBER	REV. DATE	CONTENTS
1		TITLE SHEET
2		AIRPORT DATA SHEET
3		AIRPORT LAYOUT PLAN
4		TERMINAL AREA PLAN
5		AIRPORT AIRSPACE PLAN (PART 77)
6		RUNWAY 17 PLAN & PROFILE
7		RUNWAY 35 PLAN & PROFILE
8		INNER PORTION RUNWAY 17-35 APPROACH SURFACES
9		RUNWAY 17-35 CENTERLINE PROFILE
10		RUNWAY 17-35 INSTRUMENT DEPARTURE SURFACES
11		ON AIRPORT LAND USE PLAN
12		OFF AIRPORT LAND USE PLAN WITH 2041 NOISE CONTOURS
13		EXHIBIT A - AIRPORT PROPERTY PLAN
14		EXHIBIT A - DATA TABLES
15		AIRSPACE OBSTRUCTION DATA TABLES
16		AIRSPACE OBSTRUCTION DATA TABLES
17		AIRSPACE OBSTRUCTION DATA TABLES

FAA APPROVAL LETTER

DRAFT

"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 3-41-0004-022-2021) 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."

NO.	DATE	BY	APPR	REVISIONS

VERIFY SCALES

BAR IS ONE INCH ON ORIGINAL DRAWING.
0" 1"
IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY.

FEDERAL AVIATION ADMINISTRATION APPROVAL

APPROVAL DATE: _____

SIGNATURE

OREGON DEPARTMENT OF AVIATION APPROVAL

APPROVAL DATE: _____

SIGNATURE

CENTURY WEST ENGINEERING

BEND OFFICE
1020 SW EMKAY DRIVE
SUITE #100
BEND, OR 97702
541.322.8962 OFFICE

DESIGNED BY:	DRAWN BY:	CHECKED BY:	SCALE:
JLS	JLS	DM	AS SHOWN
DATE: MAY 2025		PROJECT NO: 40097.106.01	

AURORA STATE AIRPORT

TITLE SHEET

FIGURE NO. -

SHEET NO. 1 OF 17

AIRPORT DATA

		EXISTING (E)	FUTURE (F)
AIRPORT IDENTIFIER		UAO	SAME
MEAN MAX TEMPURATURE		83° (F)	SAME
AIRPORT ELEVATION		199.6'	SAME
AIRPORT ACREAGE	(SEE NOTE 4)	148	173
NAVAIDS		LOC, GPS, VASI, ODALS, DME, APBN	LOC, GPS, PAPI, ODALS, DME, APBN
AIRPORT REFERENCE POINT	LAT.	N 45° 14' 49.66"	N 45° 14' 52.09"
	LONG.	W 122° 46' 12.17"	W 122° 46' 11.74"
MISCELLANEOUS FACILITIES		LIGHTED WIND CONE (2), ASOS. MIRL, MITL	SAME
MAGNETIC DECLINATION (1)		14° 42' E ± 0° 23'	0° 6' W ANNUALLY
NIPIAS SERVICE LEVEL		NATIONAL	SAME
STATE SERVICE LEVEL		URBAN GENERAL AVIATION	SAME

1. NATIONAL GEODETIC SURVEY MAGNETIC DECLINATION CALCULATOR (HTTPS://WWW.NGDC.NOAA.GOV/GEOMAG/CALCULATORS/MAGCALC.SHTML#DECLINATION) ACCESSED ON JUNE 28, 2024

RUNWAY 17-35 DATA

		EXISTING (E)	FUTURE (F)
RUNWAY IDENTIFICATION		17-35	SAME
RUNWAY DESIGN CODE (RDC)		C-II-4000	SAME
APPROACH REFERENCE CODE (APRC)		B-III-4000/D-II-4000	SAME
DEPARTURE REFERENCE CODE (DPRC)		B-III/D-II	SAME
CRITICAL AIRCRAFT		CHALLENGER 601	SAME
RUNWAY PAVEMENT TYPE		ASPHALT	SAME
PAVEMENT STRENGTH		30,000 SWG/45,000 DWG	SAME
PAVEMENT CLASSIFICATION NUMBER (PCN)		35/F/C/X/T	SAME
RUNWAY SURFACE TREATMENT		GROOVED	SAME
RUNWAY PERCENT GRADIENT / MAXIMUM GRADE		0.07%	0.06%
PERCENT WIND COVERAGE		SEE WIND ROSE	
RUNWAY DIMENSIONS LENGTH AND WIDTH		5,003' X 100'	5,500' X 100'
DISPLACED THRESHOLD		N/A	SAME
DISPLACED THRESHOLD ELEVATION		N/A	SAME
DISPLACED THRESHOLD COORDINATES	LAT.	N/A	SAME
	LONG.	N/A	SAME
RUNWAY END COORDINATES	17	N45° 15' 14.16" W122° 46' 07.82"	N45° 15' 19.03" W122° 46' 06.96"
	35	N45° 14' 25.15" W122° 46' 16.51"	N45° 14' 25.15" W122° 46' 16.51"
RUNWAY END ELEVATIONS	17	199.5	SAME
	35	196.3	SAME
RUNWAY LIGHTING		MIRL	SAME
RUNWAY PROTECTION ZONE		SEE RUNWAY DESIGN SURFACES TABLE	
RUNWAY MARKING		PRECISION	NON-PRECISION
14 CFR PART 77 RUNWAY CATEGORY		NON-PRECISION	SAME
RUNWAY APPROACH SLOPE		34:1 (17) / 34:1 (35)	SAME
APPROACH VISIBILITY MINIMUMS		NOT LOWER THAN 3/4 MILE (SEE NOTE 3)	SAME
AERONAUTICAL SURVEY REQUIRED		VGS	SAME
RUNWAY DEPARTURE SURFACE		YES	SAME
RUNWAY SAFETY AREA - RSA		SEE RUNWAY DESIGN SURFACES TABLE	
RUNWAY OBJECT FREE AREA - OFA			
RUNWAY OBSTACLE FREE ZONE - OFZ			
THRESHOLD SITING SURFACE - TSS		SEE SHEETS 6 & 7	
THRESHOLD SITING SURFACE PENETRATIONS			
RUNWAY VISUAL AND INSTRUMENT NAVAIDS		LOC, GPS, VASI, ODALS, DME	LOC, GPS, PAPI, ODALS, DME
TOUCHDOWN ZONE ELEVATION (TDZE)			
	RUNWAY 17	199.6	SAME
	RUNWAY 35	198.0	SAME
TAXIWAY SAFETY AREA -TSA		SEE TAXIWAY DATA TABLE	
TAXIWAY AND TAXILANE OBJECT FREE AREA - TOFA			
TAXIWAY AND TAXILANE SEPARATION			
TAXIWAY LIGHTING		MITL	SAME
VERTICAL DATUM		NAD88	SAME
HORIZONTAL DATUM		NAVD83	SAME

DRAFT

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NOTES:

1. NATIONAL GEODETIC SURVEY MAGNETIC DECLINATION CALCULATOR (HTTPS://WWW.NGDC.NOAA.GOV/GEOMAG/CALCULATORS/MAGCALC.SHTML#DECLINATION) ACCESSED ON JUNE 28, 2024
2. AGIS SURVEY - 2022, PROVIDED RUNWAY END COORDINATES AND ELEVATIONS.
3. PUBLISHED INSTRUMENT APPROACH FOR RWY 17-35 IS CURRENTLY 3/4-MI. WITH A NOTAM TO 7/8-MI. WITH PERMANENT CHANGE RECOMMENDED.
4. SEE SHEET 14 FOR OWNERSHIP INFORMATION.

RUNWAY 17/35 DESIGN STANDARDS

	EXISTING CONDITIONS	EXISTING STANDARD	FUTURE CONDITIONS	FUTURE STANDARD
RUNWAY SAFETY AREA LENGTH AND WIDTH	7,003' X 357'	7,003' X 500'	7,500' X 500'	7,500' X 500'
LENGTH BEYOND RUNWAY END ∗	< 1000'	1000'	1000'	1000'
OBJECT FREE AREA LENGTH AND WIDTH	6,165' X 688'	7,003' X 800'	7,500' X 800'	7,500' X 800'
LENGTH BEYOND RUNWAY END ∗∗	< 1000'	1000'	1000'	1000'
OBSTACLE FREE ZONE LENGTH AND WIDTH	5,403' X 400'	5,403' X 400'	5,900' X 400'	5,900' X 400'
LENGTH BEYOND RUNWAY END	200'	200'	200'	200'

∗ EXISTING RSA LIMITED BY OPEN DRAINAGE DITCH AND SOUTH DRAIN FIELD

∗∗ EXISTING ROFA CLEARANCE LIMITED BY HIGHWAY 551 AND KEIL ROAD.

DECLARED DISTANCES

	EXISTING (E)		FUTURE (F)	
	RWY 17	RWY 35	RWY 17	RWY 35
TORA	5,003	5,003	5,500	5,500
TODA	5,003	5,003	5,500	5,500
ASDA	5,003	5,003	5,500	5,500
LDA	5,003	5,003	5,500	5,500

MODIFICATION OF DESIGN STANDARDS

APPROVAL DATE	CASE NUMBER	MODIFICATION	DESCRIPTION
"NO EXISTING FAA-APPROVED MOS"			

TAXIWAY / TAXILANE DATA TABLE

	EXISTING (E)		FUTURE (F)	
	CONDITIONS	STANDARDS	CONDITIONS	STANDARDS
TAXIWAY WIDTHS	35' / 40'	35'	35' / 40'	35'
TAXILANE WIDTHS	VARIES	35'	VARIES	35'
TAXIWAY SAFETY AREA	79'	79'	79'	79'
TAXIWAY OBJECT FREE AREA	124'	124'	124'	124'
TAXILANE OBJECT FREE AREA	VARIES	110'	VARIES	110'
TAXIWAY LIGHTING	MITL		SAME	
TAXIWAY MARKING	BASIC		SAME	

AIRPORT FACILITIES LIST

NAVIGATIONAL AID	OWNERSHIP
AIRPORT BEACON	ODAV
LIGHTED WIND CONE AND SEGMENTED CIRCLE	ODAV
ASOS	NOAA
MIRL	ODAV
MITL	ODAV
LOCALIZER	FAA
ODALS - RUNWAY 17	FAA
VASI - RUNWAY 17 - 35	FAA
DME	FAA

NON STANDARD CONDITIONS

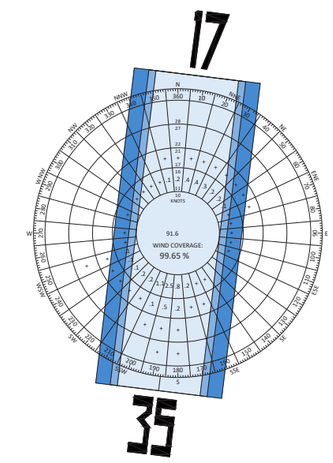
NO.	ITEM	DESCRIPTION	DISPOSITION
1	ROFA	HIGHWAY 551	RELOCATE HIGHWAY
2	RSA	DRAINFIELD	IMPROVE TO MEET FAA STANDARDS OR REMOVE
3	RSA(F)	DRAINFIELD	IMPROVE TO MEET FAA STANDARDS OR REMOVE
4	RSA	DRAINAGE DITCH	DRAINAGE /GRADING IMPROVEMENTS
5	ROFA	KEIL ROAD	RELOCATE ROAD
6	ROFA	ASOS & SEGMENTED CIRCLE	REMOVE EQUIPMENT
7	TSA	DRAINFIELD	IMPROVE TO MEET FAA STANDARDS OR REMOVE

RUNWAY 17/35 DESIGN SURFACES

RUNWAY PROTECTION ZONE (RPZ)			
	INNER WIDTH	LENGTH	OUTER WIDTH
EXISTING/FUTURE RWY 17	1,000	1,700	1,510
EXISTING/FUTURE RWY 35	1,000	1,700	1,510
RUNWAY SAFETY AREA (RSA)			
	WIDTH	LENGTH BEYOND RUNWAY END & PRIOR TO THRESHOLD	
EXISTING/FUTURE RWY 17/35	500	1,000	
RUNWAY OBJECT FREE AREA (OFA)			
	WIDTH	LENGTH BEYOND RUNWAY END & PRIOR TO THRESHOLD	
EXISTING RWY 17/35	800	1,000	
FUTURE RWY 17/35	800	1,000	
RUNWAY OBSTACLE FREE ZONE (OFZ)			
	WIDTH	LENGTH BEYOND RUNWAY END & PRIOR TO THRESHOLD	
EXISTING/FUTURE RWY 17/35	400	200	
NOTE:			

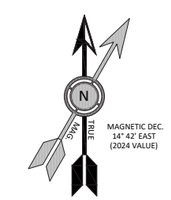
APRON DIMENSIONS

	SQUARE FOOTAGE APPROX.
APRON EXISTING	259,284
APRON FUTURE	381,666



ALL WEATHER WIND ROSE

SOURCE:
FAA AIRPORT DATA AND INFORMATION PORTAL
STATION 726959 AURORA STATE AIRPORT
PERIOD OF OBSERVATIONS : 2011-2020
NUMBER OF OBSERVATIONS : 112,706
CALM OBSERVATIONS : 37,853



RUNWAY 17/35 WIND COVERAGE

RUNWAY ALIGNMENT	CROSSWIND COMP. (KNOTS)	ALL-WEATHER WIND COVERAGE	VFR WIND COVERAGE	IFR WIND COVERAGE
RUNWAY 17	10.5	72.45%	70.80%	79.85%
	13	72.59%	70.94%	79.98%
	16	72.65%	71.01%	80.03%
RUNWAY 35	10.5	60.81%	58.04%	71.58%
	13	60.92%	58.16%	71.60%
	16	60.95%	58.20%	71.61%
COMBINED	10.5	99.65%	99.62%	99.77%
	13	99.89%	99.89%	99.92%
	16	99.99%	99.99%	99.99%

NO.	DATE	BY	APPR	REVISIONS

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SIGNATURE

CENTURY WEST ENGINEERING

BEND OFFICE
1020 SW EMKAY DRIVE
SUITE #100
BEND, OR 97702
541.322.8962 OFFICE

DESIGNED BY:	DRAWN BY:	CHECKED BY:	SCALE:
JLS	JLS	DM	AS SHOWN
DATE: MAY 2025		PROJECT NO: 40097.106.01	

AURORA STATE AIRPORT

AIRPORT DATA SHEET

FIGURE NO.

SHEET NO. 2 OF 17

LEGEND

	EXISTING (E)	FUTURE (F)
BUILDINGS - ON AIRPORT		
BUILDINGS - OFF AIRPORT		N/A
AIRPORT PAVEMENT		
TO BE REMOVED	N/A	
BUILDING RESTRICTION LINE (BRL)	BRL (E)	N/A
AIRPORT PROPERTY LINE		
RUNWAY SAFETY AREA (RSA)		
OBJECT FREE AREA (OFA)		
OBSTACLE FREE ZONE (OFZ)		
APPROACH SURFACE		
TERPS SURFACE		
TAXIWAY SAFETY AREA (TSA)		
TAXIWAY OBJECT FREE AREA (TOFA)		
RUNWAY PROTECTION ZONE (RPZ)		
AIRPORT REFERENCE POINT (ARP)		
ODALS		SAME
VISUAL GUIDANCE INDICATOR	(VASI)	(PAPI)
GROUND CONTOURS	1100	N/A
THROUGH THE FENCE ACCESS POINT		SAME
GATES		

	EXISTING (E)	FUTURE (F) / RESERVE (R)
FENCE		
BEACON		SAME
THRESHOLD LIGHTS		
AIRCRAFT PARKING AREA / TIEDOWNS		
RUNWAY LIGHTS		
TAXIWAY LIGHTS		
TAXIWAY MARKING		
RUNWAY MARKING		
ROAD / VEHICLE SERVICE ROAD (VSR)	N/A	
ILS LOCALIZER CRITICAL AREA		SAME
AVIGATION EASEMENT		
ASOS		(SEE NOTE 3)
TREE / PLANT / BUSH LINE		SAME
HUBBARD HIGHWAY RIGHT OF WAY		
DRAINAGE AND GRADING		
AIRPORT PROPERTY ACQ.	N/A	/
HIGHWAY PROPERTY ACQ.	N/A	
TOWER		N/A
SEGMENTED CIRCLE / WIND INDICATOR		(SEE NOTE 3)

NON STANDARD CONDITIONS

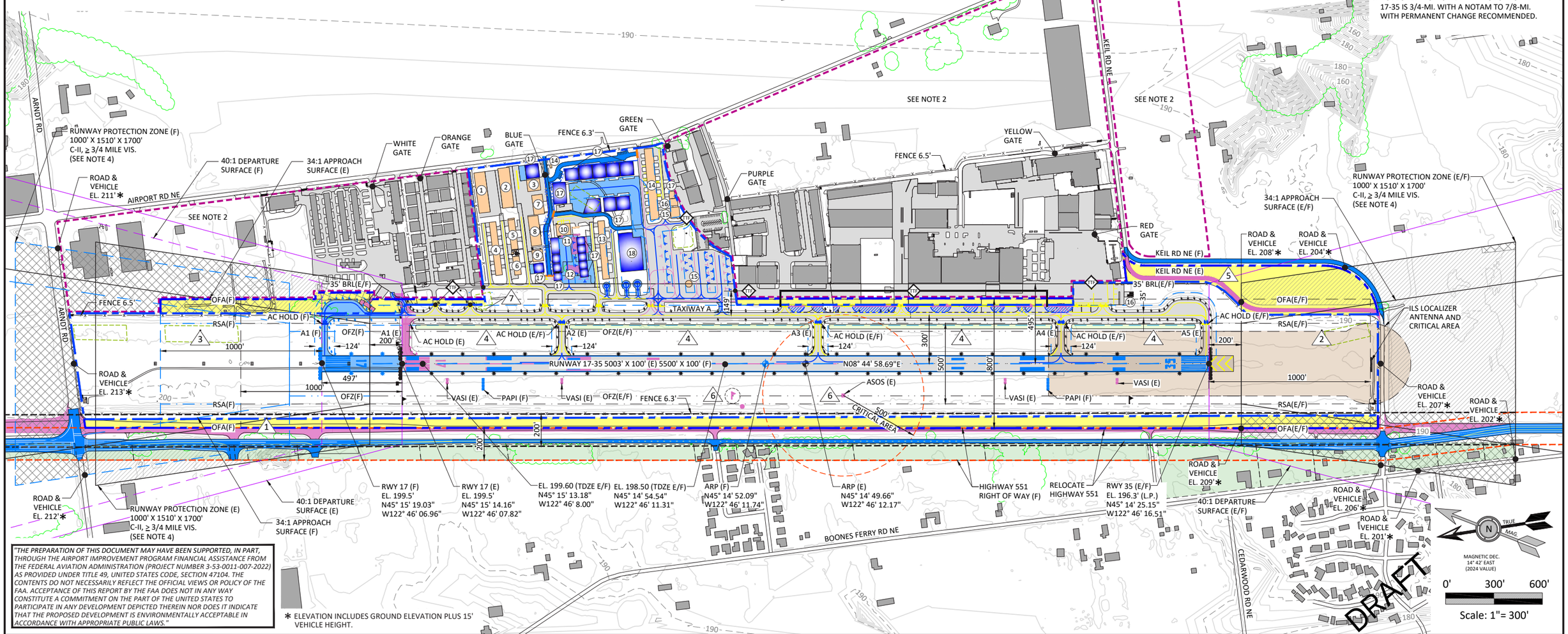
NO.	ITEM	DESCRIPTION	DISPOSITION
1	ROFA	HIGHWAY 551	RELOCATE HIGHWAY
2	RSA	DRAINFIELD	IMPROVE TO MEET FAA STANDARDS OR REMOVE
3	RSA(F)	DRAINFIELD	IMPROVE TO MEET FAA STANDARDS OR REMOVE
4	RSA	DRAINAGE DITCH	DRAINAGE /GRADING IMPROVEMENTS
5	ROFA	KEIL ROAD	RELOCATE ROAD
6	ROFA	ASOS & SEGMENTED CIRCLE	REMOVE EQUIPMENT
7	TSA	DRAINFIELD	IMPROVE TO MEET FAA STANDARDS OR REMOVE

BUILDING / FACILITY KEY

NO.	DESCRIPTION	TOP ELEV. (AGL)
1 - 10	AIRCRAFT STORAGE (E)	18'-31'
11	HANGAR (E) TO BE REMOVED	31.1'
12	FLIGHT SCHOOL (E) TO BE REMOVED	22'
13	AIRCRAFT STORAGE (E)	18'-25'
14	FIRE SUPPRESSION (E)	10.7'
15	AIRPORT TRAFFIC CONTROL TOWER-ATCT (E)	84.1'
16	FUEL (E)	7.9'
17	AIRCRAFT STORAGE (F)	25'-30' (EST.)
18	FBO / HANGAR (F)	25'-30' (EST.)

NOTES:

1. AGIS SURVEY - 2022, PROVIDED RUNWAY END COORDINATES AND ELEVATIONS.
2. RESERVE PROPERTIES ARE DEPICTED IN THE EVENT OF A WILLING SELLER TO ALLOW FOR FAA FUNDING ELIGIBILITY.
3. FUTURE LOCATION OF SEGMENTED CIRCLE, ASOS, AND RELATED EQUIPMENT TO BE DETERMINED DURING DESIGN.
4. PUBLISHED INSTRUMENT APPROACH FOR RWY 17-35 IS 3/4-MI. WITH A NOTAM TO 7/8-MI. WITH PERMANENT CHANGE RECOMMENDED.



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* ELEVATION INCLUDES GROUND ELEVATION PLUS 15' VEHICLE HEIGHT.

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SIGNATURE

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1020 SW EMKAY DRIVE
SUITE #100
BEND, OR 97702
541.322.8962 OFFICE

DESIGNED BY:	DRAWN BY:	CHECKED BY:	SCALE:
JLS	JLS	DM	AS SHOWN
DATE: MAY 2025		PROJECT NO: 40097.106.01	

AURORA STATE AIRPORT

AIRPORT LAYOUT PLAN

FIGURE NO.

SHEET NO. 3 OF 17

BUILDING/FACILITY KEY

NO.	DESCRIPTION	TOP ELEV. (AGL)
1 - 10	AIRCRAFT STORAGE (E)	18'-31'
11	HANGAR (E) TO BE REMOVED	31.1'
12	FLIGHT SCHOOL (E) TO BE REMOVED	22'
13	AIRCRAFT STORAGE (E)	18'-25'
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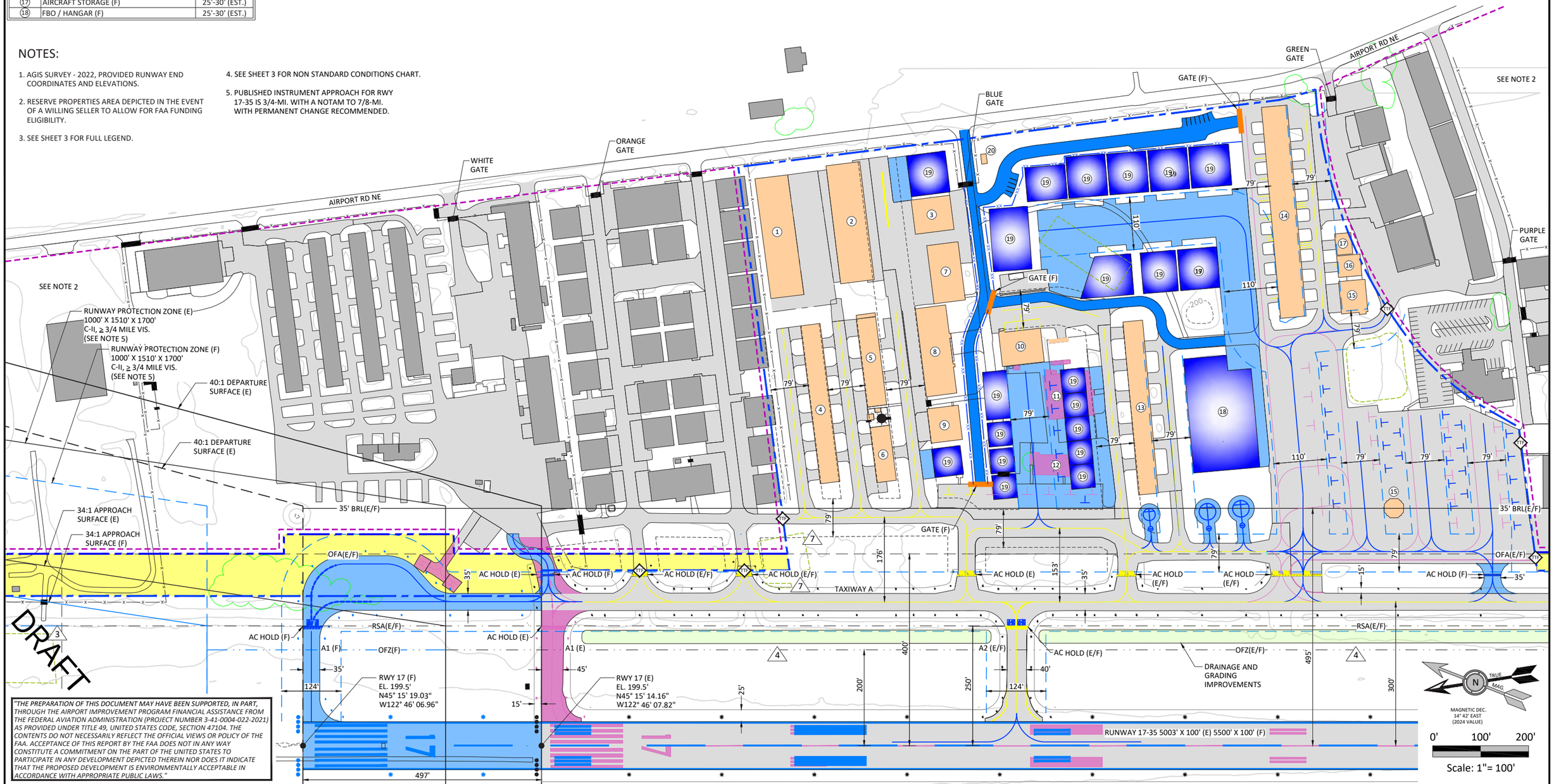
17	AIRCRAFT STORAGE (F)	25'-30' (EST.)
18	FBO / HANGAR (F)	25'-30' (EST.)

NOTES:

1. AGIS SURVEY - 2022, PROVIDED RUNWAY END COORDINATES AND ELEVATIONS.
2. RESERVE PROPERTIES AREA DEPICTED IN THE EVENT OF A WILLING SELLER TO ALLOW FOR FAA FUNDING ELIGIBILITY.
3. SEE SHEET 3 FOR FULL LEGEND.
4. SEE SHEET 3 FOR NON STANDARD CONDITIONS CHART.
5. PUBLISHED INSTRUMENT APPROACH FOR RWY 17-35 IS 3/4-MI. WITH A NOTAM TO 7/8-MI. WITH PERMANENT CHANGE RECOMMENDED.



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SUITE #100
BEND, OR 97702
541.322.8962 OFFICE

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AURORA STATE AIRPORT

TERMINAL AREA PLAN

FIGURE NO.

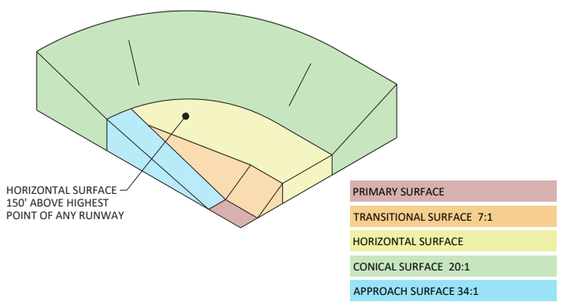
SHEET NO. 4 OF 17

PART 77 DIMENSIONAL STANDARDS

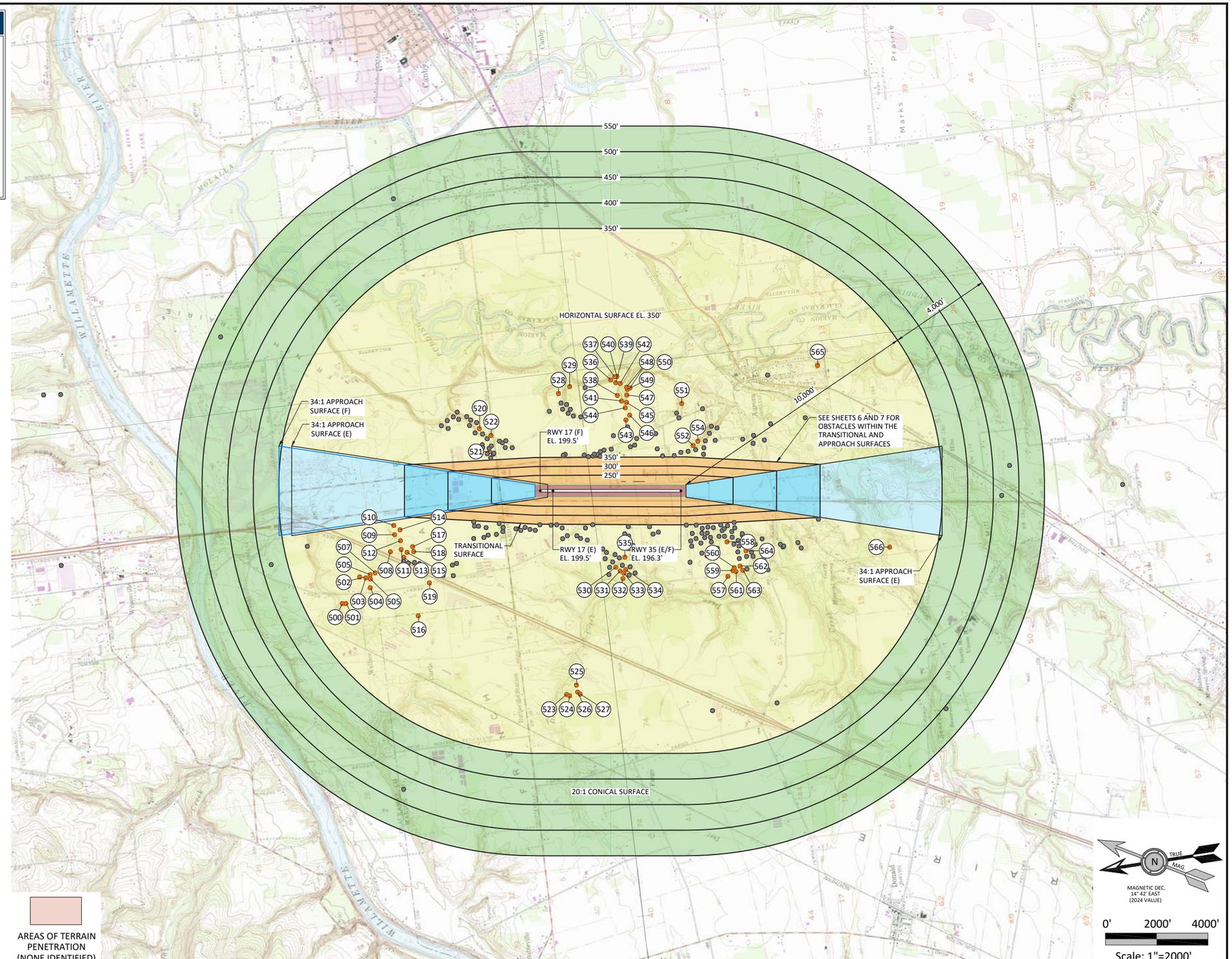
RUNWAY 17-35
NON-PRECISION INSTRUMENT LARGER THAN UTILITY (EXISTING/FUTURE)
RUNWAY LENGTH (EXISTING) = 5,003' (RUNWAY TYPE = C-II)
RUNWAY LENGTH (FUTURE) = 5,500' (RUNWAY TYPE = C-II)

RUNWAY 17
PRIMARY SURFACE WIDTH = 500'
APPROACH SURFACE INNER WIDTH = 500'
APPROACH SURFACE OUTER WIDTH = 3,500'
APPROACH SURFACE LENGTH = 10,000'
RADIUS OF HORIZONTAL SURFACE = 10,000'
APPROACH SLOPE = 34:1

RUNWAY 35
PRIMARY SURFACE WIDTH = 500'
APPROACH SURFACE INNER WIDTH = 500'
APPROACH SURFACE OUTER WIDTH = 3,500'
APPROACH SURFACE LENGTH = 10,000'
RADIUS OF HORIZONTAL SURFACE = 10,000'
APPROACH SLOPE = 34:1



TYPICAL ISOMETRIC VIEW OF PART 77 SURFACES
(CUT ON RUNWAY CENTERLINE)



LEGEND

- OBSTACLE
- NON-LISTED OBSTACLE

AREAS OF TERRAIN PENETRATION (NONE IDENTIFIED)

NOTES:

1. SEE SHEETS 15, 16, AND 17 FOR OBSTRUCTION TABLES.
2. DATE OF AGIS OBSTRUCTION SURVEY: 2022
3. SEE SHEETS 6 AND 7 FOR OBSTACLES WITHIN THE TRANSITIONAL AND APPROACH SURFACES.

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SUITE #100
BEND, OR 97702
541.322.8962 OFFICE

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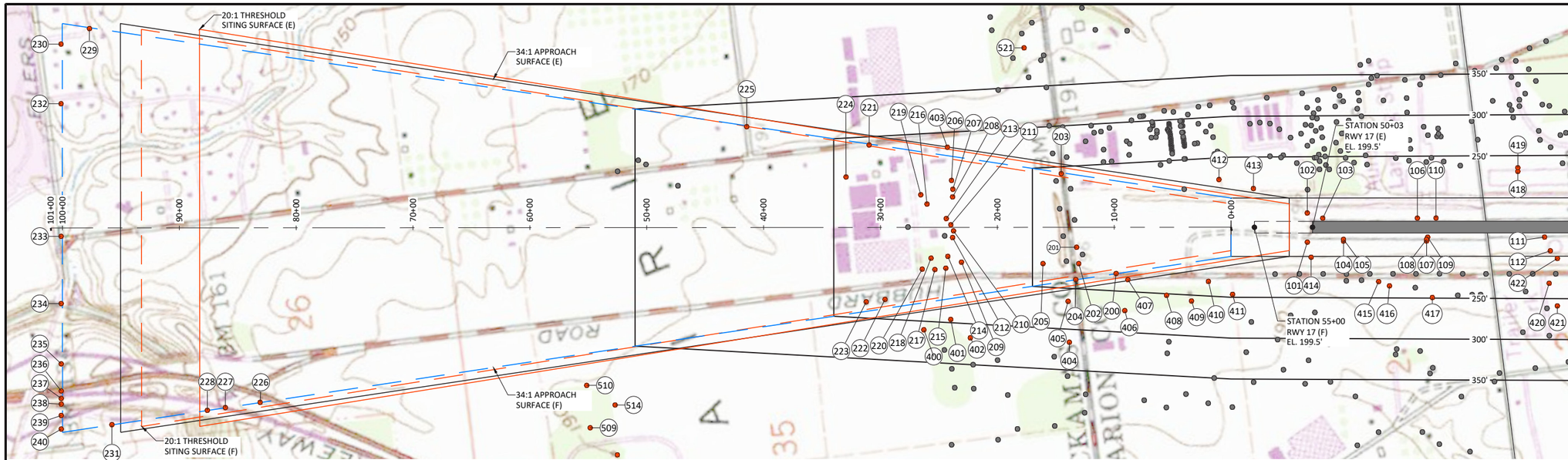
DATE: MAY 2025		PROJECT NO: 40097.106.01	

AURORA STATE AIRPORT

AIRPORT AIRSPACE PLAN (PART 77)

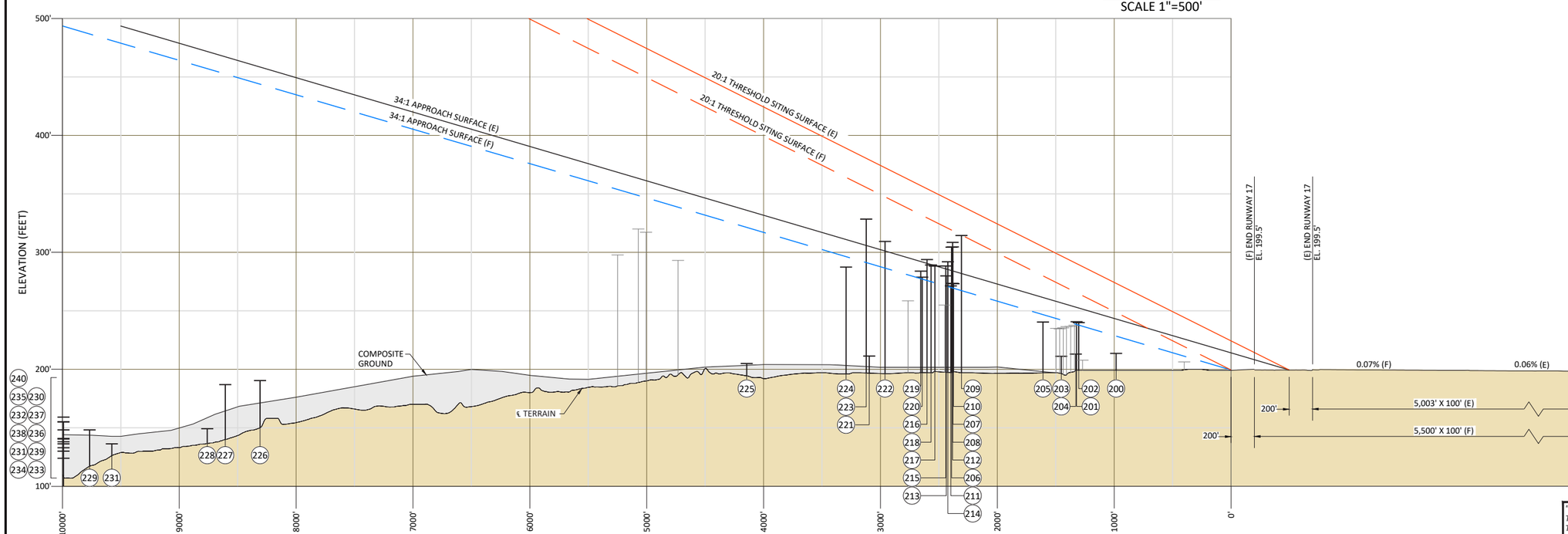
FIGURE NO.

SHEET NO. 5 OF 17



RUNWAY 17 PLAN VIEW

0' 500' 1000'
SCALE 1"=500'



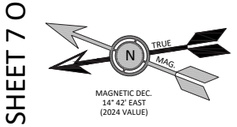
RUNWAY 17 PROFILE VIEW

0' 50' 100'
SCALE OF FEET
VERTICAL SCALE 1"=50'

0' 500' 1000'
SCALE OF FEET
HORIZONTAL SCALE 1"=500'

NOTES:

1. SEE SHEETS 15, 16, AND 17 FOR OBSTRUCTION TABLES.
2. DATE OF AGIS OBSTRUCTION SURVEY: 2022



MATCHLINE (SEE SHEET 7 OF 17)

MATCHLINE (SEE SHEET 7 OF 17)

LEGEND

AREAS OF TERRAIN PENETRATION (NONE IDENTIFIED)

- OBSTACLE
- NON-LISTED OBSTACLE

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DATE: MAY 2025		PROJECT NO: 40097.106.01	

AURORA STATE AIRPORT

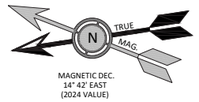
RUNWAY 17 PLAN & PROFILE

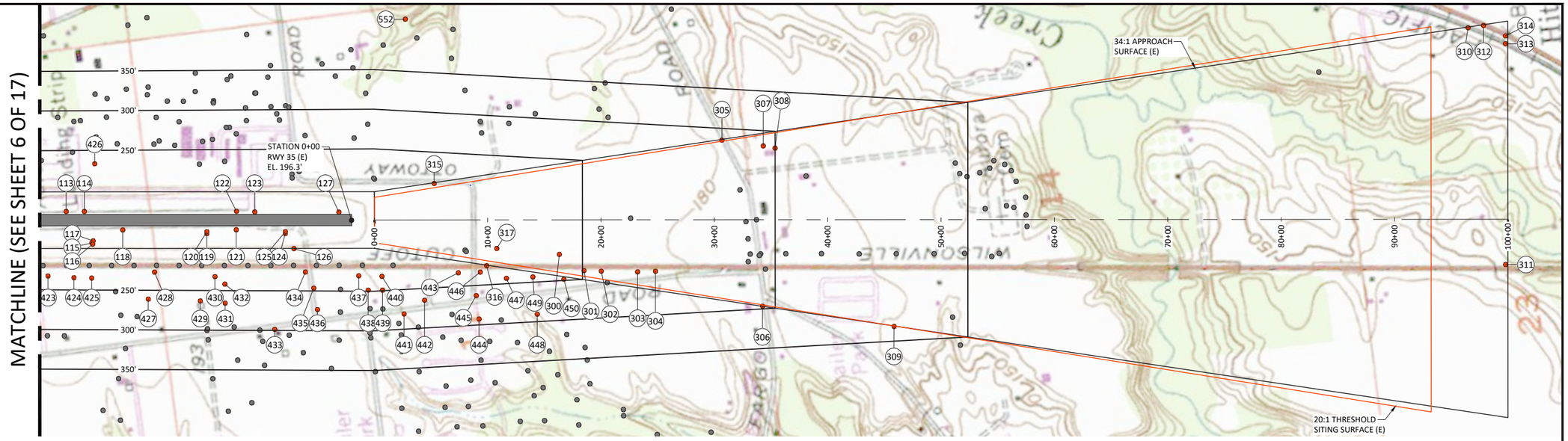
FIGURE NO.

SHEET NO. 6 OF 17

NOTES:

1. SEE SHEETS 15, 16, AND 17 FOR OBSTRUCTION TABLES.
2. DATE OF AGIS OBSTRUCTION SURVEY: 2022





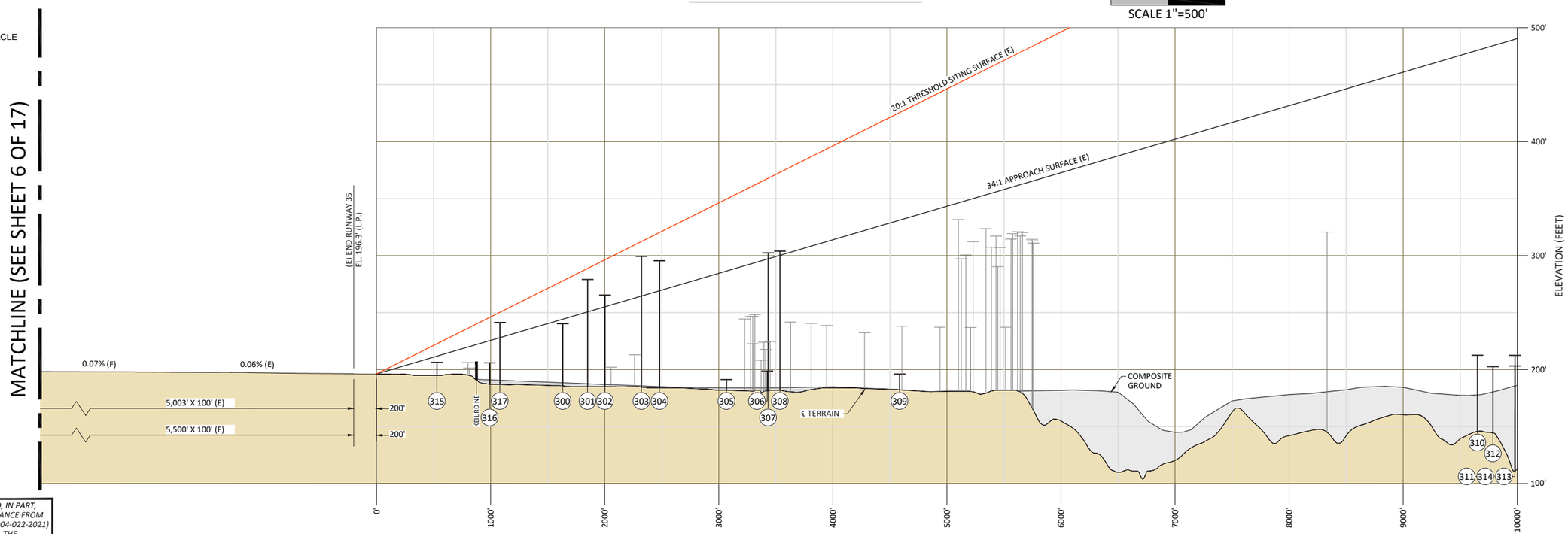
RUNWAY 35 PLAN VIEW

0' 500' 1000'
SCALE 1"=500'

LEGEND

AREAS OF TERRAIN PENETRATION (NONE IDENTIFIED)

- OBSTACLE
- NON-LISTED OBSTACLE



0' 50' 100'
SCALE OF FEET
VERTICAL SCALE 1"=50'

RUNWAY 35 PROFILE VIEW

0' 500' 1000'
SCALE OF FEET
HORIZONTAL SCALE 1"=500'

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BEND OFFICE
1020 SW EMKAY DRIVE
SUITE #100
BEND, OR 97702
541.322.8962 OFFICE

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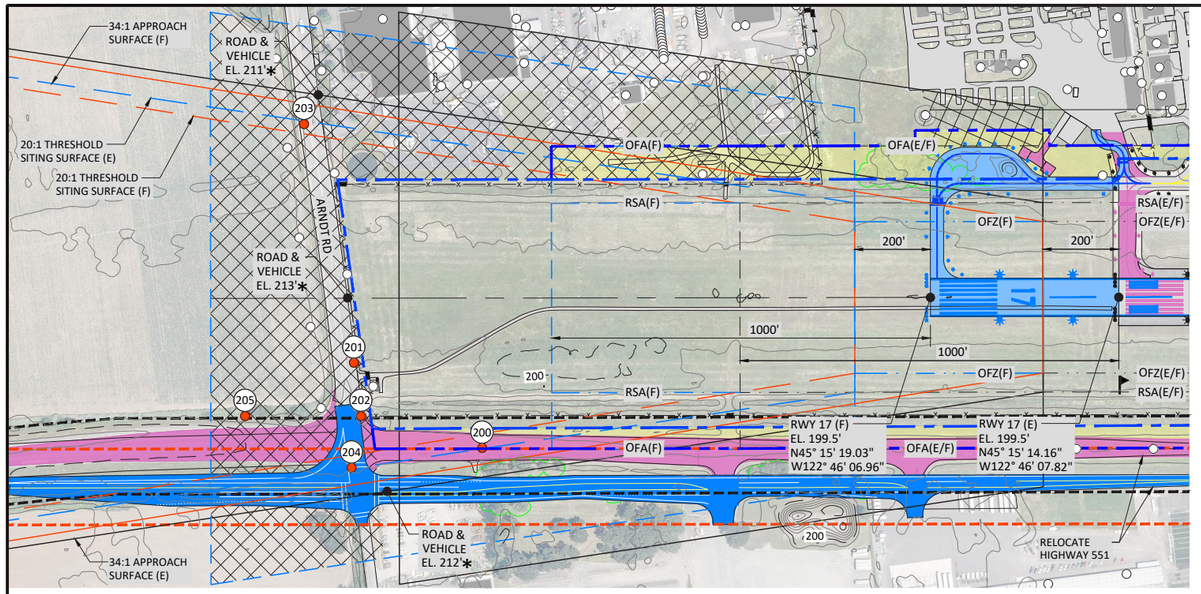
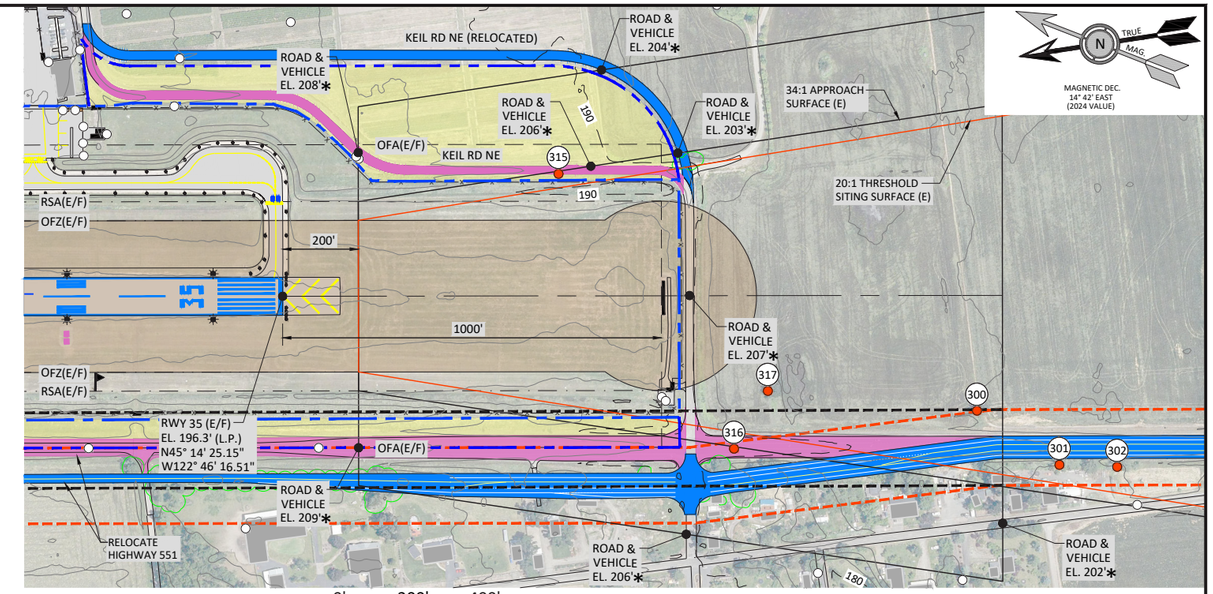
AURORA STATE AIRPORT

RUNWAY 35 PLAN & PROFILE

FIGURE NO.

SHEET NO. 7 OF 17





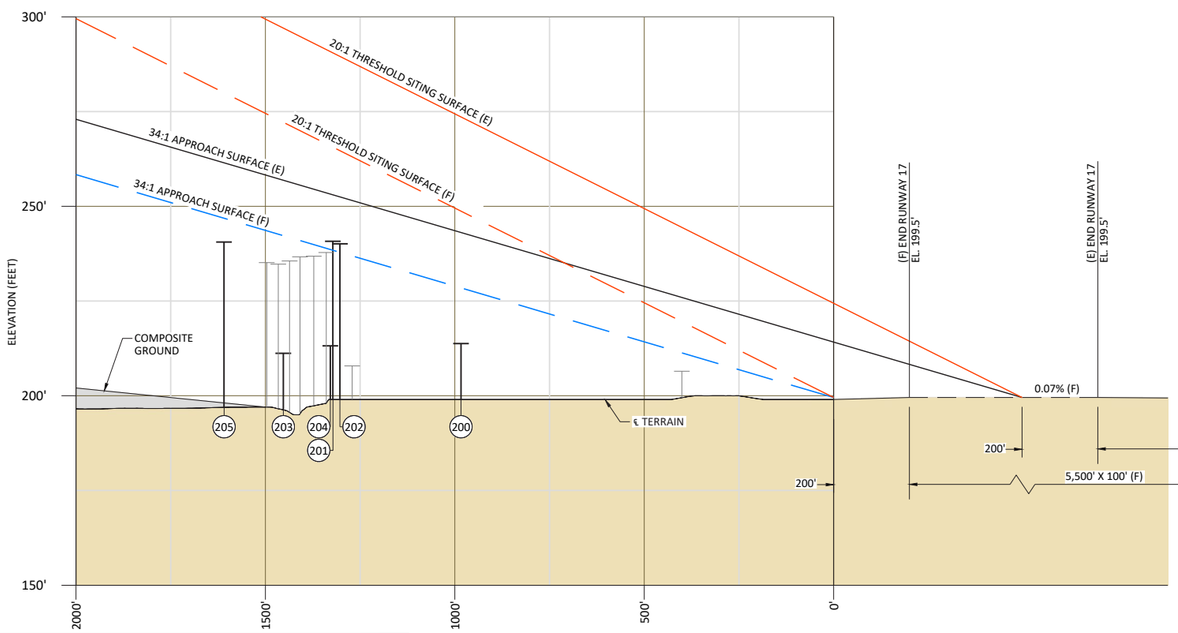
* ELEVATION INCLUDES GROUND ELEVATION PLUS 15' VEHICLE HEIGHT.

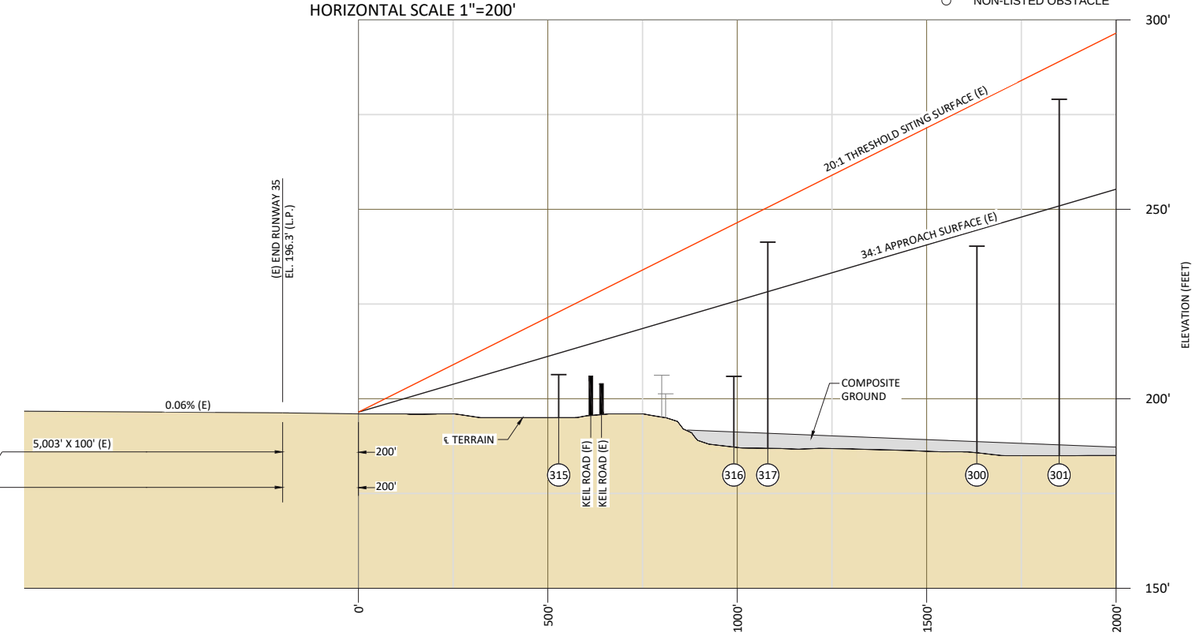
RUNWAY 17-35 PLAN VIEW

0' 200' 400'
SCALE OF FEET
HORIZONTAL SCALE 1"=200'

LEGEND

- OBSTACLE
- NON-LISTED OBSTACLE





RUNWAY 17-35 PROFILE VIEW

0' 20' 40'
SCALE OF FEET
VERTICAL SCALE 1"=20'

0' 200' 400'
SCALE OF FEET
HORIZONTAL SCALE 1"=200'

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NOTES:

1. SEE SHEETS 15, 16 AND 17 FOR OBSTRUCTION TABLES.
2. AGIS SURVEY - 2022, PROVIDED RUNWAY END COORDINATES AND ELEVATIONS.
3. SEE SHEET 3 FOR FULL LEGEND.

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APPROVAL DATE: _____
SIGNATURE

CENTURY WEST ENGINEERING
BEND OFFICE
1020 SW EMKAY DRIVE
SUITE #100
BEND, OR 97702
541.322.8962 OFFICE

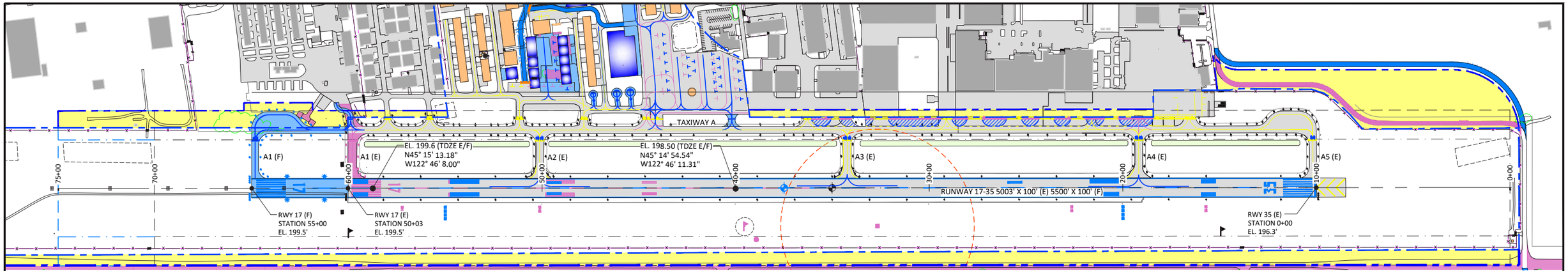
DESIGNED BY: JLS	DRAWN BY: JLS	CHECKED BY: DM	SCALE: AS SHOWN
DATE: MAY 2025		PROJECT NO: 40097.106.01	

AURORA STATE AIRPORT

INNER PORTION RUNWAY 17-35 APPROACH SURFACES

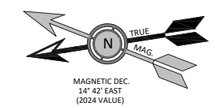
FIGURE NO.

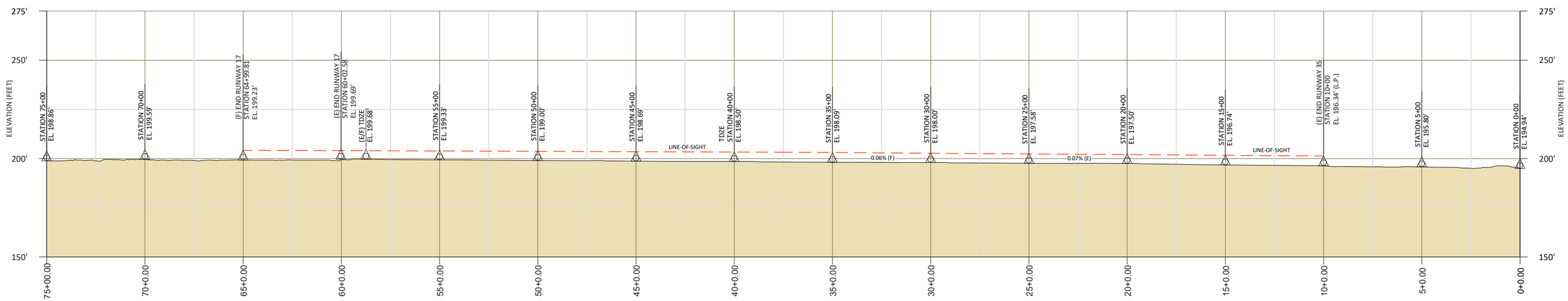
SHEET NO. 8 OF 17



RUNWAY 17-35 PLAN VIEW

0' 250' 500'
SCALE 1"=250'





0' 25' 50'
SCALE OF FEET
VERTICAL SCALE 1"=20'

RUNWAY 17-35 PROFILE VIEW

0' 250' 500'
SCALE OF FEET
HORIZONTAL SCALE 1"=250'

DRAFT

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NOTE:

1. SEE SHEET 3 FOR FULL LEGEND

NO.	DATE	BY	APPR	REVISIONS

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0" 1"
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APPROVAL DATE: _____
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OREGON DEPARTMENT OF AVIATION APPROVAL
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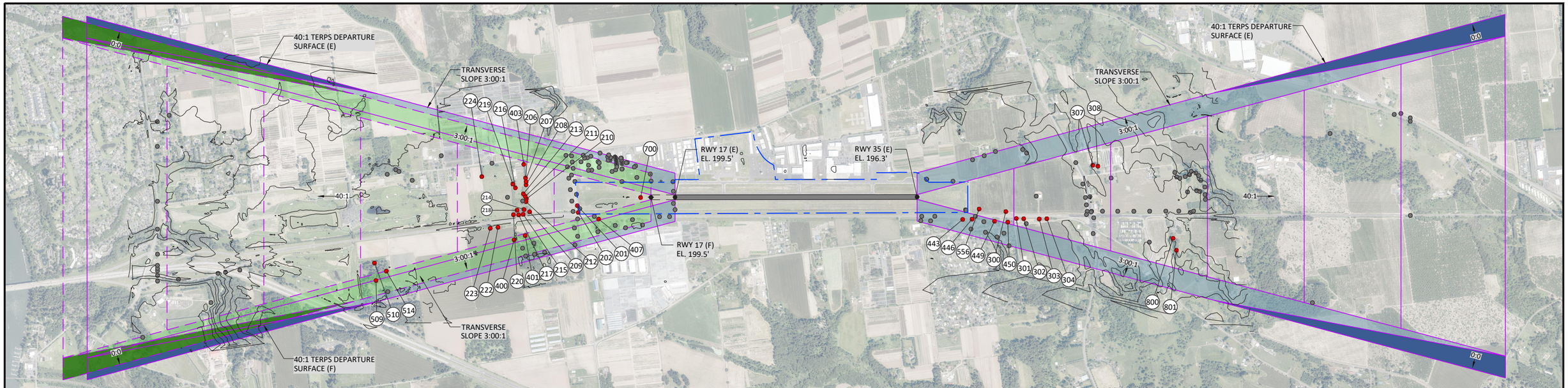
DESIGNED BY:	DRAWN BY:	CHECKED BY:	SCALE:
JLS	JLS	DM	AS SHOWN
DATE: MAY 2025		PROJECT NO: 40097.106.01	

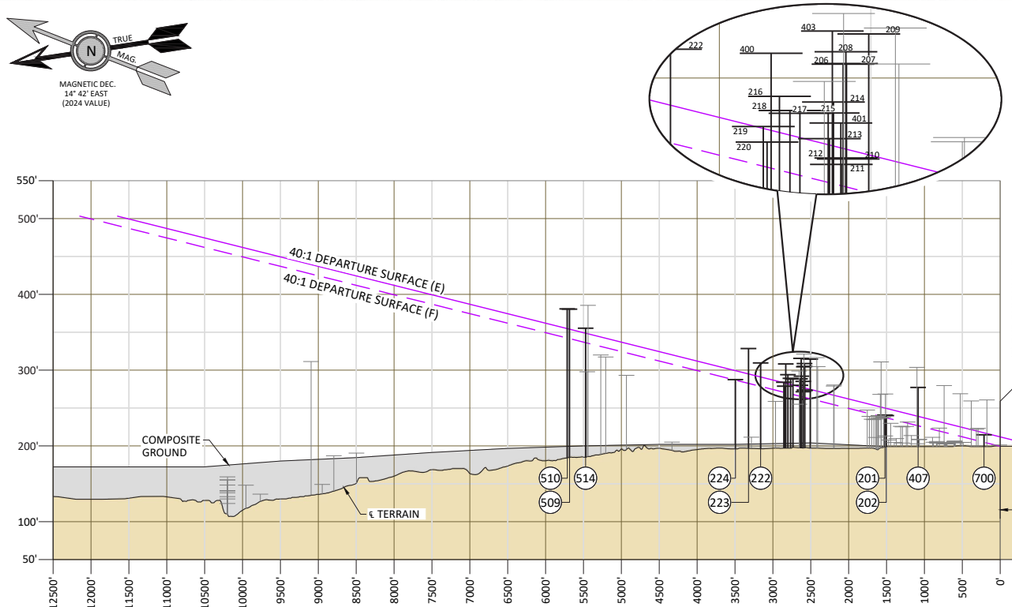
AURORA STATE AIRPORT

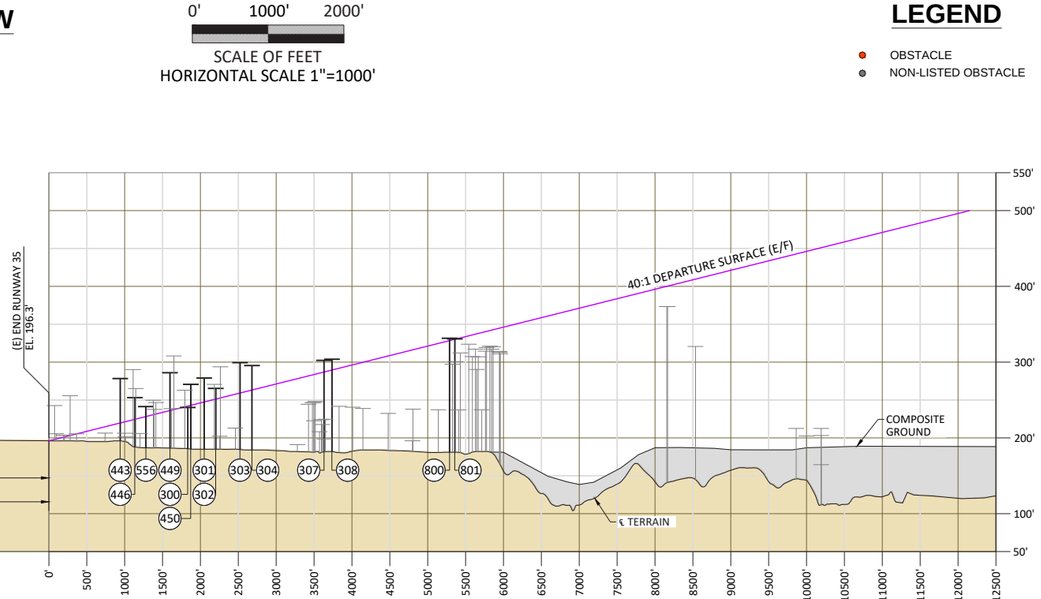
RUNWAY 17-35 CENTERLINE PROFILE

FIGURE NO.

SHEET NO.
9 OF 17







RUNWAY 17-35 PLAN VIEW

0' 1000' 2000'
SCALE OF FEET
HORIZONTAL SCALE 1"=1000'

LEGEND

- OBSTACLE
- NON-LISTED OBSTACLE

MAGNETIC DEC. 14° 42' EAST (2024 VALUE)

RUNWAY 17-35 PROFILE VIEW

0' 100' 200'
SCALE OF FEET
VERTICAL SCALE 1"=100'

0' 1000' 2000'
SCALE OF FEET
HORIZONTAL SCALE 1"=1000'

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DRAFT

NOTES:

1. SEE SHEETS 15, 16 AND 17 FOR OBSTRUCTION TABLES.
2. AGIS SURVEY - 2022, PROVIDED RUNWAY END COORDINATES AND ELEVATIONS.
3. INSTRUMENT DEPARTURE SURFACE PER FAA AC 150/5300-13B (TABLE 3-5).

NO.	DATE	BY	APPR	REVISIONS

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DATE: MAY 2025		PROJECT NO: 40097.106.01	

AURORA STATE AIRPORT

RUNWAY 17-35 INSTRUMENT DEPARTURE SURFACES

FIGURE NO.

SHEET NO. 10 OF 17

ON AIRPORT LAND USE

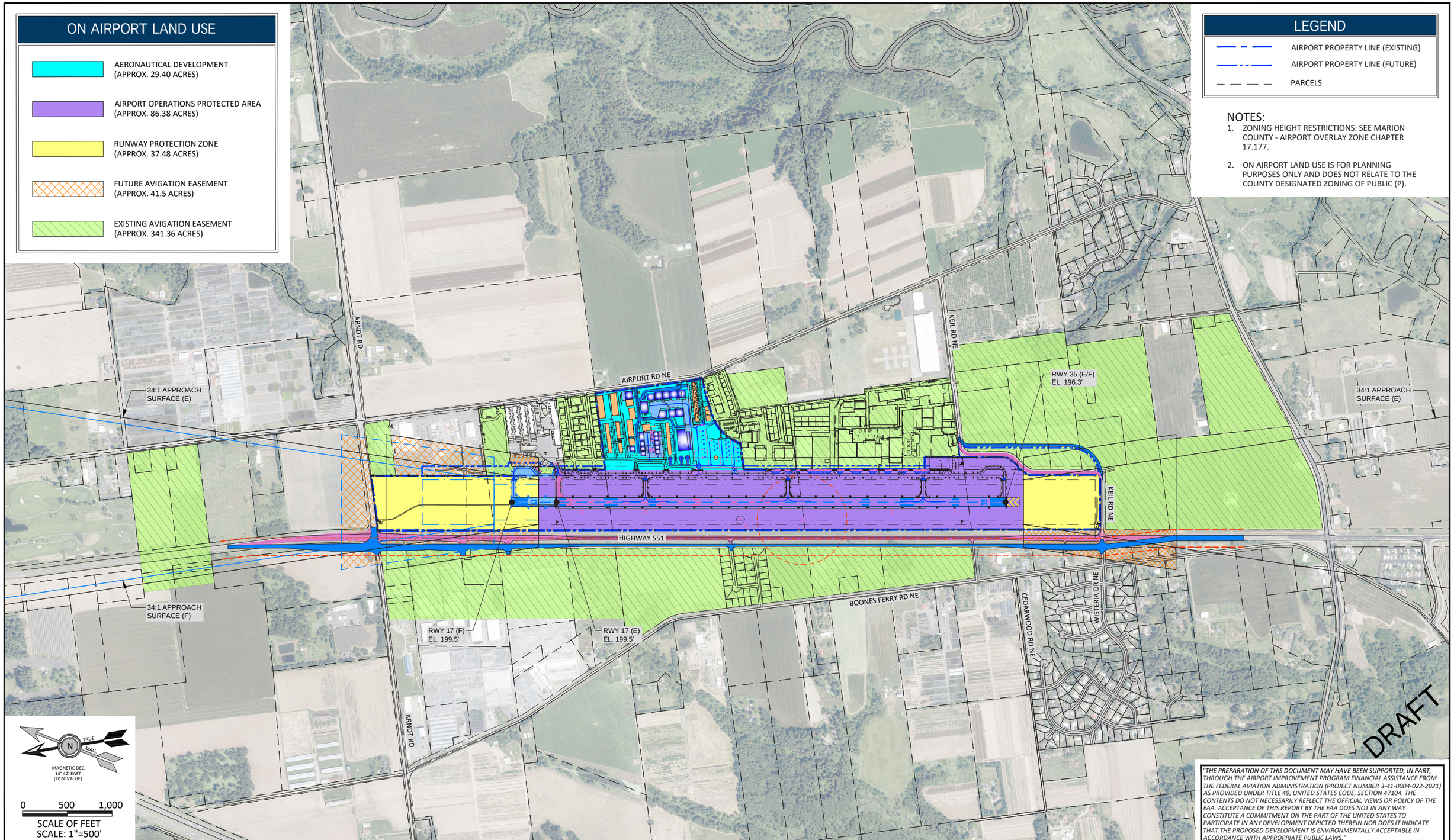
- AERONAUTICAL DEVELOPMENT (APPROX. 29.40 ACRES)
- AIRPORT OPERATIONS PROTECTED AREA (APPROX. 86.38 ACRES)
- RUNWAY PROTECTION ZONE (APPROX. 37.48 ACRES)
- FUTURE AVIGATION EASEMENT (APPROX. 41.5 ACRES)
- EXISTING AVIGATION EASEMENT (APPROX. 341.36 ACRES)

LEGEND

- AIRPORT PROPERTY LINE (EXISTING)
- AIRPORT PROPERTY LINE (FUTURE)
- PARCELS

NOTES:

1. ZONING HEIGHT RESTRICTIONS: SEE MARION COUNTY - AIRPORT OVERLAY ZONE CHAPTER 17.177.
2. ON AIRPORT LAND USE IS FOR PLANNING PURPOSES ONLY AND DOES NOT RELATE TO THE COUNTY DESIGNATED ZONING OF PUBLIC (P).



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APPROVAL DATE: _____

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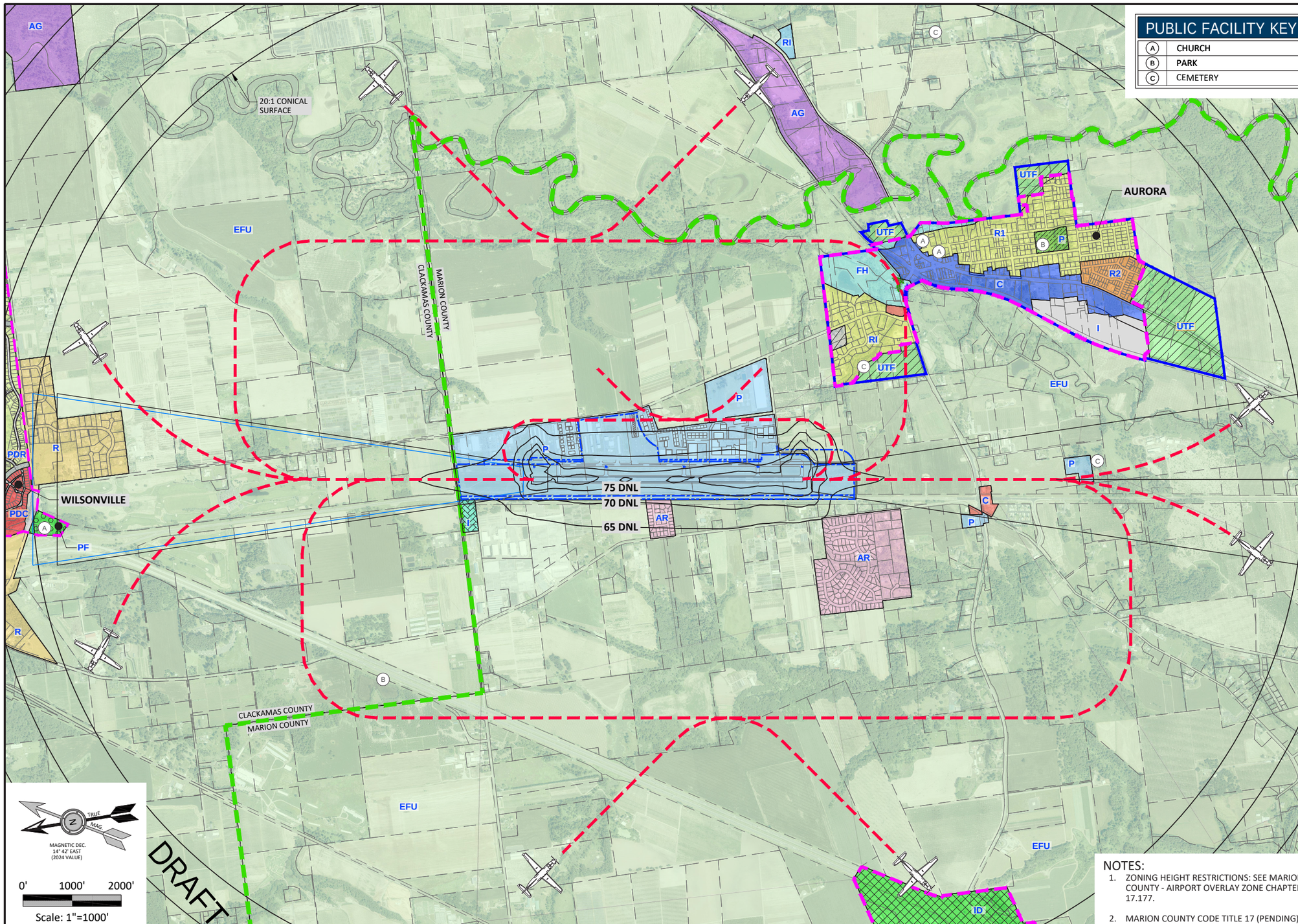
DATE: MAY 2025		PROJECT NO: 40097.106.01	

AURORA STATE AIRPORT

ON AIRPORT LAND USE PLAN

FIGURE NO.

SHEET NO. 11 OF 17



PUBLIC FACILITY KEY

A	CHURCH
B	PARK
C	CEMETERY

MARION COUNTY ZONING

- P - PUBLIC
- C - COMMERCIAL OFFICE
- I - INDUSTRIAL
- AR - ACREAGE RESIDENTIAL
- EFU - EXCLUSIVE FARM USE
- ID - INTERCHANGE DISTRICT

CLACKAMAS COUNTY ZONING

- R - RURAL
- AG - AGRICULTURAL
- RI - RURAL INDUSTRIAL

CITY OF AURORA ZONING

- FH - FLOOD HAZARD
- UTF - URBAN TRANSITION FARM
- R1 - LOW-DENSITY RESIDENTIAL
- R2 - MEDIUM-DENSITY RESIDENTIAL
- CITY PARKS
- C - COMMERCIAL
- I - INDUSTRIAL

CITY OF WILSONVILLE ZONING

- PF - PUBLIC FACILITY
- PDC - PLANNED DEVELOPMENT COMMERCIAL
- PF - PUBLIC FACILITY

LEGEND

- EXISTING AIRPORT PROPERTY LINE
- FUTURE AIRPORT PROPERTY LINE
- URBAN GROWTH BOUNDARY
- COUNTY BOUNDARY
- CITY LIMITS
- ZONING BOUNDARY
- AIRPORT TRAFFIC PATTERN (TYP.)
- PARCELS
- EXISTING APPROACH SURFACE
- FUTURE APPROACH SURFACE

NOTES:

1. ZONING HEIGHT RESTRICTIONS: SEE MARION COUNTY - AIRPORT OVERLAY ZONE CHAPTER 17.177.
2. MARION COUNTY CODE TITLE 17 (PENDING).

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SIGNATURE

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1020 SW EMKAY DRIVE
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BEND, OR 97702
541.322.8962 OFFICE

DESIGNED BY:	DRAWN BY:	CHECKED BY:	SCALE:
JLS	JLS	DM	AS SHOWN
DATE: MAY 2025		PROJECT NO: 40097.106.01	

AURORA STATE AIRPORT

OFF AIRPORT LAND USE PLAN WITH 2041 NOISE CONTOURS

FIGURE NO.

SHEET NO. 12 OF 17

PROPERTY ACQUIRED UNDER FEDERAL AID PROJECTS

PARCEL	DATE	RECORDING INFORMATION VOL., PAGE	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 & MERLEA LEFFLER	ADAP 3-41-0056-01
H *	12-30-42	3213B, BOOK 279, PAGE 43	EASEMENT	AVIGATION	IRVIN & MERLEA LEFFLER	ADAP 3-41-0056-01
J *	12-31-42	10644, BOOK 279, PAGE 88	EASEMENT	AVIGATION	IRVIN & MERLEA LEFFLER	ADAP 3-41-0056-01
K *	12-30-42	3212A, BOOK 279, PAGE 46	EASEMENT	AVIGATION	IRVIN & MERLEA 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
O *	04-02-43	3218B, BOOK 282, PAGE 121	EASEMENT	AVIGATION	WILLIAM & EDNA 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

PARCEL	DATE	RECORDING INFORMATION VOL., PAGE	INTEREST ACQUIRED	EASEMENT TYPE	PREVIOUS OWNER	LAND AQUISITION
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	IRVAN & 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	AIP 3-41-0004-12
V (111)	08-13-07	REEL 2857, PAGE 77	FEE	OWNERSHIP	LLOYD B JANZEN/JOHN WESSMAN	AIP 3-41-0004-12
W (112)	08-13-07	REEL 2857, PAGE 416	FEE	OWNERSHIP	VERA L BENNETT	AIP 3-41-0004-12
X (113A)	08-27-07	REEL 2859, PAGE 302	FEE	OWNERSHIP	TLM HOLDINGS, LLC	AIP 3-41-0004-12
Y (113B)	08-27-07	REEL 2859, PAGE 302	FEE	OWNERSHIP	TLM HOLDINGS, LLC	AIP 3-41-0004-12
Z (113C)	08-27-07	REEL 2859, PAGE 302	FEE	OWNERSHIP	TLM HOLDINGS, LLC	AIP 3-41-0004-12
(26)[a]	1993		FEE	OWNERSHIP	STATE OF OREGON DOT	AIP 3-41-0004-003
(29)[b]	1993		FEE	OWNERSHIP	STATE OF OREGON DOT	AIP 3-41-0004-003
(14)[c]	1985		FEE	OWNERSHIP	STATE OF OREGON DOT	AIP 3-41-0004-001

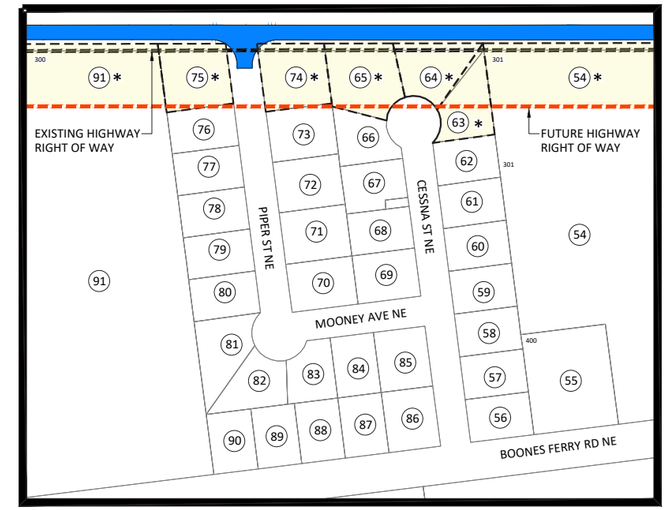
a - GRANT PARCEL A b - GRANT PARCEL B C - GRANT PARCEL C

PROPERTY TO BE ACQUIRED

AREA	CURRENT OWNERSHIP	APPROXIMATE AREA	AREA	CURRENT OWNERSHIP	APPROXIMATE AREA
(8)	CATALINA WM LLC C/O COLUMBIA HELICOPTERS INC	19.24	(22)	US LEASECO INC	27.47
(9)	TRI-PROP LLC	6.20	(23)	VANS REAL ESTATE LLC	4.53
(10)	OREGON DEPARTMENT OF AVIATION	9.86	(24)	TLM HOLDINGS LLC	6.51
(16)	MERIDIAN AIRPARK CONDOMINIUM	3.71	(25)	TLM HOLDINGS LLC	N/A
(17)	BLUE SKY AURORA LLC	1.07	(27)	ALAMILLA LOGISTICS LLC	3.07
(18)	BENNETT FAM. TR.	.95	(28)	M & H FARMS LLC	9.51
(19)	AIRPARK AVIATION CONDO ASSOCIATION	3.89	(31)	MISSING OWNERSHIP INFORMATION	8.86
(20)	TLM HOLDINGS LLC	5.12	(115)	BASIL KELLEY	6.75
(21)	TLM HOLDINGS LLC	11.42	(116)	BASIL KELLEY	8.32

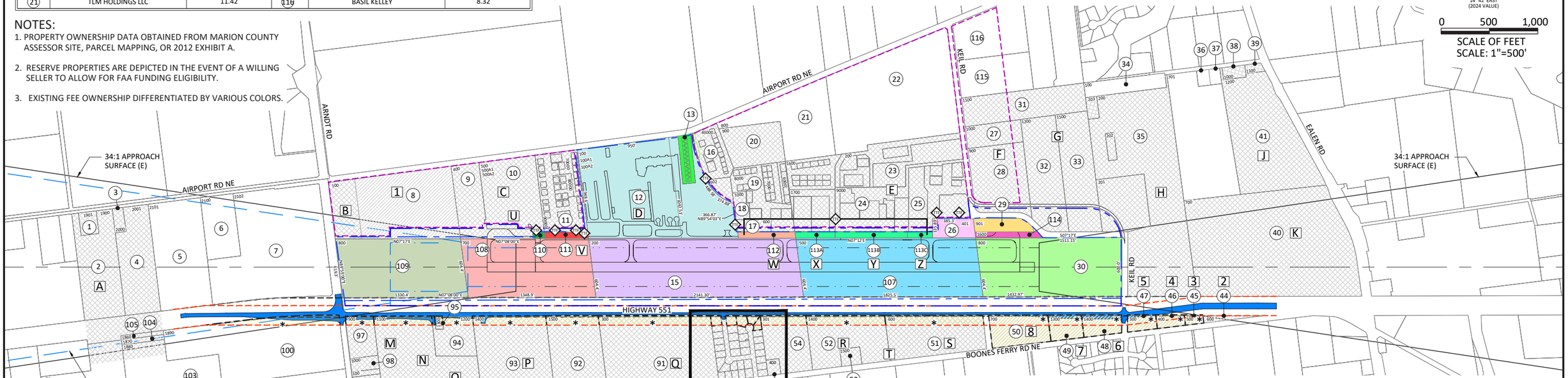
EASEMENTS TO BE ACQUIRED

AREA	CURRENT OWNERSHIP	APPROXIMATE AREA	AREA	CURRENT OWNERSHIP	APPROXIMATE AREA
1	COLUMBIA HELICOPTERS INC	15.86 ACRES	5	ZENAIDA MENDEZ & ISRAEL VILLALOBOS	1.05 ACRES
2	JASON & SARAH FARRENS	0.60 ACRES	6	CHRISTIAN GAGE	1.92 ACRES
3	SHELLIE VEDACK	0.52 ACRES	7	TERYL PIERCE	2.00 ACRES
4	ELEASIB & LETICIA CERVANTES	1.00 ACRES	8	DEANNA LINETTE DOBBINS	5.03 ACRES



DETAIL A

NOTES:
1. PROPERTY OWNERSHIP DATA OBTAINED FROM MARION COUNTY ASSESSOR SITE, PARCEL MAPPING, OR 2012 EXHIBIT A.
2. RESERVE PROPERTIES ARE DEPICTED IN THE EVENT OF A WILLING SELLER TO ALLOW FOR FAA FUNDING ELIGIBILITY.
3. EXISTING FEE OWNERSHIP DIFFERENTIATED BY VARIOUS COLORS.



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DRAFT

LEGEND

- EXISTING AIRPORT PROPERTY LINE
- FUTURE AIRPORT PROPERTY LINE
- PARCEL BOUNDARY
- EXISTING APPROACH SURFACE
- FUTURE APPROACH SURFACE
- PARCEL OWNERSHIP IDENTIFICATION #
- TAX LOT NUMBER
- RELOCATED HIGHWAY
- THROUGH THE FENCE ACCESS POINTS
- EXISTING HIGHWAY RIGHT OF WAY
- FUTURE HIGHWAY RIGHT OF WAY
- RESERVE AIRPORT PROPERTY ACQ. (SEE NOTE 2)
- EXISTING FEE OWNERSHIP (SEE NOTE 3)
- EXISTING AVIGATION EASEMENT
- EASEMENT TO BE AQUIRED
- PROPERTY ACQUISITION BASED ON PROPOSED SHIFT OF HWY 551 ROW

NO.	DATE	BY	APPR	REVISIONS

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DATE: MAY 2025		PROJECT NO: 40097.106.01	

AURORA STATE AIRPORT

EXHIBIT A - AIRPORT PROPERTY PLAN

FIGURE NO.

SHEET NO. 13 OF 17

PARCEL OWNERSHIP DATA

PARCEL	ACRES	OWNER	RECORDING INFORMATION	COUNTY	MAP AND TAX LOT NUMBERS
1	1.01	WILBUR WEST	N/A	CLACKAMAS	MAP 3-1W-45 T.L. # 1901
2	9.75	EXIT 282A DEVELOPMENT CO LLC	N/A	CLACKAMAS	MAP 3-1W-35 T.L. #1900
3	0.65	EXIT 282A DEVELOPMENT CO LLC	N/A	CLACKAMAS	MAP 3-1W-35 T.L. #2000
4	8.83	EXIT 282A DEVELOPMENT CO LLC	N/A	CLACKAMAS	MAP 3-1W-35 T.L. #2001
5	13.81	EXIT 282A DEVELOPMENT CO LLC	N/A	CLACKAMAS	MAP 3-1W-351 T.L. #2101
6	5.12	AURORA LAND COMPANY LLC	N/A	CLACKAMAS	MAP 3-1W-35 T.L. #2100
7	26.95	EXIT 282A DEVELOPMENT CO LLC	N/A	CLACKAMAS	MAP 3-1W-35 T.L. #2102
8	19.24	CATALINA WM LLC C/O COLUMBIA HELICOPTERS INC	BK. 4293, PG. 144	MARION	MAP 4-1W-02A T.L. #100
9	6.20	TRI-PROP LLC	BK. 3181, PG. 424	MARION	MAP 4-1W-02A T.L. #400
10	9.86	OREGON DEPARTMENT OF AVIATION	BK. E2857, PG.98	MARION	MAP 4-1W-02A T.L. #500
11	8.43	WYLEE HANGAR CONDOMINIUM ASSOCIATION	BK. 2972, PG. 481	MARION	MAP 4-1W-02A T.L. #70000,80000,90000
12	30.01	STATE OF OREGON	BK. 458, PG. 411	MARION	MAP 4-1W-02D T.L. #100
13	1.50	STATE OF OREGON - AVIATION	N/A	MARION	MAP 4-1W-02D T.L. #9000 - TO #90021
14	NOT USED				
15	29.49	STATE OF OREGON - AVIATION	BK.747, PG. 568	MARION	MAP 4-1W-02D T.L. #200
16	3.71	MERIDIAN AIRPARK CONDOMINIUM ROGER M. STENBOCK JOHN CHLOPEK PETER LAFRANCHISE	N/A	MARION	MAP 4-1W-02D T.L. #40000
17	1.07	BLUE SKY AURORA LLC	BK. 2882, PG. 279	MARION	MAP 4-1W-02D T.L. #600
18	.95	BENNETT FAM. TR.	BK. 4632, PG. 40	MARION	MAP 4-1W-02D T.L. #1000
19	3.89	AIRPARK AVIATION CONDO ASSOCIATION	BK. 1387, PG. 227	MARION	MAP 4-1W-02D T.L. #8000
20	5.12	TLM HOLDINGS LLC	BK. 3708, PG. 318	MARION	MAP 4-1W-02D T.L. #900
21	11.42	TLM HOLDINGS LLC	BK. 3708, PG. 318	MARION	MAP 4-1W-02D T.L. #800
22	27.47	US LEASECO INC	BK. 2969 PG. 285	MARION	MAP 4-1W-11A T.L. #100
23	4.53	VANS REAL ESTATE LLC	BK. 4525 PG. 425	MARION	MAP 4-1W-11A T.L. #200
24	6.51	TLM HOLDINGS LLC	N/A	MARION	MAP 4-1W-11A T.L. #9000
25	3.03	TLM HOLDINGS LLC	N/A	MARION	MAP 4-1W-11A T.L. #400
26	1.82	STATE OF OREGON - AVIATION	BK. 868 PG. 298	MARION	MAP 4-1W-11A T.L. #401
27	3.07	ALAMILLA LOGISTICS LLC	N/A	MARION	MAP 4-1W-11A T.L. #1000
28	9.51	M & H FARMS LLC	BK. 2257, PG. 328	MARION	MAP 4-1W-11A T.L. #900
29	1.85	STATE OF OREGON - DOT	BK. 1193 PG. 750	MARION	MAP 4-1W-11A T.L. #901
30	17.76	STATE OF OREGON - AVIATION	BK. 747 PG. 568	MARION	MAP 4-1W-11A T.L. #800
31	8.86	MISSING OWNERSHIP INFORMATION	BK. 108 PG. 1251	MARION	MAP 4-1W-11A T.L. #1100
32	9.65	M & H FARMS LLC	BK. 2257 PG. 328	MARION	MAP 4-1W-11A T.L. #1200
33	9.91	M & H FARMS LLC	BK. 2257 PG. 328	MARION	MAP 4-1W-11A T.L. #1500
34	3.01	DEAN SCOTT	BK. 4642 PG. 415	MARION	MAP 4-1W-11D T.L. #100
35	32.71	WILLIAM JENKS	BK. E1655 PG. 670	MARION	MAP 4-1W-11D T.L. #200
36	0.47	INGALLIS ROAD LLC	BK. 4548 PG. 242	MARION	MAP 4-1W-11D T.L. #800
37	0.44	INGALLIS ROAD LLC	BK. 4548, PG. 238	MARION	MAP 4-1W-11D T.L. #900
38	0.69	CAROL SULLIVAN	BK. 3628, PG. 451	MARION	MAP 4-1W-11D T.L. #1000
39	0.39	LEXEE PADRICK	BK 4525, PG. 107	MARION	MAP 4-1W-11D T.L. #1100
40	40.38	BUCK DAVID	BK. 45750, PG. 27	MARION	MAP 4-1W-11D T.L. #700
41	18.42	BOB JONAS	BK. 4563, PG. 334	MARION	MAP 4-1W-11D T.L. #1200
44	0.60	JASON AND SARAH FERRENS	BK. 2427, PG. 204	MARION	MAP 4-1W-11D T.L. #600
45	0.52	SHELLIE VEDACK	BK. 3814, PG. 376	MARION	MAP 4-1W-11D T.L. #500
46	1.00	ELEASIB AND LETICIA CERVANTES	BK. 3570, PG. 58	MARION	MAP 4-1W-11D T.L. #400
47	1.05	ZENAIDA MENDEZ & ISRAEL VILLALOBOS	BK. 2605, PG. 105	MARION	MAP 4-1W-11D T.L. #300
48	1.92	CHRISTIAN GAGE	BK. 4653, PG. 476	MARION	MAP 4-1W-11A T.L. #1400
49	2.00	TERYL PIERCE	BK. 4145, PG. 220	MARION	MAP 4-1W-11A T.L. #1300
50	5.03	DEANNA LINETTE DOBBINS	BK. 4369, PG. 468	MARION	MAP 4-1W-11A T.L. #700
51	10.02	DANIEL MCGUIRE	BK. 4671, PG. 102	MARION	MAP 4-1W-11A T.L. #600
52	9.50	BULLFROG PROPERTIES LLC	BK. 3894, PG. 335	MARION	MAP 4-1W-02D T.L. #1400
53	1.00	RITO & LORENA SANCHEZ	BK. 3386, PG. 397	MARION	MAP 4-1W-02D T.L. #1500
54	5.95	FREDERICK & ROYLYNN KAHLE	BK. 2217, PG. 363	MARION	MAP 4-1W-02D T.L. #301
55	0.59	FREDERICK & ROYLYNN KAHLE	BK. 2443, PG. 251	MARION	MAP 4-1W-02D T.L. #400

PARCEL OWNERSHIP DATA

PARCEL	ACRES	OWNER	RECORDING INFORMATION	COUNTY	MAP AND TAX LOT NUMBERS
56	SUNSET HAVEN LT.1 BK.1	SHIRLEE KOWASH	BK. 648, PG. 113	MARION	MAP 4-1W-02DC T.L. #3600
57	SUNSET HAVEN LT.2 BK.1	JOHN & JO ANNA LARUE	BK. 1337, PG. 164	MARION	MAP 4-1W-02DC T.L. #3500
58	SUNSET HAVEN LT.3 BK.1	KEITH WAYNE WRIGHT	BK. 4116, PG. 42	MARION	MAP 4-1W-02DC T.L. #3400
59	SUNSET HAVEN LT.4 BK.1	LINDA SCHILLING	BK. 3865, PG. 182	MARION	MAP 4-1W-02DC T.L. #3300
60	SUNSET HAVEN LT.5 BK.1	OMAR GUZMAN	N/A	MARION	MAP 4-1W-02DC T.L. #3200
61	SUNSET HAVEN LT.6 BK.1	IVETTE RENDON MAYARES	N/A	MARION	MAP 4-1W-02DC T.L. #3100
62	SUNSET HAVEN LT.7 BK.1	ALBERT VALLEE JR RLT	BK. 4685, PG. 91	MARION	MAP 4-1W-02DC T.L. #3000
63	SUNSET HAVEN LT.8 BK.1	CARLOS & JOSE NEGRETE	BK. 3873, PG. 174	MARION	MAP 4-1W-02DC T.L. #2900
64	SUNSET HAVEN LT.9 BK.1	OSCAR RUIZ CONTRERAS	N/A	MARION	MAP 4-1W-02DC T.L. #2800
65	SUNSET HAVEN LT.10 BK.1	NORMA L MCATEE	BK. 1543, PG. 187	MARION	MAP 4-1W-02DC T.L. #2700
66	SUNSET HAVEN LT.11 BK.1.	ENRIQUE SALAZAR & SILVIANA SANTOS	BK. 4252, PG. 422	MARION	MAP 4-1W-02DC T.L. #2400
67	SUNSET HAVEN LT.12 BK.1.	GAYLE KIRKPATRICK	BK. 319, PG. 1006	MARION	MAP 4-1W-02DC T.L. #2200
68	SUNSET HAVEN LT.13 BK.1	ERASMO CARRILLO	N/A	MARION	MAP 4-1W-02DC T.L. #1900
69	SUNSET HAVEN LT.14 BK.1	EUNICE PRICE	BK. 3349, PG. 118	MARION	MAP 4-1W-02DC T.L. #1800
70	SUNSET HAVEN LT.15 BK.1	VERNE POWELL	BK. 3199, PG. 10	MARION	MAP 4-1W-02DC T.L. #1700
71	SUNSET HAVEN LT.16 BK.1	JAMIE EUBANKS	N/A	MARION	MAP 4-1W-02DC T.L. #2000
72	SUNSET HAVEN LT.17 BK.1	TERRY GERMAN	BK. 3614, PG. 160	MARION	MAP 4-1W-02DC T.L. #2100
73	SUNSET HAVEN LT.18 BK.1	JANET GRIFFIN	BK. 2492, PG. 87	MARION	MAP 4-1W-02DC T.L. #2500
74	SUNSET HAVEN LT.19 BK.1	LORAINE DEES	BK. 1568, PG. 286	MARION	MAP 4-1W-02DC T.L. #2600
75	SUNSET HAVEN LT. 16 BK. 2	JORGE ANTONIO DOMINGUEZ ORTIZ	BK. 44, PG. 101	MARION	MAP 4-1W-02DC T.L. #100
76	SUNSET HAVEN LT. 15 BK. 2	SERAFIN SANCHEZ	BK. 3788, PG. 123	MARION	MAP 4-1W-02DC T.L. #200
77	SUNSET HAVEN LT. 14 BK. 2	PEDRO CASTREJON MARTINEZ	N/A	MARION	MAP 4-1W-02DC T.L. #300
78	SUNSET HAVEN LT. 13 BK. 2	MIRANDA WARDRIP	BK. 4279, PG. 461	MARION	MAP 4-1W-02DC T.L. #400
79	SUNSET HAVEN LT. 12 BK. 2	ANDREA CARREON	BK. 4345, PG. 495	MARION	MAP 4-1W-02DC T.L. #500
80	SUNSET HAVEN LT. 11 BK. 2	JONG CHOI	BK. 4470, PG. 426	MARION	MAP 4-1W-02DC T.L. #600
81	SUNSET HAVEN LT. 10 BK. 2	FRANK LARSEN	BK. 208, PG. 190	MARION	MAP 4-1W-02DC T.L. #700
82	SUNSET HAVEN LT. 9 BK. 2	GENE ROCHA	BK. 3574, PG. 420	MARION	MAP 4-1W-02DC T.L. #800
83	SUNSET HAVEN LT. 8 BK. 2	RANDE DIESTLER	BK. 3811, PG. 126	MARION	MAP 4-1W-02DC T.L. #1600
84	SUNSET HAVEN LT. 7 BK. 2	DAVID & SHANNON E. GIBB	BK. 1003, PG. 354	MARION	MAP 4-1W-02DC T.L. #1500
85	SUNSET HAVEN LT. 6 BK. 2	HILARIO GOMEZ TELLO	BK. 4416, PG. 161	MARION	MAP 4-1W-02DC T.L. #1400
86	SUNSET HAVEN LT. 5 BK. 2	SAMANTHA BOICE & BRIAN KEITH	BK. 3966, PG. 498	MARION	MAP 4-1W-02DC T.L. #1300
87	SUNSET HAVEN LT. 4 BK. 2	RONALD W. ROBINSON	BK. 3150, PG. 100	MARION	MAP 4-1W-02DC T.L. #1200
88	SUNSET HAVEN LT. 3 BK. 2	FREDERICK & ROYLYNN KAHLE	BK. 2217, PG. 365	MARION	MAP 4-1W-02DC T.L. #1100
89	SUNSET HAVEN LT. 2 BK. 2	ROBERT ZAKIAN	BK. 3744, PG. 352	MARION	MAP 4-1W-02DC T.L. #1000
90	SUNSET HAVEN LT. 1 BK. 2	TERRELL FAM. LT.	BK. 3866, PG. 442	MARION	MAP 4-1W-02DC T.L. #900
91	22.33	FREDERICK & ROYLYNN KAHLE	BK. 801, PG. 230	MARION	MAP 4-1W-02D T.L. #300
92	15.12	SMITH AURORA LLC	BK. 4076, PG. 182	MARION	MAP 4-1W-02A T.L. #1500
93	15.00	SMITH AURORA LLC	BK. 3722, PG. 350	MARION	MAP 4-1W-02A T.L. #1400
94	3.77	M T A HOLDINGS LLC	BK. 1637, PG. 136	MARION	MAP 4-1W-02A T.L. #1200
95	0.23	M T A HOLDINGS LLC	BK. 1637, PG. 136	MARION	MAP 4-1W-02A T.L. #1300
96	22.20	M T A HOLDINGS LLC	BK. 1637, PG. 136	MARION	MAP 4-1W-02A T.L. #1100
97	2.72	LVB LLC - LOREN W. BOECKMAN	BK. 2968, PG.120	MARION	MAP 4-1W-02A T.L. #900
98	0.89	LVB LLC - LOREN W. BOECKMAN	BK. 240, PG. 287	MARION	MAP 4-1W-02A T.L. #1000
100	21.77	EXIT 282A DEVELOPMENT CO LLC	N/A	CLACKAMAS	MAP 3-1W-35 T.L. #1890
101	19.97	RMJ PROPERTIES LLC	N/A	CLACKAMAS	MAP 3-1W-35 T.L. #1801
103	63.86	EXIT 282A DEVELOPMENT CO LLC	N/A	CLACKAMAS	MAP 3-1W-35 T.L. #1802
104	0.51	EXIT 282A DEVELOPMENT CO LLC	N/A	CLACKAMAS	MAP 3-1W-35 T.L. #1870
105	0.52	EXIT 282A DEVELOPMENT CO LLC	N/A	CLACKAMAS	MAP 3-1W-35 T.L. #1860
106	21.91	EXIT 282A DEVELOPMENT CO LLC	N/A	CLACKAMAS	MAP 3-1W-35 T.L. #570
107	25.11	STATE OF OREGON - AVIATION	BK. 482, PG. 653	MARION	MAP 4-1W-011A T.L. #500
108	18.08	STATE OF OREGON - AVIATION	BK. 482, PG. 653	MARION	MAP 4-1W-02A T.L. #700
109	17.76	STATE OF OREGON - AVIATION	BK.747, PG. 568	MARION	MAP 4-1W-02A T.L. #800
110	0.18	OREGON DEPARTMENT OF AVIATION	BK 2857, PG. 98	MARION	MAP 4-1W-02A T.L. #501
111	0.67	OREGON DEPARTMENT OF AVIATION	BK 2857, PG. 77	MARION	MAP 4-1W-02A T.L. #90016

PARCEL OWNERSHIP DATA

PARCEL	ACRES	OWNER	RECORDING INFORMATION	COUNTY	MAP AND TAX LOT NUMBERS
112	0.89	OREGON DEPARTMENT OF AVIATION	BK 2857, PG. 416	MARION	MAP 4-1W-02D T.L. #604
113A	0.62	STATE OF OREGON - AVIATION	BK 2859, PG. 302	MARION	MAP 4-1W-02D T.L. #1701
113B	1.12	STATE OF OREGON - AVIATION	BK 2859, PG. 302	MARION	MAP 4-1W-11A T.L. #404
113C	0.39	STATE OF OREGON - AVIATION	BK 2859, PG. 302	MARION	MAP 4-1W-11A T.L. #403
114	0.93	MARION COUNTY	BK 12, PG. 21	MARION	MAP 4-1W-11A T.L. #1600
115	6.75	BASIL KELLEY	BK 3649, PG. 493	MARION	MAP 4-1W-12B T.L. #500
116	8.32	BASIL KELLEY	BK 3649, PG. 493	MARION	MAP 4-1W-12B T.L. #800

LEGEND

EXISTING FEE OWNERSHIP (SEE NOTE 1)

PARCEL OWNERSHIP IDENTIFICATION # (#)

NOTE:
1. EXISTING FEE OWNERSHIP DIFFERENTIATED BY VARIOUS COLORS.

DRAFT

"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 3-41-0004-022-2021) 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."

NO.	DATE	BY	APPR	REVISIONS

VERIFY SCALES
BAR IS ONE INCH ON ORIGINAL DRAWING.
0" 1"
IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY.

FEDERAL AVIATION ADMINISTRATION APPROVAL
APPROVAL DATE: _____
SIGNATURE

OREGON DEPARTMENT OF AVIATION APPROVAL
APPROVAL DATE: _____
SIGNATURE

CENTURY WEST ENGINEERING
BEND OFFICE
1020 SW EMKAY DRIVE
SUITE #100
BEND, OR 97702
541.322.8962 OFFICE

DESIGNED BY: JLS | DRAWN BY: JLS | CHECKED BY: DM | SCALE: AS SHOWN
DATE: MAY 2025 | PROJECT NO: 40097.106.01

AURORA STATE AIRPORT

EXHIBIT A - DATA TABLES

FIGURE NO.

SHEET NO. 14 OF 17

PART 77 PRIMARY SURFACE OBSTRUCTIONS

OBSTACLE ID	DESCRIPTION	SURVEY DATE	SURFACE	GROUND ELEVATION (FT)	AGL (FT)	TOP HEIGHT (FT)	SURFACE HEIGHT (FT)	PENETRATION (FT)	DISPOSITION
101	NAVAID	6/23/2022	PRIMARY	197.0	4.7	201.7	199.5	2.2	FIXED BY FUNCTION
102	NAVAID	6/23/2022	PRIMARY	196.5	5.4	201.9	199.5	2.4	FIXED BY FUNCTION
103	SIGN	6/23/2022	PRIMARY	197.9	3.0	200.9	199.6	1.3	FIXED BY FUNCTION
104	NAVAID	6/23/2022	PRIMARY	197.2	4.0	201.2	199.5	1.7	FIXED BY FUNCTION
105	NAVAID	6/23/2022	PRIMARY	197.6	3.6	201.2	199.5	1.7	FIXED BY FUNCTION
106	SIGN	6/23/2022	PRIMARY	197.8	3.0	200.8	199.1	1.7	FIXED BY FUNCTION
107	NAVAID	6/23/2022	PRIMARY	196.8	3.5	200.3	199.1	1.2	FIXED BY FUNCTION
108	NAVAID	6/23/2022	PRIMARY	196.9	3.5	200.4	199.1	1.3	FIXED BY FUNCTION
109	SIGN	6/23/2022	PRIMARY	197.5	3.4	200.9	199.0	1.9	FIXED BY FUNCTION
110	SIGN	6/23/2022	PRIMARY	197.7	2.9	200.6	199.0	1.6	FIXED BY FUNCTION
111	SIGN	6/23/2022	PRIMARY	196.9	3.4	200.3	198.4	1.9	FIXED BY FUNCTION
112	WINDSOCK	6/23/2022	PRIMARY	195.2	20.2	215.4	198.4	17.0	FIXED BY FUNCTION
113	SIGN	6/23/2022	PRIMARY	196.7	2.5	199.2	198.1	1.1	FIXED BY FUNCTION
114	SIGN	6/23/2022	PRIMARY	196.9	2.9	199.8	198.1	1.7	FIXED BY FUNCTION
115	ANTENNA - ASOS	6/23/2022	PRIMARY	194.9	29.2	224.1	198.1	26.0	TO BE LIGHTED
116	NAVAID	6/23/2022	PRIMARY	195.4	10.4	205.8	198.1	7.7	FIXED BY FUNCTION
117	NAVAID	6/23/2022	PRIMARY	195.3	11.9	207.2	198.0	9.2	FIXED BY FUNCTION
118	SIGN	6/23/2022	PRIMARY	196.8	3.2	200.0	197.9	2.1	FIXED BY FUNCTION
119	NAVAID	6/23/2022	PRIMARY	194.9	3.8	198.7	197.6	1.1	FIXED BY FUNCTION
120	NAVAID	6/23/2022	PRIMARY	195.3	3.5	198.8	197.6	1.2	FIXED BY FUNCTION
121	SIGN	6/23/2022	PRIMARY	195.8	3.5	199.3	197.5	1.8	FIXED BY FUNCTION
122	SIGN	6/23/2022	PRIMARY	195.9	2.9	198.8	197.5	1.3	FIXED BY FUNCTION
123	SIGN	6/23/2022	PRIMARY	195.8	2.7	198.5	197.3	1.2	FIXED BY FUNCTION
124	NAVAID	6/23/2022	PRIMARY	194.4	3.4	197.8	197.0	0.8	FIXED BY FUNCTION
125	NAVAID	6/23/2022	PRIMARY	194.8	2.8	197.6	197.0	0.6	FIXED BY FUNCTION
126	WINDSOCK	6/23/2022	PRIMARY	192.5	20.1	212.6	196.9	15.7	FIXED BY FUNCTION
127	SIGN	6/23/2022	PRIMARY	195.1	2.7	197.8	196.5	1.3	FIXED BY FUNCTION

PART 77 RUNWAY 17 APPROACH SURFACE OBSTRUCTIONS

OBSTACLE ID	DESCRIPTION	SURVEY DATE	SURFACE	GROUND ELEVATION (FT)	AGL (FT)	TOP HEIGHT (FT)	SURFACE HEIGHT (FT)	PENETRATION (FT)	DISPOSITION
200	ROAD	6/23/2022	APPROACH 17	198.8	15.0	213.8	228.1	-14.3	NO OBSTRUCTION
201	POWER POLE	6/23/2022	APPROACH 17	197.8	43.0	240.8	238.0	2.8	TO BE LIGHTED
202	POWER POLE	6/23/2022	APPROACH 17	197.2	42.9	240.1	237.5	2.6	TO BE LIGHTED
203	ROAD	6/23/2022	APPROACH 17	196.2	15.0	211.2	241.9	-30.7	NO OBSTRUCTION
204	ROAD	6/23/2022	APPROACH 17	198.2	15.0	213.2	238.2	-25.0	NO OBSTRUCTION
205	TREE	6/23/2022	APPROACH 17	196.3	44.3	240.6	246.5	-5.9	NO OBSTRUCTION
206	TREE	6/23/2022	APPROACH 17	196.1	108.5	304.6	269.5	35.1	TO BE REMOVED
207	TREE	6/23/2022	APPROACH 17	195.2	109.6	304.8	269.1	35.7	TO BE REMOVED
208	TREE	6/23/2022	APPROACH 17	196.8	111.9	308.7	269.2	39.5	TO BE REMOVED
209	TREE	6/23/2022	APPROACH 17	197.7	116.8	314.5	267.0	47.5	TO BE REMOVED
210	TREE	6/23/2022	APPROACH 17	196.8	76.5	273.3	269.0	4.3	TO BE REMOVED
211	TREE	6/23/2022	APPROACH 17	196.2	75.3	271.5	269.7	1.8	TO BE REMOVED
212	TREE	6/23/2022	APPROACH 17	196.1	77.5	273.6	269.2	4.4	TO BE REMOVED
213	TREE	6/23/2022	APPROACH 17	195.8	84.2	280.0	270.8	9.2	TO BE REMOVED
214	TREE	6/23/2022	APPROACH 17	197.9	94.2	292.1	270.4	21.7	TO BE REMOVED
215	TREE	6/23/2022	APPROACH 17	195.2	93.3	288.5	270.9	17.6	TO BE REMOVED
216	TREE	6/23/2022	APPROACH 17	195.2	98.8	294.0	275.6	18.4	TO BE REMOVED
217	TREE	6/23/2022	APPROACH 17	197.3	91.1	288.4	273.7	14.7	TO BE REMOVED
218	TREE	6/23/2022	APPROACH 17	194.3	95.0	289.3	274.6	14.7	TO BE REMOVED
219	TREE	6/23/2022	APPROACH 17	195.0	89.0	284.0	277.2	6.8	TO BE REMOVED
220	TREE	6/23/2022	APPROACH 17	195.9	83.0	278.9	276.9	2.0	TO BE REMOVED
221	ROAD	6/23/2022	APPROACH 17	196.5	15.0	211.5	290.2	-78.7	NO OBSTRUCTION
222	BUILDING	6/23/2022	APPROACH 17	195.0	114.5	309.5	286.2	23.3	TO BE LIGHTED
223	BUILDING	6/23/2022	APPROACH 17	198.6	129.9	328.5	291.0	37.5	TO BE LIGHTED
224	TREE	6/23/2022	APPROACH 17	197.5	90.1	287.6	296.0	-8.4	NO OBSTRUCTION
225	ROAD	6/23/2022	APPROACH 17	190.1	15.0	205.1	321.0	-115.9	NO OBSTRUCTION
226	INTERSTATE	6/23/2022	APPROACH 17	173.5	17.0	190.5	443.5	-253.0	NO OBSTRUCTION
227	INTERSTATE	6/23/2022	APPROACH 17	170.0	17.0	187.0	452.3	-265.3	NO OBSTRUCTION
228	INTERSTATE	6/23/2022	APPROACH 17	132.3	17.0	149.3	456.8	-307.5	NO OBSTRUCTION
229	ROAD	6/23/2022	APPROACH 17	133.3	15.0	148.3	486.4	-338.1	NO OBSTRUCTION

PART 77 RUNWAY 17 APPROACH SURFACE OBSTRUCTIONS (CONT.)

OBSTACLE ID	DESCRIPTION	SURVEY DATE	SURFACE	GROUND ELEVATION (FT)	AGL (FT)	TOP HEIGHT (FT)	SURFACE HEIGHT (FT)	PENETRATION (FT)	DISPOSITION
230	ROAD	6/23/2022	APPROACH 17	140.1	15.0	155.1	493.6	-338.5	NO OBSTRUCTION
231	INTERSTATE	6/23/2022	APPROACH 17	119.4	17.0	136.4	480.8	-344.4	NO OBSTRUCTION
232	ROAD	6/23/2022	APPROACH 17	133.3	15.0	148.3	493.6	-345.3	NO OBSTRUCTION
233	ROAD	6/23/2022	APPROACH 17	109.1	15.0	124.1	493.6	-369.5	NO OBSTRUCTION
234	ROAD	6/23/2022	APPROACH 17	115.1	15.0	130.1	493.6	-363.5	NO OBSTRUCTION
235	INTERSTATE	6/23/2022	APPROACH 17	138.3	17.0	155.3	493.6	-338.3	NO OBSTRUCTION
236	INTERSTATE	6/23/2022	APPROACH 17	121.2	17.0	138.2	493.6	-355.4	NO OBSTRUCTION
237	INTERSTATE	6/23/2022	APPROACH 17	124.0	17.0	141.0	493.6	-352.6	NO OBSTRUCTION
238	INTERSTATE	6/23/2022	APPROACH 17	123.6	17.0	140.6	493.6	-353.0	NO OBSTRUCTION
239	INTERSTATE	6/23/2022	APPROACH 17	116.1	17.0	133.1	493.6	-360.5	NO OBSTRUCTION
240	INTERSTATE	6/23/2022	APPROACH 17	142.3	17.0	159.3	493.6	-334.3	NO OBSTRUCTION

PART 77 RUNWAY 35 APPROACH SURFACE OBSTRUCTIONS

OBSTACLE ID	DESCRIPTION	SURVEY DATE	SURFACE	GROUND ELEVATION (FT)	AGL (FT)	TOP HEIGHT (FT)	SURFACE HEIGHT (FT)	PENETRATION (FT)	DISPOSITION
300	TREE	6/23/2022	APPROACH 35	185.8	54.5	240.3	244.7	-4.4	NO OBSTRUCTION
301	TREE	6/23/2022	APPROACH 35	184.8	94.3	279.1	251.1	28.0	TO BE REMOVED
302	TREE	6/23/2022	APPROACH 35	186.0	79.4	265.4	255.6	9.8	TO BE REMOVED
303	TREE	6/23/2022	APPROACH 35	186.4	113.0	299.4	265.0	34.4	TO BE REMOVED
304	TREE	6/23/2022	APPROACH 35	183.0	112.5	295.5	269.6	25.9	TO BE REMOVED
305	ROAD	6/23/2022	APPROACH 35	176.3	15.0	191.3	286.9	-95.6	NO OBSTRUCTION
306	ROAD	6/23/2022	APPROACH 35	183.8	15.0	198.8	297.4	-98.6	NO OBSTRUCTION
307	TREE	6/23/2022	APPROACH 35	179.8	122.7	302.5	297.6	4.9	TO BE REMOVED
308	TREE	6/23/2022	APPROACH 35	181.6	122.3	303.9	300.7	3.2	TO BE REMOVED
309	ROAD	6/23/2022	APPROACH 35	181.2	15.0	196.2	331.5	-135.3	NO OBSTRUCTION
310	RAILROAD	6/23/2022	APPROACH 35	189.6	23.0	212.6	480.6	-268.0	NO OBSTRUCTION
311	ROAD	6/23/2022	APPROACH 35	149.7	15.0	164.7	490.2	-325.5	NO OBSTRUCTION
312	ROAD	6/23/2022	APPROACH 35	187.6	15.0	202.6	484.5	-281.9	NO OBSTRUCTION
313	RAILROAD	6/23/2022	APPROACH 35	189.5	23.0	212.5	490.2	-277.7	NO OBSTRUCTION
314	ROAD	6/23/2022	APPROACH 35	188.2	15.0	203.2	490.2	-287.0	NO OBSTRUCTION
315	ROAD	6/23/2022	HORIZONTAL	191.4	15.0	206.4	212.2	-5.8	NO OBSTRUCTION
316	ROAD	6/23/2022	HORIZONTAL	190.9	15.0	205.9	225.8	-19.9	NO OBSTRUCTION
317	TREE	6/23/2022	HORIZONTAL	186.4	54.9	241.3	228.5	12.8	TO BE REMOVED

PART 77 TRANSITIONAL SURFACE OBSTRUCTIONS

OBSTACLE ID	DESCRIPTION	SURVEY DATE	SURFACE	GROUND ELEVATION (FT)	AGL (FT)	TOP HEIGHT (FT)	SURFACE HEIGHT (FT)	PENETRATION (FT)	DISPOSITION
400	TREE	6/23/2022	TRANSITIONAL	199.1	109.0	308.1	309.7	-1.6	NO OBSTRUCTION
401	TREE	6/23/2022	TRANSITIONAL	200.7	84.5	285.2	294.9	-9.7	NO OBSTRUCTION
402	TREE	6/23/2022	TRANSITIONAL	200.0	116.5	316.5	316.0	0.5	TO BE REMOVED
403	TREE	6/23/2022	TRANSITIONAL	195.3	120.2	315.5	281.5	34.0	TO BE REMOVED
404	TREE	6/23/2022	TRANSITIONAL	199.8	111.0	310.8	314.9	-4.1	NO OBSTRUCTION
405	TREE	6/23/2022	TRANSITIONAL	197.1	70.9	268.0	264.9	3.1	TO BE REMOVED
406	TREE	6/23/2022	TRANSITIONAL	196.4	107.3	303.7	272.5	31.2	TO BE REMOVED
407	TREE	6/23/2022	TRANSITIONAL	193.1	84.1	277.2	234.4	42.8	TO BE REMOVED
408	TREE	6/23/2022	TRANSITIONAL	196.5	83.2	279.7	250.9	28.8	TO BE REMOVED
409	TREE	6/23/2022	TRANSITIONAL	197.8	71.1	268.9	256.2	12.7	TO BE REMOVED
410	TREE	6/23/2022	TRANSITIONAL	195.7	63.7	259.4	231.1	28.3	TO BE REMOVED
411	TREE	6/23/2022	TRANSITIONAL	195.8	64.9	260.7	245.4	15.3	TO BE REMOVED
412	TREE	6/23/2022	TRANSITIONAL	194.8	28.4	223.2	223.5	-0.3	NO OBSTRUCTION
413	TREE	6/23/2022	TRANSITIONAL	197.7	27.2	224.9	211.5	13.4	TO BE REMOVED
414	WINDSOCK	6/23/2022	TRANSITIONAL	197.1	20.4	217.5	200.3	17.2	FIXED BY FUNCTION

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BEND OFFICE
1020 SW EMKAY DRIVE
SUITE #100
BEND, OR 97702
541.322.8962 OFFICE

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JLS	JLS	DM	AS SHOWN
DATE: MAY 2025		PROJECT NO: 40097.106.01	

AURORA STATE AIRPORT

AIRSPACE OBSTRUCTION DATA TABLES

FIGURE NO.

PART 77 TRANSITIONAL SURFACE OBSTRUCTIONS (CONT.)

OBSTACLE ID	DESCRIPTION	SURVEY DATE	SURFACE	GROUND ELEVATION (FT)	AGL (FT)	TOP HEIGHT (FT)	SURFACE HEIGHT (FT)	PENETRATION (FT)	DISPOSITION
415	TREE	6/23/2022	TRANSITIONAL	195.6	27.8	223.4	229.9	-6.5	NO OBSTRUCTION
416	TREE	6/23/2022	TRANSITIONAL	195.6	64.2	259.8	234.7	25.1	TO BE REMOVED
417	TREE	6/23/2022	TRANSITIONAL	194.6	45.0	239.6	248.9	-9.3	NO OBSTRUCTION
418	ANTENNA ON BUILDING	6/23/2022	TRANSITIONAL	197.1	83.9	281.0	231.1	49.9	TO BE LIGHTED
419	ANTENNA ON BUILDING	6/23/2022	TRANSITIONAL	197.3	81.9	279.2	235.9	43.3	TO BE LIGHTED
420	TREE	6/23/2022	TRANSITIONAL	196.1	47.6	243.7	231.1	12.6	TO BE REMOVED
421	TREE	6/23/2022	TRANSITIONAL	196.0	93.6	289.6	258.2	31.4	TO BE REMOVED
422	ANTENNA - ASOS	6/23/2022	TRANSITIONAL	194.8	33.9	228.7	200.5	28.2	TO BE LIGHTED
423	TREE	6/23/2022	TRANSITIONAL	196.6	60.1	256.7	232.6	24.1	TO BE REMOVED
424	TREE	6/23/2022	TRANSITIONAL	196.2	33.1	229.3	234.4	-5.1	NO OBSTRUCTION
425	TREE	6/23/2022	TRANSITIONAL	195.4	31.6	227.0	234.8	-7.8	NO OBSTRUCTION
426	BUILDING	6/23/2022	TRANSITIONAL	198.4	39.4	237.8	233.9	3.9	TO BE LIGHTED
427	TREE	6/23/2022	TRANSITIONAL	195.5	76.1	271.6	261.4	10.2	TO BE REMOVED
428	TREE	6/23/2022	TRANSITIONAL	196.9	86.7	283.6	227.1	56.5	TO BE REMOVED
429	TREE	6/23/2022	TRANSITIONAL	197.0	66.5	263.5	263.1	0.4	TO BE REMOVED
430	TREE	6/23/2022	TRANSITIONAL	196.3	93.4	289.7	232.5	57.2	TO BE REMOVED
431	TREE	6/23/2022	TRANSITIONAL	197.0	92.4	289.4	266.0	23.4	TO BE REMOVED
432	TREE	6/23/2022	TRANSITIONAL	196.8	90.6	287.4	242.2	45.2	TO BE REMOVED
433	TREE	6/23/2022	TRANSITIONAL	196.6	107.4	304.0	298.9	5.1	TO BE REMOVED
434	TREE	6/23/2022	TRANSITIONAL	194.1	58.0	252.1	226.4	25.7	TO BE REMOVED
435	TREE	6/23/2022	TRANSITIONAL	191.6	68.0	259.6	246.8	12.8	TO BE REMOVED
436	TREE	6/23/2022	TRANSITIONAL	195.2	87.3	282.5	273.4	9.1	TO BE REMOVED
437	TREE	6/23/2022	TRANSITIONAL	196.1	46.6	242.7	230.7	12.0	TO BE REMOVED
438	TREE	6/23/2022	TRANSITIONAL	195.6	47.4	243.0	248.8	-5.8	NO OBSTRUCTION
439	TREE	6/23/2022	TRANSITIONAL	194.9	73.8	268.7	249.3	19.4	TO BE REMOVED
440	TREE	6/23/2022	TRANSITIONAL	193.7	62.1	255.8	232.0	23.8	TO BE REMOVED
441	TREE	6/23/2022	TRANSITIONAL	195.2	84.3	279.5	280.9	-1.4	NO OBSTRUCTION
442	TREE	6/23/2022	TRANSITIONAL	193.0	86.0	279.0	264.9	14.1	TO BE REMOVED
443	TREE	6/23/2022	TRANSITIONAL	191.9	86.4	278.3	233.0	45.3	TO BE REMOVED
444	TREE	6/23/2022	TRANSITIONAL	191.4	122.6	314.0	292.4	21.6	TO BE REMOVED
445	TREE	6/23/2022	TRANSITIONAL	188.6	101.6	290.2	262.9	27.3	TO BE REMOVED
446	TREE	6/23/2022	TRANSITIONAL	188.2	65.0	253.2	233.3	19.9	TO BE REMOVED
447	TREE	6/23/2022	TRANSITIONAL	183.8	65.8	249.6	243.1	6.5	TO BE REMOVED
448	TREE	6/23/2022	TRANSITIONAL	184.1	124.2	308.3	290.4	17.9	TO BE REMOVED
449	TREE	6/23/2022	TRANSITIONAL	186.1	100.0	286.1	243.3	42.8	TO BE REMOVED
450	TREE	6/23/2022	TRANSITIONAL	186.0	84.7	270.7	248.6	22.1	TO BE REMOVED

PART 77 HORIZONTAL SURFACE OBSTRUCTIONS

OBSTACLE ID	DESCRIPTION	SURVEY DATE	SURFACE	GROUND ELEVATION (FT)	AGL (FT)	TOP HEIGHT (FT)	SURFACE HEIGHT (FT)	PENETRATION (FT)	DISPOSITION
500	TREE	6/23/2022	HORIZONTAL	170.8	189.4	360.2	349.6	10.6	TO BE REMOVED
501	TREE	6/23/2022	HORIZONTAL	168.6	182.6	351.2	349.6	1.6	TO BE REMOVED
502	TREE	6/23/2022	HORIZONTAL	184.6	159.3	343.9	349.6	-5.7	NO OBSTRUCTION
503	TREE	6/23/2022	HORIZONTAL	188.7	168.2	356.9	349.6	7.3	TO BE REMOVED
504	TREE	6/23/2022	HORIZONTAL	187.8	161.5	349.3	349.6	-0.3	NO OBSTRUCTION
505	TREE	6/23/2022	HORIZONTAL	187.4	162.2	349.6	349.6	0.0	TO BE REMOVED
506	TREE	6/23/2022	HORIZONTAL	190.8	167.5	358.3	349.6	8.7	TO BE REMOVED
507	TREE	6/23/2022	HORIZONTAL	189.1	161.6	350.7	349.6	1.1	TO BE REMOVED
508	TREE	6/23/2022	HORIZONTAL	197.6	171.4	369.0	349.6	19.4	TO BE REMOVED
509	TREE	6/23/2022	HORIZONTAL	198.2	182.3	380.5	349.6	30.9	TO BE REMOVED
510	TREE	6/23/2022	HORIZONTAL	195.7	185.2	380.9	349.6	31.3	TO BE REMOVED
511	TREE	6/23/2022	HORIZONTAL	196.7	190.2	386.9	349.6	37.3	TO BE REMOVED
512	TREE	6/23/2022	HORIZONTAL	203.6	181.9	385.5	349.6	35.9	TO BE REMOVED
513	TREE	6/23/2022	HORIZONTAL	200.9	162.9	363.8	349.6	14.2	TO BE REMOVED
514	TREE	6/23/2022	HORIZONTAL	199.4	155.9	355.3	349.6	5.7	TO BE REMOVED
515	TREE	6/23/2022	HORIZONTAL	199.3	201.2	400.5	349.6	50.9	TO BE REMOVED
516	TREE	6/23/2022	HORIZONTAL	191.0	159.5	350.5	349.6	0.9	TO BE REMOVED
517	TREE	6/23/2022	HORIZONTAL	200.7	177.3	378.0	349.6	28.4	TO BE REMOVED
518	TREE	6/23/2022	HORIZONTAL	208.2	168.5	376.7	349.6	27.1	TO BE REMOVED

PART 77 HORIZONTAL SURFACE OBSTRUCTIONS (CONT.)

OBSTACLE ID	DESCRIPTION	SURVEY DATE	SURFACE	GROUND ELEVATION (FT)	AGL (FT)	TOP HEIGHT (FT)	SURFACE HEIGHT (FT)	PENETRATION (FT)	DISPOSITION
519	TREE	6/23/2022	HORIZONTAL	195.3	145.0	340.3	349.6	-9.3	NO OBSTRUCTION
520	TREE	6/23/2022	HORIZONTAL	184.3	155.6	339.9	349.6	-9.7	NO OBSTRUCTION
521	TREE	6/23/2022	HORIZONTAL	192.9	151.6	344.5	349.6	-5.1	NO OBSTRUCTION
522	TREE	6/23/2022	HORIZONTAL	191.9	152.3	344.2	349.6	-5.4	NO OBSTRUCTION
523	TREE	6/23/2022	HORIZONTAL	179.7	183.2	362.9	349.6	13.3	TO BE REMOVED
524	TREE	6/23/2022	HORIZONTAL	183.1	171.4	354.5	349.6	4.9	TO BE REMOVED
525	TREE	6/23/2022	HORIZONTAL	186.5	171.7	358.2	349.6	8.6	TO BE REMOVED
526	TREE	6/23/2022	HORIZONTAL	186.7	171.0	357.7	349.6	8.1	TO BE REMOVED
527	TREE	6/23/2022	HORIZONTAL	189.5	165.2	354.7	349.6	5.1	TO BE REMOVED
528	TREE	6/23/2022	HORIZONTAL	183.5	165.6	349.1	349.6	-0.5	NO OBSTRUCTION
529	TREE	6/23/2022	HORIZONTAL	191.2	150.6	341.8	349.6	-7.8	NO OBSTRUCTION
530	TREE	6/23/2022	HORIZONTAL	158.7	187.1	345.8	349.6	-3.8	NO OBSTRUCTION
531	TREE	6/23/2022	HORIZONTAL	193.8	158.5	352.3	349.6	2.7	TO BE REMOVED
532	TREE	6/23/2022	HORIZONTAL	167.4	173.6	341.0	349.6	-8.6	NO OBSTRUCTION
533	TREE	6/23/2022	HORIZONTAL	206.5	148.2	354.7	349.6	5.1	TO BE REMOVED
534	TREE	6/23/2022	HORIZONTAL	186.6	160.8	347.4	349.6	-2.2	NO OBSTRUCTION
535	TREE	6/23/2022	HORIZONTAL	185.6	168.6	354.2	349.6	4.6	TO BE REMOVED
536	TREE	6/23/2022	HORIZONTAL	144.3	219.8	364.1	349.6	14.5	TO BE REMOVED
538	TREE	6/23/2022	HORIZONTAL	190.9	168.1	359.0	349.6	9.4	TO BE REMOVED
537	TREE	6/23/2022	HORIZONTAL	176.7	189.9	366.6	349.6	17.0	TO BE REMOVED
539	TREE	6/23/2022	HORIZONTAL	191.7	171.2	362.9	349.6	13.3	TO BE REMOVED
540	TREE	6/23/2022	HORIZONTAL	180.4	192.9	373.3	349.6	23.7	TO BE REMOVED
541	TREE	6/23/2022	HORIZONTAL	184.3	158.6	342.9	349.6	-6.7	NO OBSTRUCTION
542	TREE	6/23/2022	HORIZONTAL	182.8	185.8	368.6	349.6	19.0	TO BE REMOVED
543	TREE	6/23/2022	HORIZONTAL	192.8	163.7	356.5	349.6	6.9	TO BE REMOVED
544	TREE	6/23/2022	HORIZONTAL	189.7	157.1	346.8	349.6	-2.8	NO OBSTRUCTION
545	TREE	6/23/2022	HORIZONTAL	156.7	198.6	355.3	349.6	5.7	TO BE REMOVED
546	TREE	6/23/2022	HORIZONTAL	183.7	176.4	360.1	349.6	10.5	TO BE REMOVED
547	TREE	6/23/2022	HORIZONTAL	177.0	196.2	373.2	349.6	23.6	TO BE REMOVED
548	TREE	6/23/2022	HORIZONTAL	183.3	192.3	375.6	349.6	26.0	TO BE REMOVED
549	TREE	6/23/2022	HORIZONTAL	190.8	193.7	384.5	349.6	34.9	TO BE REMOVED
550	TREE	6/23/2022	HORIZONTAL	188.3	178.7	367.0	349.6	17.4	TO BE REMOVED
551	TREE	6/23/2022	HORIZONTAL	170.8	172.0	342.8	349.6	-6.8	NO OBSTRUCTION
552	TREE	6/23/2022	HORIZONTAL	187.6	165.0	352.6	349.6	3.0	TO BE REMOVED
554	TREE	6/23/2022	HORIZONTAL	177.8	164.2	342.0	349.6	-7.6	NO OBSTRUCTION
557	TREE	6/23/2022	HORIZONTAL	192.1	158.3	350.4	349.6	0.8	TO BE REMOVED
558	TREE	6/23/2022	HORIZONTAL	186.1	175.8	361.9	349.6	12.3	TO BE REMOVED
559	TREE	6/23/2022	HORIZONTAL	181.1	180.3	361.4	349.6	11.8	TO BE REMOVED
560	TREE	6/23/2022	HORIZONTAL	190.9	169.0	359.9	349.6	10.3	TO BE REMOVED
561	TREE	6/23/2022	HORIZONTAL	189.1	172.8	361.9	349.6	12.3	TO BE REMOVED
562	TREE	6/23/2022	HORIZONTAL	186.5	173.6	360.1	349.6	10.5	TO BE REMOVED
563	TREE	6/23/2022	HORIZONTAL	182.2	177.6	359.8	349.6	10.2	TO BE REMOVED
564	TREE	6/23/2022	HORIZONTAL	178.9	162.9	341.8	349.6	-7.8	NO OBSTRUCTION
565	TREE	6/23/2022	HORIZONTAL	162.9	205.8	368.7	349.6	19.1	TO BE REMOVED
566	TREE	6/23/2022	HORIZONTAL	173.2	200.2	373.4	349.6	23.8	TO BE REMOVED

CONICAL

NO OBSTRUCTIONS

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CENTURY WEST ENGINEERING

BEND OFFICE
1020 SW EMKAY DRIVE
SUITE #100
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DATE: MAY 2025		PROJECT NO: 40097.106.01	

AURORA STATE AIRPORT

AIRSPACE OBSTRUCTION DATA TABLES

FIGURE NO.

SHEET NO. 16 OF 17

RUNWAY 17 DEPARTURE SURFACE OBSTRUCTIONS

OBSTACLE ID	DESCRIPTION	SURVEY DATE	SURFACE	GROUND ELEVATION (FT)	AGL (FT)	TOP HEIGHT (FT)	SURFACE HEIGHT (FT)	PENETRATION (FT)	DISPOSITION
300	TREE	6/23/2022	DEPARTURE 17	185.8225	54.4775	240.3	242.4	-2.1	TO BE REMOVED
301	TREE	6/23/2022	DEPARTURE 17	184.8363	94.2637	279.1	247.9	31.2	TO BE REMOVED
302	TREE	6/23/2022	DEPARTURE 17	186.02	79.38	265.4	251.7	13.7	TO BE REMOVED
303	TREE	6/23/2022	DEPARTURE 17	186.42	112.98	299.4	259.7	39.7	TO BE REMOVED
304	TREE	6/23/2022	DEPARTURE 17	183.045	112.455	295.5	263.6	31.9	TO BE REMOVED
307	TREE	6/23/2022	DEPARTURE 17	179.785	122.715	302.5	287.4	15.1	TO BE REMOVED
308	TREE	6/23/2022	DEPARTURE 17	181.59	122.31	303.9	290	13.9	TO BE REMOVED
443	TREE	6/23/2022	DEPARTURE 17	191.9375	86.3625	278.3	272.7	5.6	TO BE REMOVED
446	TREE	6/23/2022	DEPARTURE 17	188.1525	65.0475	253.2	258.1	-4.9	TO BE REMOVED
449	TREE	6/23/2022	DEPARTURE 17	186.0875	100.0125	286.1	242.6	43.5	TO BE REMOVED
450	TREE	6/23/2022	DEPARTURE 17	185.9913	84.7087	270.7	243.4	27.3	TO BE REMOVED
514	TREE	6/23/2022	DEPARTURE 17	199.4275	155.8725	355.3	337	18.3	TO BE REMOVED
800	TREE	6/23/2022	DEPARTURE 17	172.84	158.76	331.6	328.8	2.8	TO BE REMOVED
801	TREE	6/23/2022	DEPARTURE 17	168.365	162.435	330.8	330.6	0.2	TO BE REMOVED

RUNWAY 35 DEPARTURE SURFACE OBSTRUCTIONS

OBSTACLE ID	DESCRIPTION	SURVEY DATE	SURFACE	GROUND ELEVATION (FT)	AGL (FT)	TOP HEIGHT (FT)	SURFACE HEIGHT (FT)	PENETRATION (FT)	DISPOSITION
201	POWER POLE	6/23/2022	DEPARTURE 35	197.79	43.01	240.8	237.3	3.5	TO BE LIGHTED
202	POWER POLE	6/23/2022	DEPARTURE 35	197.2	42.9	240.1	236.8	3.3	TO BE LIGHTED
206	TREE	6/23/2022	DEPARTURE 35	196.1263	108.4737	304.6	264	40.6	TO BE REMOVED
207	TREE	6/23/2022	DEPARTURE 35	195.1712	109.6288	304.8	263.7	41.1	TO BE REMOVED
208	TREE	6/23/2022	DEPARTURE 35	196.7612	111.9388	308.7	263.8	44.9	TO BE REMOVED
209	TREE	6/23/2022	DEPARTURE 35	197.6525	116.8475	314.5	261.9	52.6	TO BE REMOVED
210	TREE	6/23/2022	DEPARTURE 35	196.7813	76.5187	273.3	263.6	9.7	TO BE REMOVED
211	TREE	6/23/2022	DEPARTURE 35	196.2325	75.2675	271.5	264.1	7.4	TO BE REMOVED
212	TREE	6/23/2022	DEPARTURE 35	196.1187	77.4813	273.6	263.8	9.8	TO BE REMOVED
213	TREE	6/23/2022	DEPARTURE 35	195.7813	84.2187	280	265.1	14.9	TO BE REMOVED
214	TREE	6/23/2022	DEPARTURE 35	197.8713	94.2287	292.1	264.8	27.3	TO BE REMOVED
215	TREE	6/23/2022	DEPARTURE 35	195.2338	93.2662	288.5	265.2	23.3	TO BE REMOVED
216	TREE	6/23/2022	DEPARTURE 35	195.1513	98.8487	294	269.2	24.8	TO BE REMOVED
217	TREE	6/23/2022	DEPARTURE 35	197.2512	91.1488	288.4	267.6	20.8	TO BE REMOVED
218	TREE	6/23/2022	DEPARTURE 35	194.3013	94.9987	289.3	268.4	20.9	TO BE REMOVED
219	TREE	6/23/2022	DEPARTURE 35	194.9687	89.0313	284	270.6	13.4	TO BE REMOVED
220	TREE	6/23/2022	DEPARTURE 35	195.9325	82.9675	278.9	270.3	8.6	TO BE REMOVED
222	TREE	6/23/2022	DEPARTURE 35	195.0237	114.4763	309.5	278.2	31.3	TO BE REMOVED
223	TREE	6/23/2022	DEPARTURE 35	198.5888	129.9112	328.5	282.3	46.2	TO BE REMOVED
224	TREE	6/23/2022	DEPARTURE 35	197.51	90.09	287.6	286.5	1.1	TO BE REMOVED
400	TREE	6/23/2022	DEPARTURE 35	199.1362	108.9638	308.1	292.8	15.3	TO BE REMOVED
401	TREE	6/23/2022	DEPARTURE 35	200.675	84.525	285.2	278.2	7	TO BE REMOVED
403	TREE	6/23/2022	DEPARTURE 35	195.3275	120.1725	315.5	264.9	50.6	TO BE REMOVED
407	TREE	6/23/2022	DEPARTURE 35	193.0688	84.1312	277.2	262.5	14.7	TO BE REMOVED
509	TREE	6/23/2022	DEPARTURE 35	198.1675	182.3325	380.5	388.5	-8	TO BE REMOVED
510	TREE	6/23/2022	DEPARTURE 35	195.68	185.22	380.9	342.1	38.8	TO BE REMOVED
556	TREE	6/23/2022	DEPARTURE 35	186.355	54.945	241.3	228.6	12.7	TO BE REMOVED
700	ROAD	6/23/2022	DEPARTURE 35	199.8	15	214.8	204.5	10.3	TO BE REMOVED

DRAFT

"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 3-41-0004-022-2021) 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."

NO.	DATE	BY	APPR	REVISIONS

VERIFY SCALES

BAR IS ONE INCH ON ORIGINAL DRAWING.
0" 1"
IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY.

FEDERAL AVIATION ADMINISTRATION APPROVAL

APPROVAL DATE: _____

SIGNATURE

OREGON DEPARTMENT OF AVIATION APPROVAL

APPROVAL DATE: _____

SIGNATURE

CENTURY WEST ENGINEERING
BEND OFFICE
1020 SW EMKAY DRIVE
SUITE #100
BEND, OR 97702
541.322.8962 OFFICE

DESIGNED BY:	DRAWN BY:	CHECKED BY:	SCALE:
JLS	JLS	DM	AS SHOWN
DATE: MAY 2025		PROJECT NO: 40097.106.01	

AURORA STATE AIRPORT

AIRSPACE OBSTRUCTION DATA TABLES

FIGURE NO.

SHEET NO. 17 OF 17

Air Traffic Control Tower – Source: ODAV

Chapter 7

Capital Improvement Plan

Introduction

The purpose of this chapter is to provide guidance on funding and implementation of the recommendations from the analyses conducted in the Facility Requirements and the Development Alternatives, as identified in Chapters 4 and 5. The airport Capital Improvement Plan (CIP) is developed by the airport and submitted to Federal Aviation Administration (FAA) each year in order to detail and prioritize projects based on need, eligibility, and funding availability.

The CIP projects, summarized in **Table 7-1**, are organized into short and long-term planning periods that reflect both project prioritization and financial capabilities. Several key factors helped determine the prioritization of projects, including those that improve safety, upgrades needed to meet current FAA design standards, and ongoing maintenance and replacement of existing airfield facilities. Minor pavement maintenance items, such as vegetation removal and crack filling, are not included in the CIP but will need to be undertaken by the Oregon Department of Aviation (ODAV) on a routine basis.

A brief environmental review was prepared and is included in the airport master plan (see **Appendix 2**). The overview provides baseline information about the airport site and conditions that may impact proposed development areas for planning purposes. All federally funded projects will require a project-specific environmental study, and the level of environmental analysis will be determined by FAA on a project-by-project basis.

Individual projects for the first five years of the planning period are listed in order of priority by year. Projects outlined as long-term (years 6-20) are listed in order of general priority but have not been assigned a year. Each project's eligibility for FAA funding is noted, based on current federal legislation and funding formulas. Specific project details are depicted on the Airport Layout Plan and Terminal Area Plan drawings contained in Chapter 6.

A primary source of potential funding identified in this plan is the FAA's Airport Improvement Program (AIP). For projects eligible under AIP, FAA typically covers 90% of planned costs with a 10% local match. Funds from this program are derived from the Aviation Trust Fund, which is the depository for all federal aviation taxes collected on such items as airline tickets, aviation fuel, lubricants, tires, aircraft registrations, and other aviation related fees.

These funds are distributed by FAA under appropriations set by Congress for all airports in the United States included in the federal airport system (National Plan of Integrated Airport Systems – NPIAS).

However, as noted in **Table 7-1**, the projected 20-year total for FAA eligible projects in the CIP significantly exceeds current FAA funding levels through the Non-Primary Entitlement (NPE) program, which is $150,000 annually.

While other types of FAA funding may be available for some projects, it is reasonable to assume not all eligible projects are likely to be funded despite establishing FAA funding eligibility. ODAV must maximize the use of available FAA and other outside funding sources as it manages its CIP. In some cases, the limited availability of funds may require deferring some projects, or increasing the amount of local, state, or private funding.

Airport Development Schedule and Cost Estimates

Cost estimates for each individual project were developed in 2024 dollars based on typical construction costs associated with the specific type of project. Cost estimates were prepared based on the best engineering, design, environmental and construction information available at the time, as well as the best available public information on property values. The estimates are intended only for preliminary planning and programming purposes. Specific project analysis and detailed engineering design will be required prior to project implementation to provide more refined and detailed estimates of the development costs.

These cost estimates can continue to assist management through adjustments to the 2024-dollar amounts to account for subsequent inflation as the plan is carried out in future years. This can be accomplished by converting the appropriate change in the United States Consumer Price Index (USCPI) to a multiplier using the following formula:

$$X / I = Y$$

Where:
X = USCPI in any given future year
Y = Change Ratio
I = Current Index (USCPI)[1]

USCPI-U
315.605
March 2024
(1982-1984 = 100)

Multiplying the change ratio (Y) times any 2024-based cost estimate presented in this study will yield the adjusted dollar amounts appropriate in any future year evaluation. Several different USCPI-based indices are available for use and any applicable index may be substituted by the airport sponsor in its financial management program.

The following sections outline the recommended development program and funding assumptions for the short- and long-term projects. The definition of overall project scheduling is based on the facility requirements identified in the master plan evaluation. The projected staging of development projects is based on a combination of needs and development priorities.

It is recognized that actual activity levels may vary from projected levels. The implementation of development projects will be determined by ODAV when demand warrants, rather than according to the proposed organization of projects presented in this chapter. If the assumptions made in the master plan remain valid, the project prioritization reflected in the CIP will provide a reliable guide for development. When activity deviates from projected levels, program adjustments may be made. FAA meets with airport sponsors annually to review the CIP and provide an opportunity to adjust short-term development priorities based on need and FAA funding availability.

1 U.S. Consumer Price Index for All Urban Consumers (USCPI-U)

In addition to major capital projects, ODAV will continue to perform regular facility maintenance projects such as pavement maintenance, signage and lighting repairs, navigational aid repairs, and repainting of faded markings.

CAPITAL IMPROVEMENT PLAN – PROJECTS

The projects identified in **Table 7-1** are summarized below for short- and long-term periods. The summaries provide a general time frame for implementation of individual projects. However, the actual timing for project implementation is subject to change, based on a variety of factors including availability of funding. Projects that are not completed during the current 20-year planning period will be reevaluated based on need, with determinations on future timing made by ODAV.

Short-Term Projects

The short-term development projects are of the highest priority and are planned to occur in the short-term (0-5 years). These projects include:

Runway Rehabilitation: The highest priority project in the short-term development period is the rehabilitation of Runway 17-35. The rehabilitation includes a deep/variable mill with inlay and crown correction, followed by pavement grooving and marking.

Easement Acquisition: Avigation easements for properties beyond the runway ends will be pursued to facilitate mitigation of obstructions (trees) impacting approach, departure, and obstacle clear surfaces.

Obstruction Removal: Tree obstructions beyond both ends of the runway will be removed or lowered to clear airspace surfaces to maintain the operational safety of the runway.

Pavement Maintenance: Maintenance of the existing airfield pavement will be performed to extend its useful life. Maintenance may include crack sealing, patching, and seal coats. ODAV completes these projects through the ODAV Pavement Maintenance Program (PMP) and does not use FAA funds.

Taxiway Reconstruction, Lighting and Signage Replacement, Drainage Mitigation (RSA): This project will reconstruct and upgrade the parallel taxiway and its exit taxiways to accommodate the current fleet mix, address existing pavement distresses, mitigate direct access connections with adjacent aprons/taxilanes, and meet applicable FAA design standards. Existing taxiway lighting and signage with be replaced with LED units. The existing drainage ditch adjacent to the west side of the taxiway also requires mitigation/regrading to comply with C-II Runway Safety Area (RSA) surface criteria.

Long-Term Projects

The long-term development projects are anticipated to occur outside of the short-term 5-year window. These projects include airfield pavement maintenance projects; the realignment of Hubbard Highway; the realignment of Keil Road; the acquisition of avigation easements; reconstruction and the north 497-foot extension of Runway 17-35; the north 497-foot extension of Taxiway A; the construction of a new flight school apron; and the update of the Airport Master Plan.

TABLE 7-1: ESTIMATED COST OF CAPITAL IMPROVEMENT PROJECTS

Short Term Projects	Estimated Cost	Anticipated FAA Share (90%)	Anticipated Local Share (10%)
Runway Rehabilitation - Construction	$3,247,500	$2,922,750	$324,750
Obstruction Removal - Easement Acquisition	$825,000	$742,500	$82,500
Obstruction Removal - Design	$155,000	$139,500	$15,500
Obstruction Removal - Construction	$354,000	$318,600	$35,400
Pavement Maintenance - Design and Construction**	-	-	-
Taxiway Reconstruction and Drainage Ditch Mitigation - Environmental	$756,000	$680,400	$75,600
SHORT-TERM TOTAL (0-5 Years)	**$5,337,500**	**$4,803,750**	**$533,750**

Long Term Projects	Estimated Cost	Anticipated FAA Share (90%)	Anticipated Local Share (10%)
Taxiway Reconstruction and Drainage Ditch Mitigation - Design	$780,000	$702,000	$78,000
Pavement Maintenance - Design and Construction**	-	-	-
Taxiway Reconstruction and Drainage Ditch Mitigation - Construction	$14,070,000	$12,663,000	$1,407,000
Realign Hubbard Highway/Clear ROFA - Environmental	$1,320,000	$1,188,000	$132,000
Realign Hubbard Highway - Easement/Property Acquisition*	$16,582,000	$14,923,800	$1,658,200
Realign Hubbard Highway - Design	$1,920,000	$1,728,000	$192,000
Pavement Maintenance - Design and Construction**	-	-	-
Realign Hubbard Highway - Construction	$30,631,000	$27,567,900	$3,063,100
Realign Keil Road - Environmental	$408,000	$367,200	$40,800
Internal Road Improvements	$100,000	$90,000	$10,000
Airport Master Plan	$1,000,000	$900,000	$100,000
Pavement Maintenance - Design and Construction**	-	-	-
Realign Keil Road - Easement/Property Acquisition	$1,184,000	$1,065,600	$118,400
Realign Keil Road - Design	$396,000	$356,400	$39,600
Realign Keil Road - Construction	$2,358,000	$2,122,200	$235,800
Pavement Maintenance - Design and Construction**	-	-	-
South Avigation Easement	-	-	-
Reconstruct and Extend Runway/ Extend Taxiway A - Environmental	$636,000	$572,400	$63,600
Reconstruct and Extend Runway/ Extend Taxiway A - Design	$876,000	$788,400	$87,600
Reconstruct and Extend Runway/ Extend Taxiway A - Construction	$22,185,000	$19,966,500	$2,218,500
Pavement Maintenance - Design and Construction**	-	-	-
New Flight School Apron - Environmental	$342,000	$307,800	$34,200
New Flight School Apron - Design	$498,000	$448,200	$49,800
New Flight School Apron - Construction	$3,180,000	$2,862,000	$318,000
LONG-TERM PROJECTS TOTAL COSTS	**$98,466,000**	**$88,619,400**	**$9,846,600**
TOTAL PROJECT COSTS	**$103,803,500**	**$93,423,150**	**$10,380,350**

*Year shown for easement/property acquisition is reimbursement year. Project originates 1-2 year(s) before year shown.
**Owner does not use Federal funds for pavement maintenance; performs on their own.

Capital Funding Sources & Programs

Grants provided through the FAA Airport Improvement Program (AIP) are the primary source of funding for public use airports in the federal airport system. It is important to note that overall project eligibility for FAA funding does not guarantee availability of funding within the defined 20-year time frame of the master plan.

FEDERAL GRANTS

The current AIP, reauthorized in 2024, is the latest evolution of a funding program originally authorized by Congress in 1946 as the Federal Aid to Airports Program (FAAP). Appropriations of AIP funds go to states, and to a portion of NPIAS general aviation (GA) and commercial service airports. AIP funds are designated as Discretionary funds and may be used by the FAA to fund eligible projects. Discretionary funds are typically used to enhance airport capacity, safety, and/or security and are often directed to specific national priorities such as the recent program to improve runway safety areas. AIP funds can only be used for eligible capital improvement projects and may not be used to support airport operation and maintenance costs. AIP funding for eligible projects is described in FAA Order 5100.38D (Change 1), Airport Improvement Program Handbook.

Funds for the AIP are derived from the Airport and Airway Trust Fund, which is supported by user fees, fuel taxes, and other similar revenue sources. For the years 2025 and 2026, AIP grants cover 95% of eligible project costs for GA airports like the Aurora State Airport, up from the normal 90% coverage. It is unknown if future years will be covered at a higher than normal coverage and are determined under reauthorization.

The FAA Reauthorization Act of 2024 extends funding through fiscal year 2028. AIP funding programs for GA airports include:

AIP General Aviation Non-Primary Entitlement (NPE) Grants: The AIP provides NPE funds for GA airports based on a fixed amount of $150,000 per year. The NPE funds can be carried over for up to four years, or a maximum of $600,000. Unused NPEs may be "donated" to other GA airports within the state through the Airport District Office (ADO), or the funds revert into a national pot for reallocation among all FAA regions.

AIP Discretionary Grants: The AIP provides Discretionary funds to airports for projects that have a high federal priority or to enhance safety, security, or capacity. These grants are over and above NPE funding. Discretionary grant amounts can vary significantly compared to NPE and are awarded at the FAA's sole discretion. Discretionary grant applications are evaluated based on:

- Need
- FAA's project ranking system
- FAA's assessment of a project's significance within the national airport and airway system

FAA Facilities and Equipment Funds: Additional funds are available under the FAA Facilities and Equipment (F&E) program to purchase navigational aids and air safety-related technical equipment, including Airport Traffic Control Towers (ATCTs) for use at commercial service airports in the National Airport System. Each F&E project is evaluated independently using a cost-benefit analysis to determine funding eligibility and priority ranking. Qualified projects are funded in total (i.e., 100%) by the FAA, while remaining projects would likely be eligible for funding through the AIP programs. In addition, an airport can apply for NAVAID maintenance funding through the F&E program for those facilities not funded through the F&E program.

FAA funding is limited to projects that have a clearly defined need and are identified through preparation of an FAA approved Airport Layout Plan (ALP). Periodic updates of the ALP are required when new or unanticipated project needs or opportunities exist that require use of FAA funds and to reflect the status of completed projects. The FAA will generally not participate in projects involving vehicle parking, building renovations, or projects associated with non-aeronautical development. Projects such as hangar construction or fuel systems are eligible for funding, although the FAA considers these types of projects a low priority. As part of the economic recovery response to the COVID-19 pandemic, several supplemental funding programs were introduced that benefited airports. These included the American Rescue Plan Act (ARPA) and the Bipartisan Infrastructure Law (BIL), also known as the Infrastructure Investment and Jobs Act (IIJA). These grant programs created temporary funding streams for airports beyond traditional AIP funding.

Airport sponsors accept obligations (grant assurances) when accepting FAA AIP grants. See the FAA AIP Handbook for a complete description of all FAA grant assurances.

STATE FUNDING

ODAV offers a variety of programs for funding airport projects that are outlined in this section and may be used by ODAV as owner/sponsor for ongoing maintenance projects, local match, and to support projects that may not rank high for FAA eligibility. These programs include:

Pavement Maintenance Program

The Pavement Maintenance Program (PMP) programs airfield pavement maintenance funds on established multi-year cycles. The PMP is funded by Oregon state aviation fuel tax revenues. About half of Oregon's pre-House Bill (HB) 2075 aviation fuel tax revenue (see following section) is used to fund the PMP, with the remainder used to fund the operation of Oregon's 28 state-owned airports and ODAV administrative costs.

The PMP is intended to preserve and maintain existing airfield pavements in order to maximize the useful life and economic value of the pavement. The program funds pavement maintenance and associated improvements (crack filling, repair, sealcoats, etc.), including some items not traditionally funded by FAA.

Funding for the PMP is generated through collection of aviation fuel taxes. ODAV manages the PMP through an annual consultant services contract and work is programmed on a 4-year regional rotation. The program includes a regular schedule of inspection and subsequent fieldwork.

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 of prior year's Pavement Condition Index (PCI) reports.
- Only consider PCIs above 70.
- Apply budget.
- Limit work to patching, crack sealing, fog sealing, and slurry sealing.
- Add allowance for striping.
- Program to include approximately 20 airports per year, depending on funding levels.

Connect Oregon Program

In 2005, the Legislature created Connect Oregon, which used proceeds from lottery-backed bonds to provide grants and loans to fund non-highway transportation projects. In 2014, after the fifth installment of funding, the Oregon Legislature had provided approximately $382 million to the program. Connect Oregon grants fund up to 80% of project costs, with a 20% sponsor match and loans up to 100% of project costs.

House Bill 2075

House Bill 2075 (HR 2075) increased the tax on aircraft fuels, providing new revenues for the State Aviation Account. The previous state aviation fuel tax rate was $0.01/gallon for jet fuel (Jet-A) and $0.09/gallon for Aviation Gasoline – (AVGAS). HR 2075 increased the fuel tax on both Jet-A and AVGAS by $0.02/gallon resulting in a tax of $0.03 per gallon for Jet-A and $0.11 per gallon for AVGAS. The original aviation fuel tax revenue structure that supports PMP and ODAV operations is unchanged. The additional $0.02/gallon in revenues on Jet-A and AVGAS generated by HR 2075 will be distributed to fund a variety of aviation needs through ODAV's new Aviation

System Action Program (ASAP) fund. ASAP utilizes the additional $0.02/gallon revenues generated by HR 2075 among three new programs: **COAR** - Critical Oregon Airport Relief Program; **ROAR** – Rural Oregon Aviation Relief Program; and **SOAR** – State Owned Airports Reserve Program. The programs are summarized below.

COAR – 50% of the additional fuel tax revenue is distributed as follows:

a) To assist airports in Oregon with match requirements for FAA Airport Improvement Program grants.

b) To make grants for emergency preparedness and infrastructure projects, in accordance with the Oregon Resilience Plan, including seismic studies, emergency generators, etc.

c) To make grants for:

- Services critical or essential to aviation including, but not limited to, fuel, sewer, water, and weather equipment.
- Aviation-related business development includes, but not limited to, hangars, parking for business aircraft and related facilities.
- Airport development for local economic benefit, including but not limited to, signs and marketing.

ROAR – 25% of the additional fuel tax revenue is distributed to assist commercial air service to rural Oregon.

SOAR – 25% of the additional fuel tax revenue is distributed to state owned airports for:

a) Safety improvements recommended by the Oregon State Aviation Board and local community airports.

b) Infrastructure projects at public use airports.

State Capital Improvement Program (SCIP)

The FAA's Seattle ADO in conjunction with state aviation agencies in Oregon, Washington, and Idaho have developed a coordinated "state" capital improvement program, known as the SCIP. The SCIP is the primary tool used by FAA, state aviation agencies, and local airport sponsors to prioritize funding. Airport sponsors are required to provide annual updates to the short-term project lists annually in order to maintain a current system of defined project needs. The short-term priorities identified in the master plan CIP will be incorporated into the SCIP during the next coordination meeting.

LOCAL FUNDING

The locally funded (ODAV/tenant) portion of the project costs during the 20-year planning period is estimated to be just under $10.4 million, as currently defined. Hangar construction costs and building maintenance have not been included in the CIP, since no FAA funding is assumed.

Portions of local matching funds are generated through airport revenues, including land leases and hangar rentals. Airport sponsors occasionally fund infrastructure and revenue-generating development such as hangars, either through interfund loans or the issuance of long-term debt (bonds).

CENTURY WEST
ENGINEERING