Chapter 4

Airport Facility Requirements

The evaluation of airport facility requirements is intended to determine the facility needs for Joseph State Airport (JSY) for the current twenty-year planning period based on updated aviation activity forecasts and conformance to established airport design criteria.

Introduction

The evaluation of airport facility requirements combines the results of the inventory and forecasts contained in Chapters 2 and 3, and established planning criteria to determine the future facility needs for the Airport during the current twenty-year planning period. Airside facilities include the airspace around the Airport, runways, taxiways, navigational aids and lighting systems. Landside facilities include hangars, terminal, and fixed base operator (FBO) facilities, aircraft parking apron(s), and surface access and automobile parking. Support Facilities such as aircraft fueling, security/perimeter fencing, and utilities are also examined. All airfield items are evaluated based on established Federal Aviation Administration (FAA) standards and community derived goals for the Airport.

The facility requirements evaluation identifies the adequacy or inadequacy of existing facilities and identifies what new facilities may be needed during the planning period based on forecast demand or conformance to FAA standards. The evaluation of demand-driven elements will quantify facility needs such as runway length requirements, hangar space, and aircraft parking positions based on forecast demand and the type of aircraft being accommodated. Items such as lighting, navigational aids, and approach capabilities are evaluated based on overall airport activity and facility classification. Potential options for accommodating current and future facility needs will be evaluated in the Airport Development Alternatives (Chapter 5).

Demand/Capacity Analysis

The evaluation of runway capacity is used to identify existing or future operational constraints that may require specific facility improvements such as taxiways, aircraft hold areas, etc. As noted earlier, Runway 15/33 has a full length parallel taxiway and five 90-degree exit taxiways. This configuration provides a high level of functionality and operational capacity for general aviation (GA) runways.

Annual service volume (ASV) is a broad measure of airport capacity and delay used for long-term planning as defined in *FAA Advisory Circular (AC) 150/5060-5, Airport Capacity and Delay.* Although the generic ASV calculation assumes optimal conditions (air traffic control, radar, etc.) that do not exist at Joseph State Airport, it provides a reasonable basis for approximating existing and future capacity for master planning purposes.

The FAA estimates the ASV for a single runway with no air carrier traffic is approximately 230,000 annual operations. Hourly capacity is estimated to be 98 operations during visual flight rules (VFR) conditions and 59 operations during instrument flight rules (IFR) conditions. The existing and future demand-capacity ratios for Runway 15/33 are presented below:

Existing Capacity: 4,192 Annual Operations / 230,000 ASV = 2% (demand/capacity ratio)

Future Capacity: 6,062 Annual Operations / 230,000 ASV = 3% (demand/capacity ratio)

Based on these ratios, the annual capacity of Runway 15/33 exceeds demand through the current twenty-year planning period. Hourly capacity is also expected to be adequate to accommodate normal demand. The average delay per aircraft would be expected to remain below one minute through the planning period.

Although not believed to be a current need, the addition of aircraft hold areas on Taxiway A, adjacent to Taxiway A1 or A5 should be considered as a long term improvement in the event that congestion increases significantly.

UNIQUE RUNWAY –TAXIWAY OPERATIONS AND CAPACITY CONDITIONS

It has been reported that the use of the north section of Taxiway A (north of A3) is limited for larger aircraft (typically ADG II) due to pilot concerns over wingtip clearances on the west side of the taxiway. The issues related to obstruction clearance are addressed in detail later in the chapter. However, the issue is noted in this section in the context of runway capacity and the efficiency of the existing runway-taxiway system.

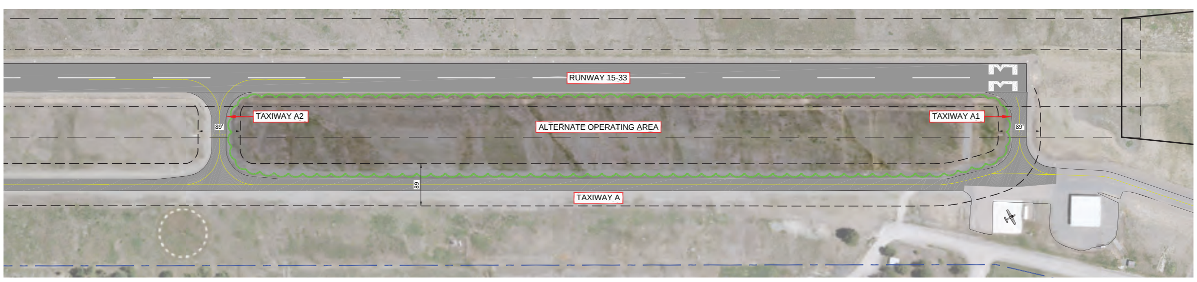
Larger aircraft reportedly use Taxiway A3 to access the runway, and back-taxi (taxiing in opposite direction of landing or departing aircraft) to Taxiway A4 (1,650 feet), or directly to the end of the runway at Taxiway A5 (1,820 feet). Aircraft then position for takeoff on Runway 15. Based on normal taxiing speeds, this would require about 1 to 2 minutes of runway occupancy time per back-taxiing aircraft. Although the low frequency of these occurrences is likely to have only a nominal effect on runway capacity, aircraft taxiing counter to the normal flow of aircraft takeoffs and landings does complicate runway operations and reduce efficiency.

ALTERNATE OPERATING (LANDING) AREA

Local pilots indicate, and ODA confirms that aircraft occasionally takeoff and land on unpaved (turf) areas adjacent to Runway 15/33. The mowed turf area is about 1,500 feet long, located from Taxiway A1 and A2, between the runway and the parallel taxiway (Taxiway A). The area is not formally identified as an alternate landing area (ALA) or airport operating area (AOA) on the current airport layout plan (ALP) and it is not referenced in the FAA Chart Supplement or the ODA Oregon Airport Directory. The majority of the aircraft operating in the area are tailwheel-equipped or otherwise capable of operating on unimproved surfaces.

The FAA's Northwest-Mountain Region Safety and Standards Branch (ANM-620) provided guidance in a March 1, 2019 Memorandum: Considerations for Alternate Operating Areas outlining steps and process for airport sponsors proposing an airport operating area (AOA) for FAA consideration, including submittal of FAA Form 7480-1, Notice for Construction, Alteration and Deactivation of Airports.

Maintaining/improving the turf operating area at Joseph State Airport was among the priority facility needs expressed by participants at Master Plan PAC Meeting #1, and through other input provided directly to ODA. The FAA guidance noted above will be used in the evaluation of a proposed AOA in the Airport Development Alternatives (Chapter 5) to be presented in PAC Meeting #3.



Source: Century West Engineering

Critical Aircraft and Airport Design Standards Discussion

Based on the current and projected level of activity described in Chapter 3, Aviation Activity Forecasts, the existing and future critical aircraft is determined. The critical aircraft establishes existing and future airport planning & design standards that will guide future planning, design, and development of the Airport.

CRITICAL AIRCRAFT AND AIRPORT REFERENCE CODE

The critical aircraft is intended to represent the most demanding aircraft using the airport on a regular basis (defined by FAA as ≥ 500 annual operations). This designation does not mean that larger aircraft cannot operate on the runway, but it does define the design guidance to be used for FAA-funded improvements.

As noted in Chapter 3, the recommended existing and future critical aircraft is the Cessna 182, a typical high performance single-engine piston aircraft, included in Airport Reference Code (ARC) of A-I (small). This ARC is an airport designation that signifies the airport's highest Runway Design Code (RDC), minus the third (visibility) component of the RDC. The "small" designation in consistent with a critical aircraft that weighs 12,500 pounds or less. The small aircraft designation is consistent with the FAA FAR Part 77 "utility" runway designation used to define airspace for the runway.

For more information see *FAA AC 150/5000-17, Critical Aircraft and Regular Use Determination,* and applicable airport planning & design standards summarized in greater detail below.

RUNWAY DESIGN CODE (RDC)

The Runway Design Code (RDC) is comprised of the selected Aircraft Approach Category (AAC), the Airplane Design Group (ADG), and the approach visibility minimums of a specific runway end. For airports with more than one runway, each runway will have its own RDC. The RDC provides the information needed to determine specific runway design standards. The approach visibility minimums refer to the visibility minimums expressed by runway visual range (RVR) values in feet. The existing and planned RDC for Runway 15/33 is A-I-VIS. For more detailed information on determining RDC see *FAA AC 150/5300-13A, Airport Design*.

APPROACH AND DEPARTURE REFERENCE CODE

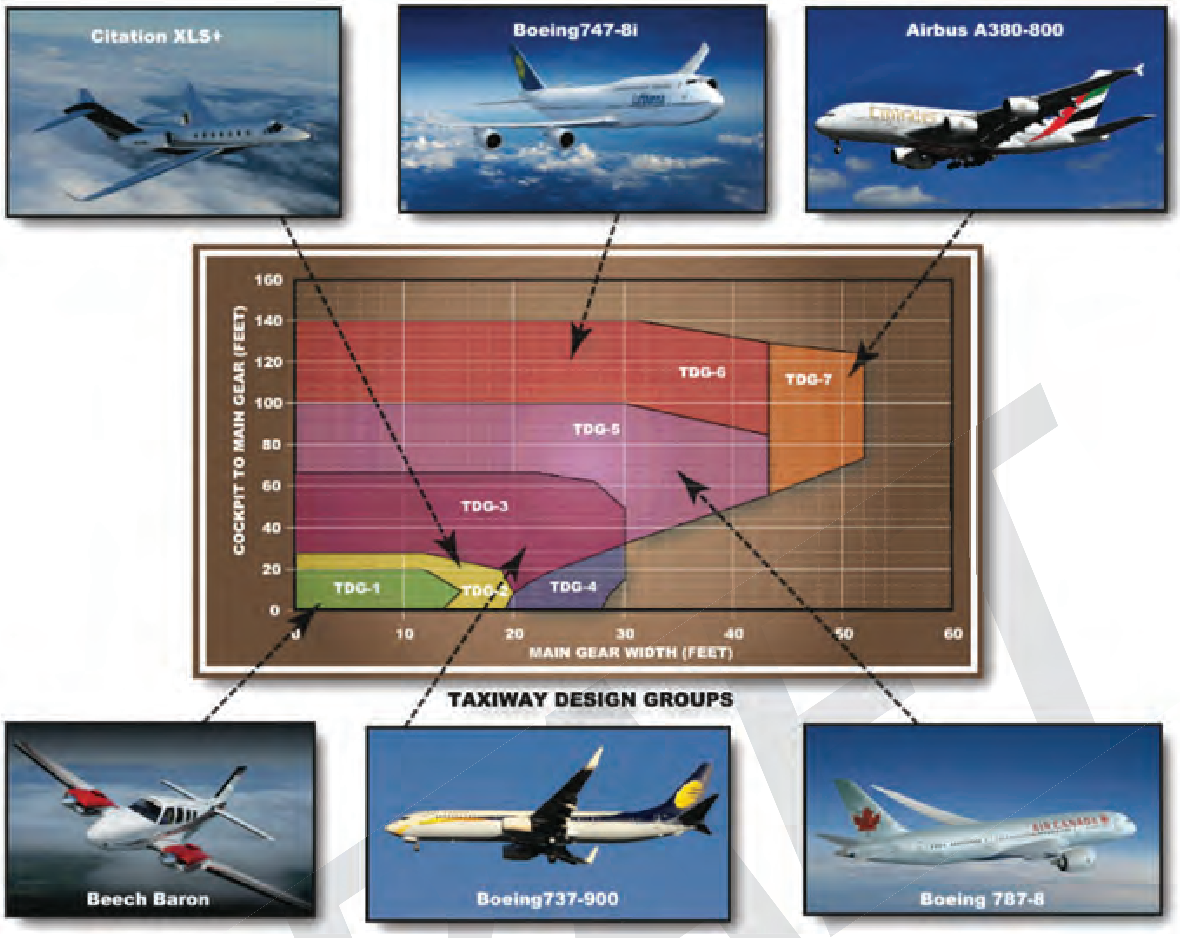
The Approach and Departure Reference Codes (APRC and DPRC respectively) represent the current operational capabilities of each specific runway end and adjacent taxiways. The approach reference code uses the performance characteristics of the design aircraft (approach speed and wingspan/tail height) and the approach visibility minimums (expressed in RVR values) and runway to taxiway separation on the airfield to define specific standards. The existing and planned APRC for Runway 15/33 is A-I (S) - VIS.

The departure reference code uses only the physical characteristics of the design aircraft and runway to taxiway separation. The existing and planned DPRC for Runway 15/33 is A-I (S). For more detailed information on determining APRC and DPRC see *FAA AC 150/5300-13A, Airport Design*.

TAXIWAY DESIGN GROUP

Taxiway Design Group (TDG), see **Figure 4-1**, is based on the 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 around the airport taxiways and dictate pavement fillet design. Taxiways and taxilanes can be constructed to different TDGs based on the expected use of that taxiway/taxilane by the design aircraft. The major taxiways at the Airport accommodate primarily ADG I aircraft, which is best represented by TDG 1.

FIGURE 4-1: TAXIWAY DESIGN GROUP COMPONENTS



Source: Century West Engineering

FAA DESIGN STANDARDS

FAA AC 150/5300-13A, Airport Design, serves as the primary reference in establishing the geometry of airfield facilities. A comparison of existing condition dimensions and design standards for the runway is summarized in **Table 4-1**. For comparison, the design standards for the next larger category of aircraft (ADG II) area also provided. This category corresponds to the aircraft such as single or multi-engine turboprops operated at the Airport, including the Pilatus PC-12 aircraft operated by Life Flight.

FAA DESIGN STANDARDS

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

TABLE 4-1: RUNWAY 15/33 AIRPORT DESIGN STANDARDS SUMMARY (DIMENSIONS IN FEET)

FAA STANDARD	RUNWAY 15/33 EXISTING CONDITIONS[1]	RUNWAY 15/33 ARC A/B-I (SMALL) NOT LOWER THAN 1-MILE OR VISUAL EXISTING/FUTURE STANDARD	RUNWAY 15/33 ARC A/B-II (SMALL) NOT LOWER THAN 1-MILE OR VISUAL COMPARISON STANDARD[2]
Runway Length	5,200	See Runway Length Analysis Discussion	
Runway Width	60	60	75
Runway Shoulder Width	10	10	10
Runway Safety Area • Width • Beyond RWY End • Prior to Landing Threshold	 120 240 240	 120 240 240	 150 300 300
Runway Obstacle Free Zone • Width • Beyond RWY End • Prior to Landing Threshold	 250 200 200	 250 200 200	 250 200 200
Object Free Area • Width • Beyond RWY End • Prior to Landing Threshold	 250 240 240	 250 240 240	 500 300 300
Runway Protection Zone Length	RWY 15: 1,000 RWY 33: 1,000	RWY 15: 1,000 RWY 33: 1,000	RWY 15: 1,000 RWY 33: 1,000
Runway Protection Zone Inner Width	RWY 15: 250 RWY 33: 250	RWY 15: 250 RWY 33: 250	RWY 15: 250 RWY 33: 250
Runway Protection Zone Outer Width	RWY 15: 450 RWY 33: 450	RWY 15: 450 RWY 33: 450	RWY 15: 450 RWY 33: 450
Runway Centerline to: Parallel Taxiway/Taxilane CL Aircraft Hold Position Aircraft Parking Area 18' Building Restriction Line (BRL)	 225[3] 125 230[4] 251[5]	 150 125 125[6] 251	 240 125 250 306[7]

Source: FAA AC 150/5300-13A, Airport Design
Table 4-1 Notes:

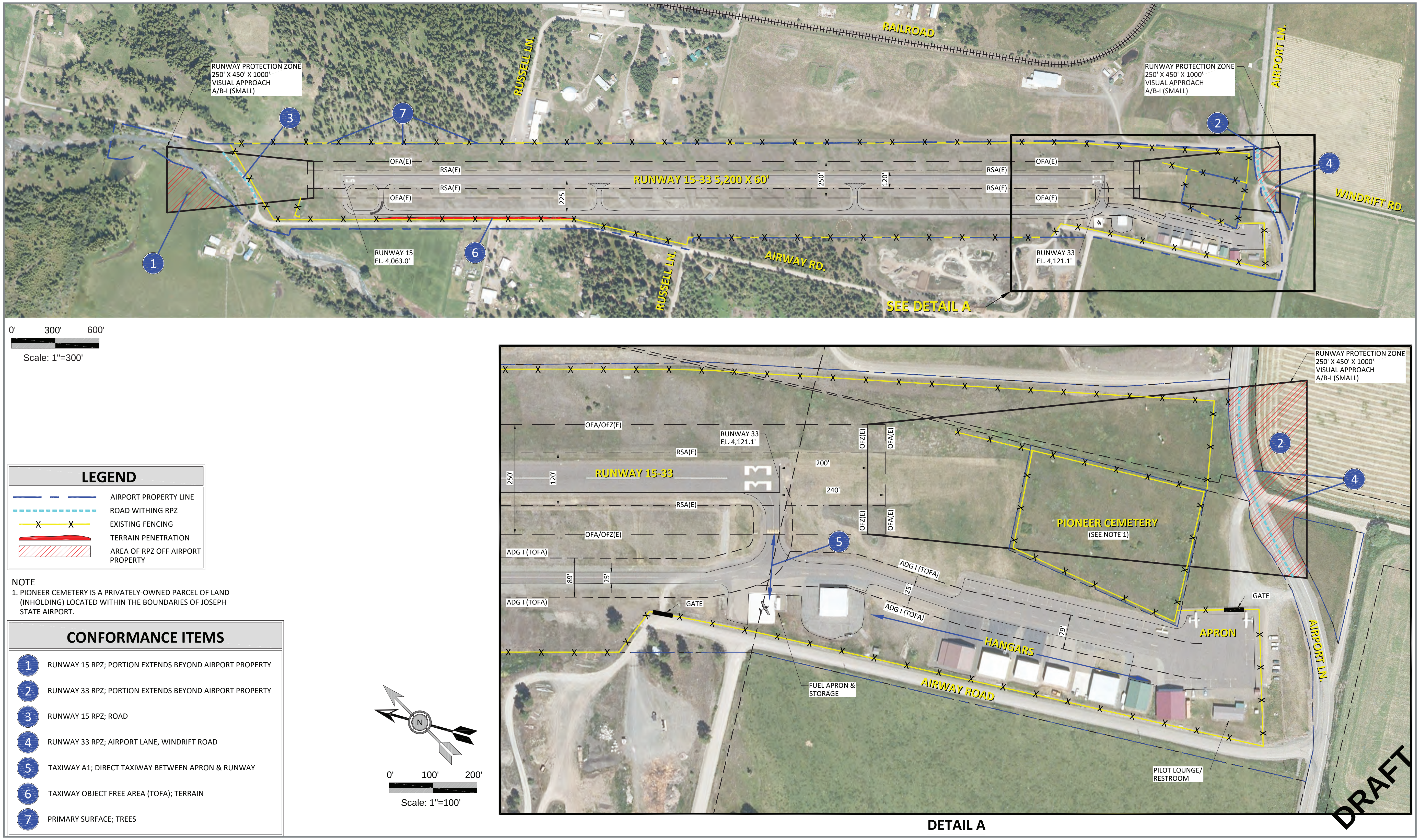
1. As depicted on most recent (2009) as-built ALP.
2. A-II (small) standards depicted for the purpose of comparison.
3. Runway centerline to parallel taxiway centerline 225 feet except the southern 180 feet which angles inward to connect to Taxiway A1 and the south apron access taxiway. The southern section of parallel taxiway has a runway separation with 205 feet at its closest point (vicinity of Runway 33 end). The south access taxiway extends beyond the south end of the runway, angling away from the runway (205 to 420 feet from runway centerline).
4. Distance between Runway 15/33 centerline and closest aircraft tiedown (position #1 @ north end of tiedown apron).
5. A 251-foot BRL for 18-foot structures is depicted on the 2009 ALP.
6. This standard applies to runways or sides of runway without a parallel taxiway.
7. A 305.5-foot BRL is required for an 18-foot structure in areas adjacent to a standard ADG II parallel taxiway and taxiway OFA (65.5' from Txy CL)

Airport Facilities Analysis

Based on the updated inventory of facilities presented in Chapter 2, existing airfield facilities were evaluated for their conformance with applicable FAA standards. Additionally, any other airport facility issues and/or opportunities that may have been identified or need to be addressed during the planning process are also depicted and discussed further within this chapter. **Figure 4-2** depicts existing airside and landside facilities conformance issues identified at Joseph State Airport.

The majority of conformance issues identified are related to the FAA's current incompatible land use policy for Runway Protection Zones (RPZ). Issues related to the configurations of runways, taxiways and apron pavements are minimal.

FIGURE 4-2: CONFORMANCE (AIRSIDE/LANDSIDE FACILITIES)



JOSEPH STATE AIRPORT

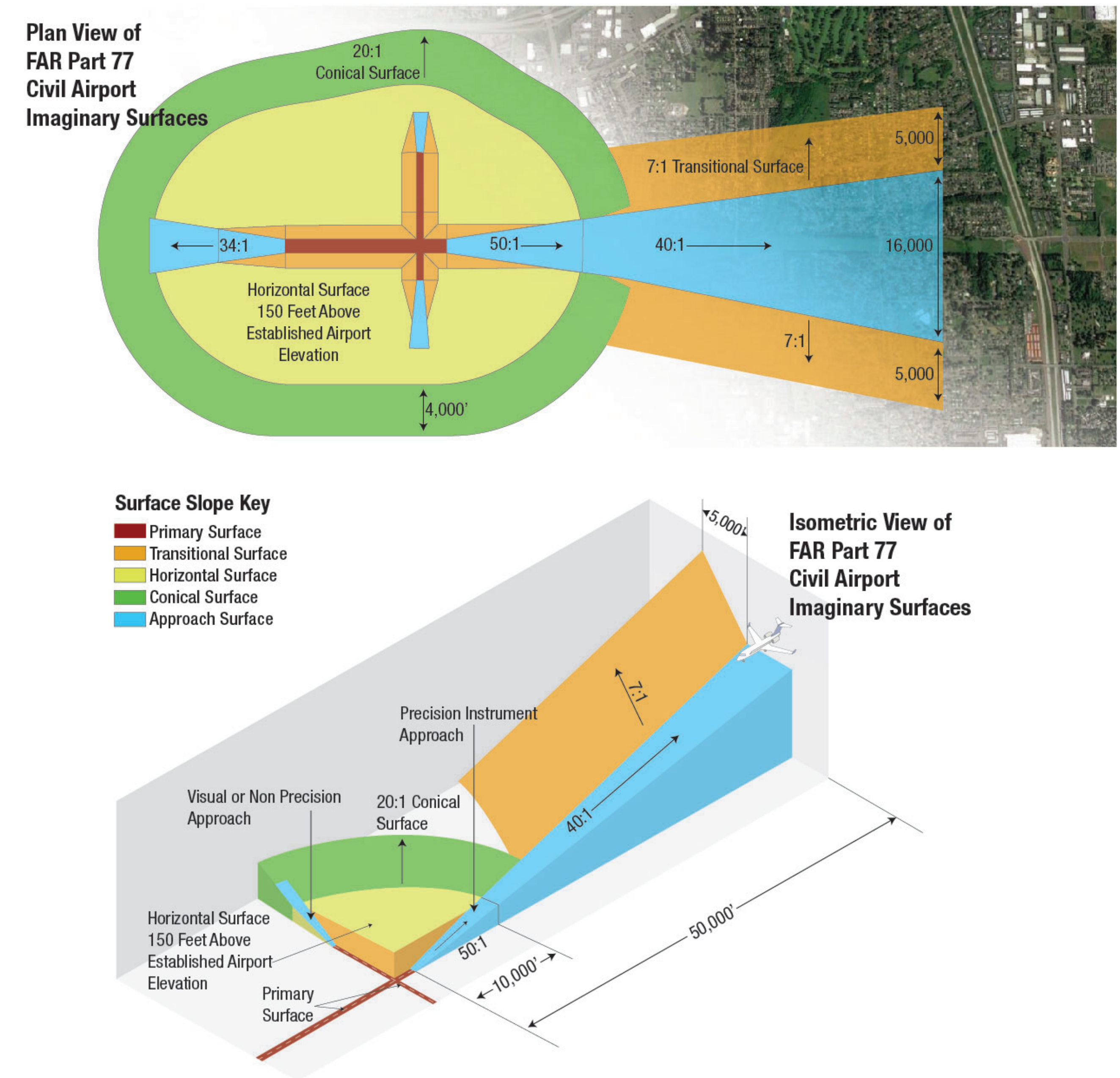
CENTURY WEST ENGINEERING

Airside Facility Requirements

FAR PART 77 AIRSPACE

U.S. airport airspace is defined by *Federal Aviation Regulations (FAR) Part 77 – Safe, Efficient Use, and Preservation of the Navigable Airspace*[1]. FAR Part 77 defines airport imaginary surfaces that are established to protect the airspace immediately surrounding a runway. The airspace surfaces and ground areas surrounding a runway should be free of obstructions (i.e., structures, parked aircraft, trees, etc.) to the maximum extent possible to provide a safe aircraft operating environment. A generic FAR Part 77 diagram illustrating each type of airspace surface is provided in Figure 4-3. Note: some of the depicted surfaces (e.g., 50,000-foot precision instrument approach surface) do not apply to Runway 15/33.

FIGURE 4-3: FAR PART 77 AIRSPACE



Source: Century West Engineering, Airspace Plan; FAR Part 77
Note: Precision approach airspace is provided for reference and is not applicable to Runway 15/33 at JSY.

1 FAR Part 77 is contained in Code of Federal Regulations (CFR), Title 14 – Aeronautics and Space, Chapter 1, Subchapter E, Part 77.

RUNWAY 15/33 INSTRUMENT APPROACH DESIGN

The definition of FAR Part 77 surfaces at an airport reflects a variety of factors, but a primary defining factor is runway category (visual, non-precision instrument, or precision instrument). Runway 15/33 is designated as a visual runway and it does not currently support instrument procedures.

Developing instrument approach capabilities at Joseph State Airport is identified as a high priority improvement in the master plan. Coordination is currently underway to obtain a preliminary assessment of approach feasibility from FAA. The airports geographic information systems (AGIS) survey, completed as part of the master plan, provides obstruction data required to support the feasibility analysis and subsequent design of instrument procedures.

Although potentially confusing, it is important to note that a non-precision instrument (NPI) approach with a circling *(or circle-to-land)* procedure can be accommodated on a visual runway, including Runway 15/33. This type of approach provides electronic course guidance to the runway environment, rather than to a specific runway end. The key distinction with a circling procedure is that the pilot must maintain visual contact with the runway environment after reaching the missed approach point, when proceeding to a runway end for landing. This type of approach requires only visual Part 77 surfaces and visual runway markings. In contrast, an NPI approach with a straight-in procedure provides electronic course guidance to a particular runway end. This type of approach requires NPI Part 77 surfaces and NPI runway markings.

Both straight-in and circling procedures typically require at least one-mile of visibility, unless the runway is equipped with an approach lighting system (ALS). Instrument departure procedures are designed based on required aircraft climb gradients and obstruction clearance standards.

An NPI circling procedure can be accommodated without any modifications to the existing airspace or markings for Runway 15/33. An NPI straight-in procedure would require a wider primary surface and shift the lateral 7:1 transitional surfaces outward on both sides of the runway, which may affect existing and future landside facilities and adjacent development. Runway markings would require upgrade to NPI. A summary of visual and NPI FAR Part 77 surface requirements for Runway 15/33 is provided in **Table 4-2**.

It is recommended that the option of upgrading the runway and airspace to NPI be evaluated in the alternatives analysis (Chapter 5). The evaluation would include the physical requirements and potential impacts on adjacent landside development (setbacks for hangars, aircraft parking, etc.) and off airport development. The FAA's assessment of approach feasibility and approximate approach minimums expected for both types of procedures will help define the incremental benefits of pursuing a more demanding approach type.

TABLE 4-2: RUNWAY 15/33 - FAR PART 77 AIRSPACE SUMMARY

	EXISTING/FUTURE Part 77 STANDARD FAA-APPROVED AIRSPACE PLAN (2001)	OPTIONAL FUTURE PART 77 STANDARD
PART 77 RUNWAY DESIGNATION	UTILITY – VISUAL (VIS)	UTILITY NON-PRECISION INSTRUMENT (NPI)
Width of Primary Surface	250 feet	500 feet
Approach Surface Length	5,000 feet	Same
Approach Surface Width (Outer End)	1,250 feet	2,000 feet
Approach Surface Slope	20:1	Same
Transitional Surface	7:1 Slope to 150 feet above runway	Same[1]
Horizontal Surface Elevation	150 feet above airport elevation	Same
Horizontal Surface Radius	5,000 feet	Same
Conical Surface	20:1 for 4,000 feet	Same

Source: Code of Federal Regulations (CFR), Title 14, Subpart E#, Part 77
Table 4-2 Note: 1. No change in 7:1 surface slope or top elevation, but the beginning of the sloped surface is shifted 125 feet further from the runway centerline, reducing vertical clearance over the ground surface and objects such as parked aircraft and hangars

RUNWAY 15/33 AIRSPACE SURFACES AND OBSTRUCTIONS

This section provides descriptions of applicable FAR Part 77 airspace surfaces for Runway 15/33. Obstruction data is currently limited to the information noted on the 1993 Airport Airspace Drawing. 2020 AGIS obstruction data developed as part of the master plan has been submitted to FAA for technical review. The FAA-accepted AGIS data will be used to populate the updated FAR Part 77 Airspace Plan, and related drawings.

The future airspace surfaces depicted on the 1993 Airspace Drawing are consistent with the current 5,200-foot runway length. The drawing identified several obstructions that were to be removed or relocated (e.g., roads) in order to extend the runway. Numerous trees were identified in the future approach surfaces. The status of previously recommended tree clearing will be updated with 2020 AGIS data. Updated obstruction descriptions will be added to this section when the draft final report is prepared for FAA review

New obstacle disposition tables will be developed for the airport layout plan (ALP) drawing set utilizing the 2020 AGIS survey data. The ALP drawing set will serve as the primary reference for future obstacle removal projects to be identified in the Capital Improvement Plan (CIP) (Chapter 8).

Approach Surface

The Approach Surface extends outward and upward from each end of the primary surface, along the extended runway centerline. The dimensions and slope of the approach surfaces are determined by the type of aircraft intended to use the runway and the most demanding approach planned for the runway.

The 1993 Airspace Plan identified groupings of “Scattered Trees” on the north and south sides of Hurricane Creek in the future Runway 15 approach surface. The recommended action included removal of trees penetrating the 20:1 approach surface on the north side of Hurricane Creek, with lower evergreens to remain. The trees identified on the south side of Hurricane Creek were recommended to be removed. No obstructions to the Runway 33 approach surface were identified. Several items including power poles and vehicles traveling on the roads within the approach surface were identified on the drawing, but did not penetrate the future approach surface.

Primary Surface

The Primary Surface is a rectangular plane longitudinally centered on the runway (at centerline elevation) extending 200 feet beyond each runway end. The width of the primary surface depends on runway category, approach capability, and approach visibility minimums. The primary surface should be free of any penetrations, except items with locations fixed-by-function (i.e., approach lighting, runway or taxiway edge lights, etc.). The outer ends of the primary surface connect to the inner portion of the runway approach surfaces.

No primary surface penetrations were identified on the 1993 Airspace Plan. The roads located beyond the previous north end of the runway were assumed to be removed or relocated prior to extending the runway.

The 2009 Airport Layout Plan includes a Modification to Standards for the primary surface (east side of runway), with penetrating trees located on the City of Enterprise Watershed property. The status of the trees and the modification to standards will be reviewed with new AGIS obstruction survey data.

Transitional Surface

The Transitional Surface is located along the lateral edges of the primary surface and is represented by a plane rising perpendicularly to the runway centerline at a slope of 7 to 1. The transitional surface extends outward and upward to an elevation 150 feet above the airport elevation. The outer edges of the transitional surface connect with the horizontal surface. The transitional surface should be free of obstructions (i.e., parked aircraft, structures, trees, terrain, etc.).

The 1993 Airspace Plan identified several groupings of trees on the east and west sides of the runway as transitional surface penetrations. The recommended action was to remove trees located on airport property that penetrate the transitional surface. The AGIS data will be reviewed to determine if any transitional surface obstructions remain.

Horizontal Surface

The Horizontal Surface is a flat plane located 150 feet above the airport elevation. The horizontal surface boundaries are defined by the radii (5,000 feet for utility runways) constructed from each runway end. The outer edges of the radii for each runway end are connected with tangent lines, which taken together define the horizontal surface.

No obstructions or areas of terrain penetration were identified on the 1993 Airspace Plan.

Conical Surface

The Conical Surface is an outer band of airspace that encircles the horizontal surface. The conical surface begins at the outer edge of the horizontal surface and extends outward 4,000 feet and upward at a slope of 20:1.

The 1993 Airspace Plan identified several areas of terrain penetration in the conical surface, south and southwest of the runway. No action was recommended for mitigating the terrain penetrations.

Airfield Pavement Strength and Condition

Airfield pavements are considered to be the single most important asset on an airport. Monitoring and planning for future improvements to the strength and condition of airfield pavements is critical to satisfying existing and future aeronautical demand.

AIRFIELD PAVEMENT STRENGTH

The published runway pavement strength rating is 12,500 pounds for aircraft equipped with single-wheel landing gear, which is sufficient to accommodate all A/B-I (small) aircraft. The pavement sections used for all taxiway and apron pavements are identical to the runway. It is recommended that pavement the strength rating of 12,500 lbs. be maintained for all airfield pavements during the planning period.

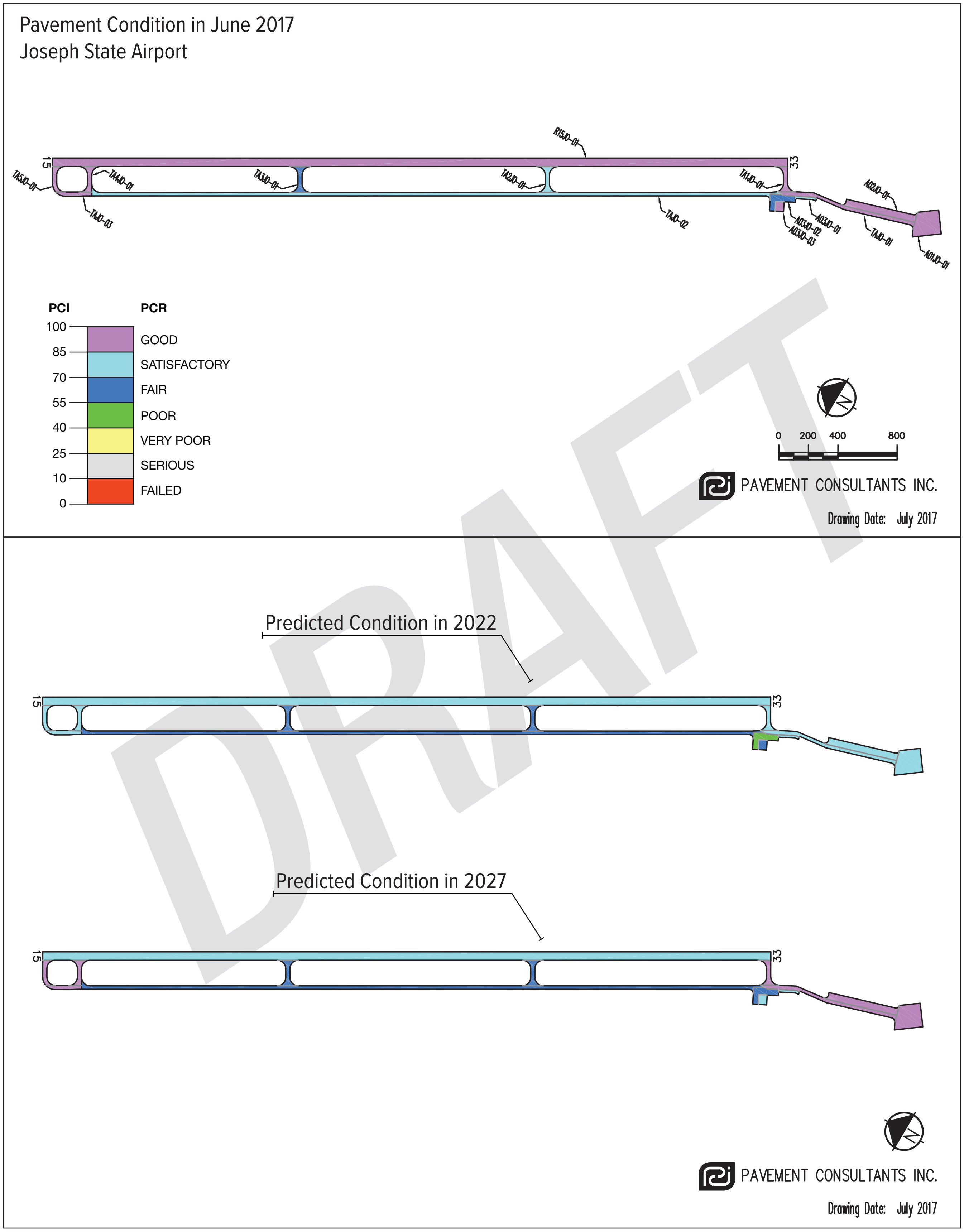
AIRFIELD PAVEMENT CONDITION

An updated Pavement Evaluation/Maintenance Management Program (PEP/PMP) inspection, performed by Oregon Department of Aviation (ODA), was conducted in 2017. A graphical depiction of 2017 pavement condition and predicted conditions for 2021 and 2026 (assuming no future pavement maintenance) is presented on the following page. A summary of pavement conditions on the Airfield provided in the 2017 pavement condition report states:

> *"Section PCIs [Pavement Condition Index] at Joseph State Airport range from a low of 67 (a PCR [Pavement Condition Rating] of "Fair") to a high of 100 (a PCR of "Good"). The area-weighted average PCI for all airport pavements is 91, corresponding to an overall PCR of "Good."*
>
> *"The primary distresses observed during the inspection of asphalt concrete pavements were: longitudinal and transverse cracking, weathering and alligator cracking. No distress was observed in the portland cement concrete pavement."*

It is expected that runway, apron, taxiway, and taxilane pavements on the airfield will require rehabilitation or reconstruction during the current planning period. A prioritized list of pavement rehabilitation or reconstruction projects will be provided in the updated capital improvement program. It is recommended that ongoing maintenance, including vegetation removal, crack filling, sealcoats, and joint repairs be conducted on a regular basis and consistent with ODA PMP to maximize the longevity of airfield pavements through the planning period.

FIGURE 4-4: PAVEMENT CONDITIONS



Source: Oregon Department of Aviation - 2017 Pavement Evaluation/Maintenance Management Program, pgs. 30 & 33

RUNWAY 15/33

Runway 15/33 was analyzed relative to runway orientation, runway length and width, and FAA design standards.

Runway Orientation and Crosswind Coverage

The preferred orientation of runways is a function of wind velocity, combined with the ability of aircraft to operate under given conditions. FAA has defined the maximum allowable direct crosswind (90-degrees) for small aircraft as 10.5 knots and 13 knots for larger general aviation aircraft.

The FAA recommends that primary runways accommodate at least 95 percent of wind conditions. When this level of wind coverage is not provided, the FAA recommends consideration of a crosswind runway.

The 1993 Joseph State Airport ALP drawing includes a wind rose that was developed with 12 months of wind data (8/85-8/86). The wind rose indicates 97.8 percent crosswind coverage for Runway 15/33 at 12 miles per hour (10.5 knots). The wind rose suggests that the current runway alignment is capable of meeting the FAA wind coverage standard, however the FAA currently requires at least ten years of documented wind data when developing a wind rose for ALP purposes. The one year of 1985-86 wind data combined with the limited data available from the Automated Weather Observation System (AWOS) at Joseph State Airport does not meet FAA requirements.

In cases where the required data are not available onsite, the FAA requires use of wind data from the nearest available airport(s). La Grande / Union County Airport (LGD), located 32 nautical miles west of Joseph State Airport, is the nearest airport with sufficient wind data. Although use of LGD wind data meets the FAA ALP Checklist requirements, it is recognized that the significant differences in terrain and localized wind conditions in Joseph and La Grande prevent a reliable evaluation of wind conditions at Joseph State Airport using LGD data. As a result, it is recommended that no changes in runway alignment or development of a crosswind runway be considered in this master plan update. ODA will be able to revisit this issue in the future as onsite wind data are collected and a new wind rose can be created.

LGD Wind Data

Data files for the LGD 2018 wind rose are currently being acquired. An evaluation of Runway 15/33 wind coverage based on LGD wind data (All Weather, VFR, and IFR) will be completed when the data are available. The tabulated wind data from LGD will be summarized in **Table 4-3** and the new wind roses will be added to the Airport Layout Plan (ALP) before submitting to FAA for review.

A preliminary review of the LGD wind rose suggests that a Runway 15/33 orientation may accommodate slightly less than 95 percent of all weather wind conditions for small general aviation aircraft. The most similar runway alignment at LGD is Runway 16/34, which is oriented within 10 degrees of Runway 15/33. The wind rose indicates that Runway 16/34 has 93.05 percent crosswind coverage at 10.5 knots.

TABLE 4-3: WIND ANALYSIS (LGD DATA)

Runway 15/33	
All Weather	
10.5 KNOTS	--.--%
13 KNOTS	--.--%
VFR	
10.5 KNOTS	--.--%
13 KNOTS	--.--%
IFR	
10.5 KNOTS	--.--%
13 KNOTS	--.--%

Source: La Grande/Union County Airport (LGD) ALP Wind Rose. National Climate Data Center AGIS Windrose (2007-2016)
Runway 15/33 Bearing = N 13° 04’ W True

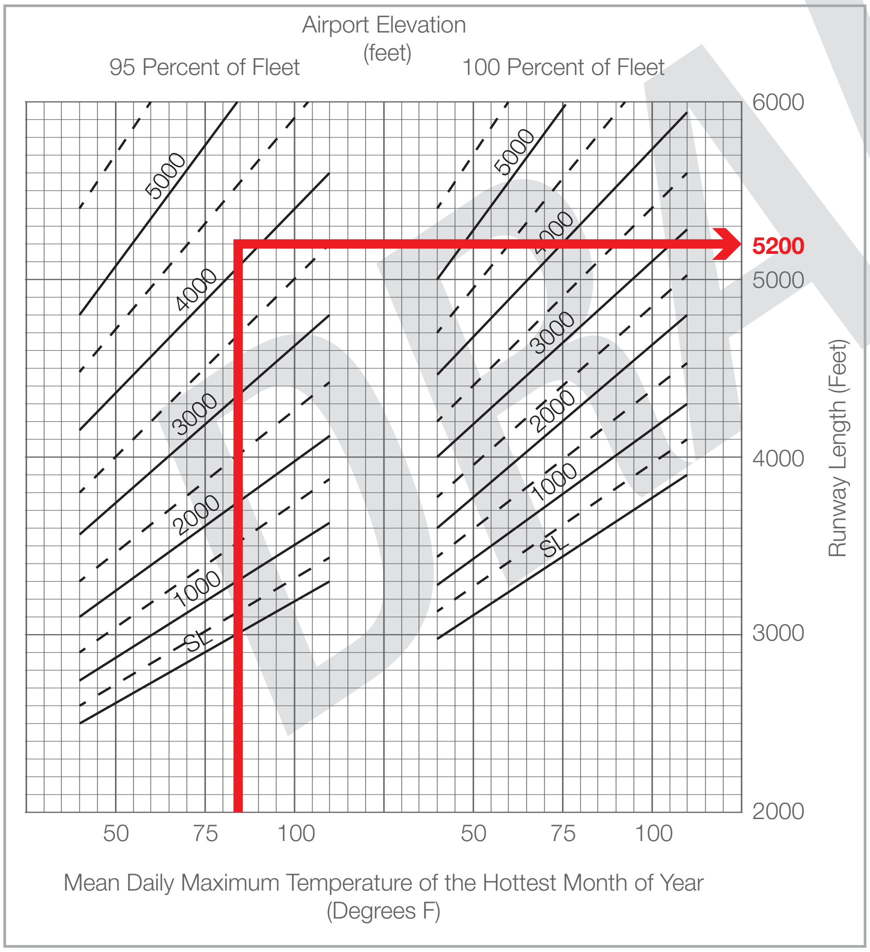
RUNWAY LENGTH

Runway length requirements are based primarily on airport elevation, mean maximum temperature of the hottest month, runway gradient, and the critical aircraft type expected to use the runway.

For general aviation airports the FAA recommends using a “family of design aircraft” approach to defining runway length requirements. *FAA AC 150/5325-4B, Runway Length Requirements for Airport Design,* provides the length analysis requirements for “small airplanes with fewer than 10 seats” that make up “95 percent of the fleet” for airports that are intended to serve medium size population communities with a diversity of usage and a greater potential for increased aviation activities.

Based on local conditions, this segment of activity requires a runway length of 5,200 at Joseph State Airport. The existing length of Runway 15/33 is 5,200 feet. No additional analysis of runway length is required based on current and forecast activity.

FIGURE 4-5: SMALL AIRPLANES WITH FEWER THAN 10 PASSENGER SEATS



Source: FAA Advisory Circular 150/5325-4B

FAA DESIGN STANDARDS

Runway Safety Area (RSA)

Standards: A/B-I (Small Aircraft) standard is 120’ wide or 60’ each side of runway centerline and 240’ beyond runway ends. Additional gradient standards apply.

Condition: The RSA for Runway 15/33 appears to meet FAA dimensional, object clearing, and grading/surface standards.

Runway Object Free Area (OFA)

Standards: A/B-I (Small Aircraft) standard is 250’ wide or 125’ each side of runway centerline and 240’ beyond runway ends. Additional gradient standards apply.

Condition: The OFA for Runway 15/33 appears to meet FAA dimensional, object clearing, and grading standards.

Runway Obstacle Free Zone (OFZ)

Standards: A/B-I (Small Aircraft) standard is 250’ wide or 125’ each side of runway centerline and 200’ beyond runway ends.

Condition: The OFZ for Runway 15/33 appears to meet FAA dimensional and obstacle clearing standards.

Runway Protection Zones (RPZ)

In October 2012, the FAA released interim guidance regarding RPZs and incompatible land uses, with a particular focus on roads. This guidance directs airport sponsors to evaluate any planned changes to existing RPZs that introduce or increase the presence of roads in RPZs. Existing roads within RPZs are also to be evaluated during 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 Airports District Office has subsequently indicated that the primary focus of this policy is related to proposed changes to RPZs—as the result of a 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 configuration of the runway that changes the location of existing RPZs evaluated in this study are subject to review by FAA headquarters in Washington D.C.

It is recommended the RPZ alternatives for each runway end be considered in the airside alternatives analysis. Although the current FAA prioritization for removing existing roads in RPZs is low when no changes in runway length or RPZ size are planned, an evaluation of options will provide an assessment of feasibility to address this standard.

Runway Width/Shoulders

Runway 15/33 is 60 feet wide, which meets the dimensional standard for ARC A/B-I (small) with current visual approach visibility minimums or visibility minimum not lower than ¾-mile. The existing 10-foot gravel shoulders meet standards.

As noted earlier, a turf area located between the runway and Taxiway A (between A1 an A2) is occasionally used for aircraft takeoffs and landings. The area is partially within the graded runway safety area, but is not a designated landing area. Pilots use the area at their own risk.

FAA DESIGN STANDARDS

Runway Protection Zone (RPZ)

Standards: A/B-I (Small Aircraft) Visual RPZs and RPZs with minimum approach visibilities as low as ¾-mile comprise 8.035 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.

Condition: Both Runway 15 and 33 RPZs extend beyond Airport property and have public roads within their boundaries. Easements have been acquired for privately owned parcels located within the RPZs. The Pioneer Cemetery is a privately-owned inholding located within airport property. A portion of the cemetery is located in the Runway 33 RPZ. The status of easements for county roads traveling through the RPZs will be reviewed.

FAA DESIGN STANDARDS

Runway Width/Shoulders

Standards: A/B-I (Small Aircraft) standard runway width for runways with visual or not lower than 1-mile visibility is 60'. The standard is 10' for shoulders.

Condition: Existing Runway 15/33 width is 60' which meets standards. The 10' gravel shoulders meet standards.

FAA DESIGN STANDARDS

Taxiway Width/Shoulders

Standards: Taxiway Design Group 1 (TDG 1) standard width is 25' with 10' shoulders.

Condition: Existing Taxiway A width is 25' which meets standards. The 10' gravel shoulders meet standards.

Taxiway Edge Safety Margins (TESM) Standards: The TDG 1 standard is 5' per side.

Condition: Existing Taxiway A, A1-A5 meet the TESM standard for TDG 1.

TAXIWAY/TAXILANE NETWORK

Taxiways

Taxiway A and the five exit taxiways (A1-A5) are designed based on ARC A/B-I (Small Aircraft) standards. With the exception of the TOFA for Taxiway A described later in this chapter, the taxiways meet or exceed dimensional standards.

Issues related to specific taxiway components are described below.

Taxiway A1

The configuration of Taxiway A1 and its proximity to the adjacent aircraft fueling apron has been identified for review based on current FAA design guidance (described in the sidebar).

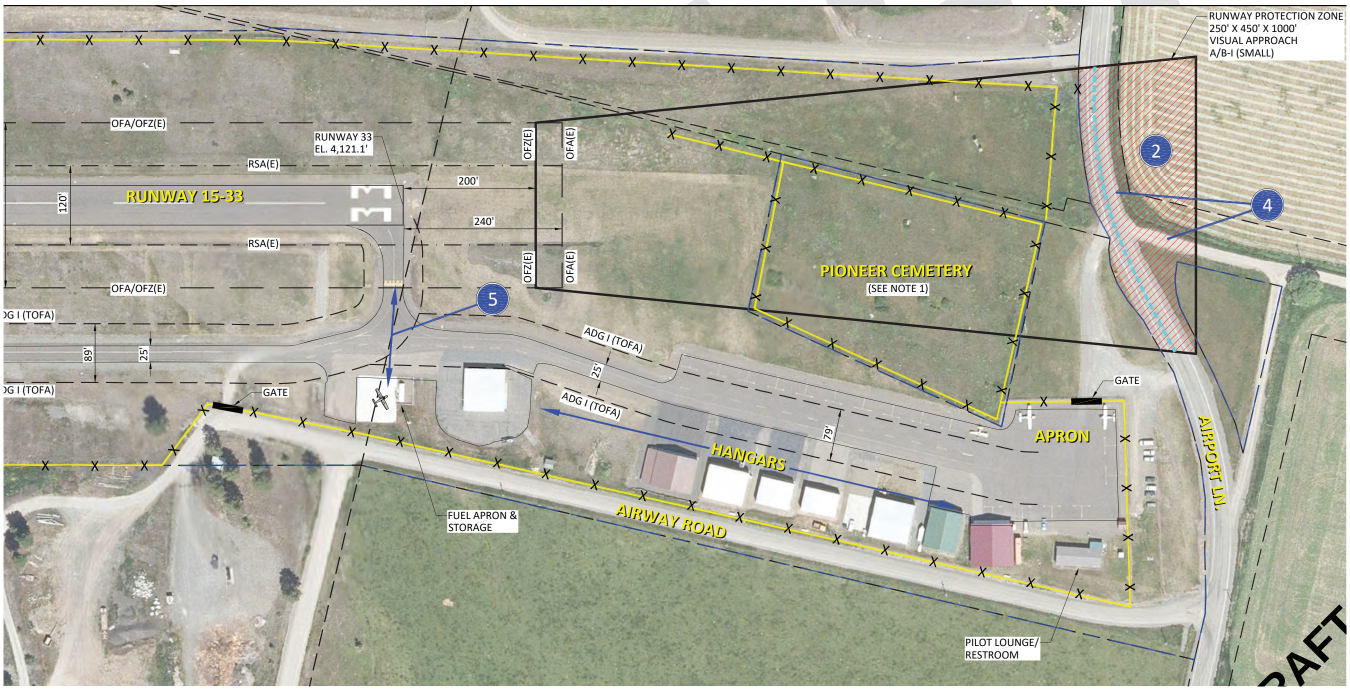
ADDITIONAL FAA TAXIWAY AND TAXILANE DESIGN GUIDANCE

(AC 150/5300-13A, CHAPTER 4, SECTION 401. GENERAL, DESIGN METHOD)

(5) Runway Incursions.

(g) Indirect Access
Do not design taxiways to lead directly from an apron to a runway without requiring a turn. Such configurations can lead to confusion when a pilot typically expects to encounter a parallel taxiway but instead accidently enters a runway.

Condition: The existing aircraft fueling apron is located directly opposite (west) of Taxiway A1, which provides direct access to the Runway 33 threshold.



See Figure 4-2 for legend and full runway length.

South Access Taxilane

Figure 4-2, presented earlier, depicts the south apron/hangar area and the south access taxilane. The 2009 ALP depicts aircraft parking lines (APLs) on both sides of the south access taxilane with 39.5-foot setbacks from centerline. This dimension represents one-half of the 79-foot ARC A/B-I (small) Object Free Area (OFA) standard for taxilanes. The top of the tiedown "T" markings are located about 44 feet from taxilane centerline, which provides approximately 4.5 feet of clearance from the adjacent TOFA edge. It is observed that the front portion of aircraft may occasionally protrude across the unmarked edge of the TOFA, depending on the aircraft size or exact position when parked. The addition of an aircraft parking setback line marking should be considered to improve pilot recognition of the desired taxilane clearance.

Parallel Taxiway Object Free Area (TOFA)

A review of preliminary AGIS survey data indicates a narrow strip of terrain penetrates the outer edge of the ADG I taxiway object free area (TOFA) for Taxiway A, from about 150 feet north of A3 to near the end of the taxiway at A5. The sloping embankment rises 2 to 4 feet above the adjacent taxiway centerline. The 6-foot airport fence is located 50 feet from Taxiway A centerline at its nearest point and runs parallel to the taxiway. The fence and the adjacent section of Airway Road are located outside the ADG I TOFA (both on airport property).

Photo: Century West Engineering

Photo: Century West Engineering

FAA DESIGN STANDARDS

Runway – Parallel Taxiway/Taxilane Separation

Standards: A /B-I (Small Aircraft) standard is 150' centerline-to-centerline separation between runway and parallel taxiway for visual runways and runways with visibility minimums not lower than ¾-mile.

Condition: Runway to parallel taxiway separation is 225 feet, except for a 175-foot section of the taxiway at its south end that angles toward the runway, reducing the runway separation to 200 feet at its nearest point. The full length of Taxiway A exceeds the defined standard for runway separation.

Taxiway Safety Area (TSA)

Standards: The ADG I standard is 49' wide, or 24.5' each side of taxiway centerline along the sides the taxiway. Additional gradient standards apply.

Condition: The existing TSA for Taxiway A and A1-A5 meets ADG I dimensional standards; grading and obstruction clearing standards to be verified with FAA-accepted AGIS data.

Taxiway Object Free Area (TOFA)

Standards: The ADG I standard is 89' wide, or 44.5' each side of taxiway centerline.

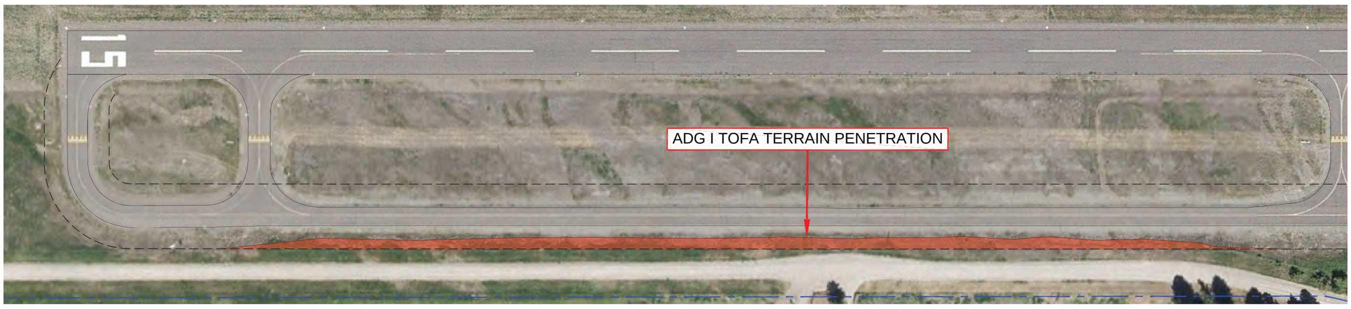
Condition: The existing Taxiway A TOFA meets FAA dimensional standards. The northern section of Taxiway A has an area of penetrating terrain, north of Taxiway A3. Overall grading and obstruction clearing standards to be verified with FAA-accepted AGIS data.

Taxilane Object Free Area (TOFA)

Standards: The ADG I standard is 79' wide, or 39.5' each side of taxilane centerline.

Condition: The existing south apron access taxilane meets FAA dimensional criteria and obstruction clearance to the adjacent tiedowns and hangars. See recommendations later in this section for compliance with taxilane clearance.

ADG I Aircraft

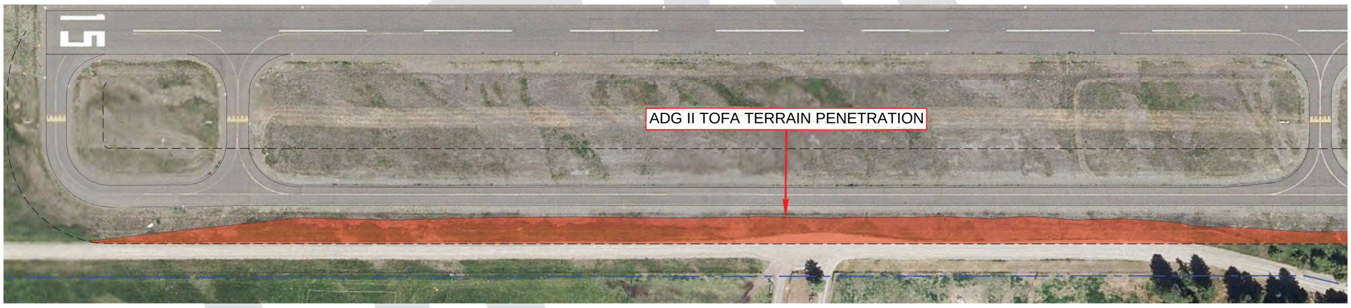


Source: Century West Engineering, 2020 AGIS survey

As noted earlier, airport management reports that some larger aircraft (primarily ADG II) bypass the north section of parallel taxiway (north of Taxiway A3) due to concerns about wingtip clearance along the taxiway's west side. Currently, landing aircraft on Runway 33 (taxiing back to parking at south end of Taxiway A) and departing aircraft on Runway 15 are affected. These aircraft use Taxiway A3 as the primary route between the north end of the runway and parallel taxiway, and back-taxi on the northern 1,750 feet the runway.

It is not known to what extent clearing the ADG I TOFA penetrations noted above will address larger aircraft use of the taxiway. The AGIS survey data indicates that the equivalent of an ADG II TOFA is obstructed along the majority of Taxiway A. The airport fence obstruction is limited to only the northern section that closely parallels the taxiway (50 feet from taxiway centerline), north of Taxiway A3. Although the Airport is not obligated to mitigate obstructions to ADG II surfaces based on its ADG I critical aircraft designations, regular use by ADG II aircraft, including medevac aircraft, suggests that the activity creates a significant operational issue that may need to be addressed.

ADG II Aircraft



Source: Century West Engineering, 2020 AGIS survey

Taxiway Recommendations

Based on the evaluation of existing taxiways and taxilanes the following recommendations are presented:

- The surveyed terrain obstructions within the ADG I TOFA for Taxiway A should be removed.
- Facility and/or operational options for Taxiway A should be explored for larger aircraft operations as part of the airside alternatives evaluation. Options may include, but are not limited to, improving obstruction clearance (grading, relocation of the fence, road, etc.) or restricting large aircraft use of the north section of Taxiway A in airport facility guides (FAA Chart Supplement, etc.).
- The configuration of Taxiway A1 and the adjacent fueling apron should be reviewed in the airside alternatives evaluation to address the FAA's Indirect Access standard for Runway Incursions. The relationship between the fueling apron and the runway-taxiway system should also be reviewed in the landside alternatives to determine if relocation options exist, in addition to potential changes in runway-taxiway configuration.
- The addition of "aircraft parking line" pavement markings should be considered along both sides of the South Access Taxilane to define setbacks for adjacent parked aircraft based on the 39.5' setback ADG I from taxilane centerline.

Landside Facility Requirements

Landside facilities include aircraft parking apron(s), hangars, terminal, fixed base operator (FBO) facilities, and surface access and automobile parking.

Landside facility requirements were analyzed relative to existing hangar siting, apron and aircraft parking requirements, runway access, and FAA design standards. Future facility demand is derived from the updated aviation activity forecasts presented in Chapter 3.

> **FAA DESIGN STANDARDS**
>
> **Aircraft Parking Area**
> **Standards:** A/B-I (Small Aircraft) runway centerline to aircraft parking area standard is 125'. This dimension may be increased to account for taxiway setbacks.
>
> **Condition:** All aircraft parking areas are beyond the standard parking separation requirement.

AIRCRAFT PARKING APRON

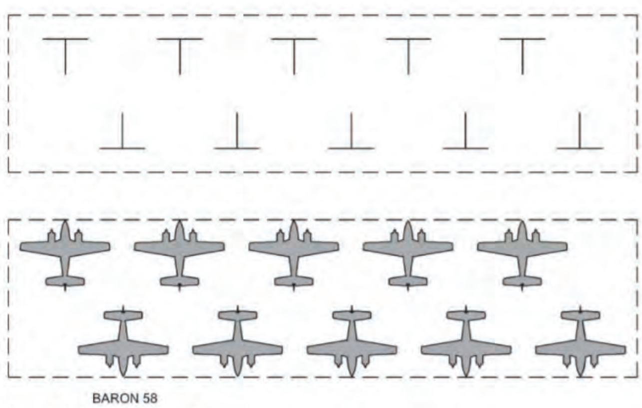
The aircraft parking apron facility requirements were analyzed relative to existing FAA apron and aircraft parking requirements analysis provided in *FAA AC 150/5300-13A, Airport Design,* and facility needs depicted in **Table 4-4: Apron and Hangar Facility Requirements**.

Based and Itinerant Aircraft Parking

The configuration of existing aircraft parking areas and tiedowns are designed to meet the ADG I taxilane object free area (TOFA) clearing standard for the access taxilane serving the Airport's south apron and hangar area.

To quantify the based and transient aircraft parking needs/requirements depicted in Table 4-4, the based aircraft forecasts and average day of the peak month Aviation Activity Forecasts were used to determine the parking spots necessary to satisfy existing and future demand.

Although not specifically defined in current FAA general aviation apron design criteria, the FAA's previous long-established planning standard of 300 square yards for each based aircraft and 360 square yards for transient aircraft was used to calculate apron space requirements for long-term planning purposes.



Source: Delta Airport Consultants, Inc.

Generic parking area for 10 tiedown positions (note: single tiedown row configuration used at JSY)

Space requirements for transient business aircraft and helicopter parking were estimated based on typical configurations. The evaluation of apron configurations in the Airport Development Alternatives (Chapter 5) will reflect the aircraft using the facility, consistent with current FAA design guidance:

> *A5-2. General aviation apron. a. General. Aprons and associated taxilanes should be designed for the critical design aircraft and/or the combination of aircraft to be using the facility. Itinerant or transient aprons should be designed for easy access by the aircraft under power.*[2]

Historically the number of based aircraft parked on the apron full time has been low, about 10 percent or less. Currently, one of the Airport's twelve based aircraft is parked on the aircraft apron (8 percent), with the remaining aircraft stored in hangars. Seasonal use of the apron increases for aircraft that may be located at the airport for

TABLE 4-4: APRON AND HANGAR FACILITY REQUIREMENTS SUMMARY

ITEM	BASE YEAR (2019)	2025	2030	2035	2040
Based Aircraft Forecast	12	13	15	16	18
Aircraft Parking Apron - Existing Aircraft Parking Type/Capacity					
Existing Tiedown Apron[1]	6,300 sy				
Existing Aircraft Fuel Apron[1]	470 sy				
Small & Large Aircraft Parking	19 Tiedowns				
Transient Helicopter Parking[2]	0				
Projected Needs (Gross Demand)[3, 4]					
Locally Based Tiedowns (@ 300 SY each)	1 space / 300 sy	1 space / 300 sy	1 space / 300 sy	1 space / 300 sy	1 space / 300 sy
Small Airplane Itinerant Tiedowns (@ 360 SY each)	3 spaces / 1,080 sy	4 spaces / 1,440 sy	4 spaces / 1,440 sy	4 spaces / 1,440 sy	5 spaces / 1,800 sy
Business Aircraft Parking Positions (@ 625 SY each)	1 space / 625 sy	1 space / 625 sy	1 space / 625 sy	1 space / 625 sy	1 space / 625 sy
Small Helicopter Parking Positions (@ 380 SY each)	1 space / 380 sy	1 space / 380 sy	1 space / 380 sy	1 space / 380 sy	1 space / 380 sy
Aircraft Fueling Apron	1 space / 470 sy	1 space / 470 sy	1 space / 470 sy	2 spaces / 940 sy	2 spaces / 940 sy
Total Apron Needs	**7 spaces / 2,855 sy**	**8 spaces / 3,215 sy**	**8 spaces / 3,215 sy**	**9 spaces / 3,685 sy**	**10 spaces / 4,045 sy**
Aircraft Hangars (Existing Facilities)					
Existing Hangar Units/Aircraft Storage Capacity (23,040 SF)	11 Units[5]				
Projected Needs (Net Increase in Demand)[6]					
(New) Hangar Space Demand (@ 1,800-5,000 SF per space)[7] (Cumulative twenty-year projected demand: 6 Units / 18,200 SF)		1 Unit / 2,000 sf	2 Units / 4,200 sf	1 Unit / 5,000 sf	2 Units / 7,000 sf

Source: Century West Engineering
Table 4-1 Notes:
1. Apron pavement area as defined in ODA Pavement Management Plan database.
2. No designated helicopter parking spaces; helicopter parking is accommodated within the existing apron.
3. Current and forecast demand does not include fire-related helicopters that are parked on/adjacent to parallel taxiway during emergency flight operations.
4. Apron parking demand levels identified for each forecast year represents estimated gross demand.
5. Nine (9) existing hangars including one multi-unit hangar (4 spaces/3,840 SF) and 8 small/medium conventional hangars (19,200 SF). Total hangar area is estimated at 23,040 square feet, which currently accommodate 11 aircraft. Current average hangar space per aircraft stored is 1,920 square feet.
6. Aircraft hangar demand levels identified for each forecast year represent forecast cumulative demand; assumed 95% of new based aircraft will be stored in hangars.
7. Hangar square footage approximated by type/size of aircraft and reflects existing hangar development patterns at JSY.

2 FAA AC 150/5300-13A, Appendix 5. General Aviation Aprons and Hangars

extended periods. For planning purposes, it is estimated that 10 percent of future based aircraft would be parked on the apron full-time and 90 percent stored in hangars.

Using this ratio, it is estimated the Airport will need to provide apron parking for approximately 1 based aircraft through the 20-year planning period. The 'extended-stay' aircraft activity will be captured in higher assumed utilization during peak periods.

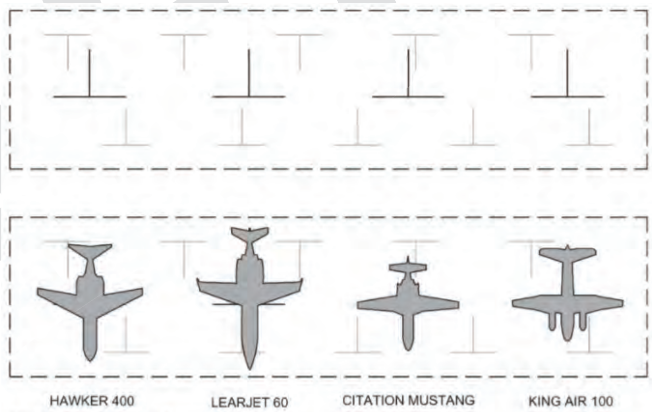
Transient aircraft parking needs were developed from the average peak day forecast data presented in Chapter 3 – Aviation Activity Forecasts. Transient aircraft parking requirements are estimated to be 60% of the itinerant operations of the average peak day of the peak month. Using this formula, it is estimated the Airport will need to provide parking for approximately 7 itinerant aircraft at the end of the 20-year planning period. This projection reflects normal busy days, but does not reflect demand created by events such as the annual two-day fly in or the fire related helicopter activity that is managed separately from normal aircraft parking areas.

Based on the overall demand projections, the existing 19 small aircraft tiedowns appear to be adequate to meet small airplane parking needs through the current planning period. However, the addition of specific types of aircraft parking (transient business aircraft and helicopter) should be addressed in the landside development alternatives analysis. The current use of the aircraft fueling apron to large aircraft parking should also be evaluated. It is noted that potential changes in apron configuration to accommodate different aircraft requirements may reduce current capacity. See Table 4-4 for parking requirements by aircraft type.

Business Aircraft Parking

The standard parking area layout dimensions for ADG I aircraft provided in *FAA AC 150/5300-13A, Airport Design,* would accommodate the existing design aircraft, the Airport's smaller fleet, as well as the occasional business aircraft when drive-through parking can be accomplished through the parking rows. The conceptual parking area dimensions required to provide adequate parking clearances for larger business or medevac aircraft is depicted in the diagram to the right.

All existing small aircraft tiedowns at Joseph State Airport are tail-in due to the narrow configuration of the aircraft apron. The result is that the useable apron area located beyond the adjacent taxilane object free area is approximately 20 feet, which is not adequate to accommodate most business class aircraft. The fuel apron is occasionally used to park business aircraft that cannot be accommodated on the south apron.



Note: The lighter lines depict the nested tiedown positions available for small aircraft
Source: Delta Airport Consultants, Inc.

Typical parking layout for small AC tiedown positions marked for larger aircraft.

It is recommended that planning for one business/medevac aircraft parking position be included apron layout alternatives. Options may include reconfiguring the main section of the existing apron or adding new apron. The new parking position would replace use of the fuel apron for business aircraft parking. It is recommended that the business aircraft parking areas be designed to accommodate the ADG II aircraft that utilize the Airport, although the ADG I taxilane access should be adequate for limited ADG II use.

Helicopter Parking

Joseph State Airport does not have designated helicopter parking areas. Transient helicopters, including medevac helicopters normally parking on the main apron or at the aircraft fueling apron. Firefighting helicopters that operate at the Airport during fire emergencies stage their aircraft on a section of the parallel taxiway (closed by notice to airmen (NOTAM)).

It is recommended that planning for one small helicopter parking position be included apron layout alternatives.

Fire Operations Staging/Helicopter Parking


Photo: wallowalakefire.blogspot.com

The seasonal helicopter operations managed by the US Department of Agriculture-Forest Service (USDA-FS) during emergency fire response conditions use a section of Taxiway A to park aircraft, with support equipment staging in the areas adjacent to the taxiway. As noted in the forecast chapter, fire-related helicopter activity at Joseph State Airport is expected to be maintained at current levels for the foreseeable future.

For long-term planning purposes, it is recommended that the Airport consider evaluating the overall needs, including development footprint, of a helicopter operations area that would include parking for aircraft and staging areas for ground support. The facility would also support other local emergency response activities in Wallowa County.

The development of an emergency operations area would allow Taxiway A to remain in use during active operations. Consultation with the USDA-FS is required to verify specific facility needs.

AIRFIELD INSTRUMENTATION, SIGNAGE, LIGHTING, AND MARKINGS

Runway & Taxiway Lighting

The runway lighting systems associated with Runway 15/33 and described in Chapter 2 – Inventory are in good condition. Lighting systems are typically replaced every twenty years, although some systems remain reliable, serviceable, and fully functional for longer periods. For planning purposes, the assumed useful life of airfield lighting systems is twenty years. Replacement for existing systems will be included in the twenty-year capital improvement program, as appropriate.

Runway 15/33 is equipped with Medium Intensity Runway Lighting (MIRL), which consists of edge and runway threshold lights. Runway 15 is equipped with Runway End Identifier Lights (REIL). Both runway ends are equipped with Precision Approach Path Indicators (PAPI), the FAA's current standard for Visual Guidance Indicators (VGI).

The taxiways at the Airport are equipped with blue retroreflective edge markers, which appear to be adequate for current use. Heavy winter snows make plowing around edge lights and reflectors challenging and damage is common, which makes reflectors a relatively cost-effective option. However, the Airport could consider installation of Medium Intensity Taxiway Lights (MITL) if pilot visibility at night needs to be enhanced.

It is recommended that existing runway lighting be maintained and updated accordingly based on function and operating reliability. A transition to LED lighting may also be considered in future projects. Adding MITL to Taxiway A, A1-A5 is optional.

Runway Markings

The runway markings at the Airport as noted in the Inventory Chapter are consistent with FAA standards for color (white), configuration, and current approach type and are considered to be in good condition.

The existing basic/visual markings are consistent with FAA requirements for both visual approaches and non-precision instrument (NPI) approaches with circling (or circle-to-land) procedures. A future NPI approach with a straight-in procedure would require NPI runway markings (threshold and aiming point markings). It is recommended that runway markings be maintained consistent with the type of instrument approach developed for the Airport, and consistent with the ODA Pavement Maintenance Program.

Taxiway Markings

The taxiway markings at the Airport are consistent with FAA standards for color (yellow) and configuration and are considered to be in good condition. It is recommended taxiway markings be maintained consistent with the ODA Pavement Maintenance Program.

Airfield Signage

The runway/taxiway hold position signs and taxiway location signs at the Airport are consistent with FAA standards for color and configuration and are considered to be in good condition. It is recommended that airfield signage be maintained and updated accordingly based on condition. Internally illuminated signage may be considered, although the durability and simplicity of maintenance for reflective signage provides significant value.

Photo: Century West Engineering

Airfield Lighting

The airfield lighting systems (airport beacon, primary wind cone, visual guidance systems, etc.) meet standards for location, type, and color. It is recommended that existing airfield lighting be maintained and updated accordingly based on function and operating reliability. A transition to LED lighting may also be considered in future projects.

AIRCRAFT HANGARS

11 of the Airport's current 12 based aircraft are stored in hangars (92 percent). The Airport currently has 8 hangars, including 1 multi-unit hangar and 7 small/medium conventional hangars. The 8 existing hangars currently accommodate 11 based aircraft in approximately 23,040 square feet. This includes the individual spaces in the multi-unit hangar (3,840 SF) and the total storage space (19,200 SF) in the 7 conventional hangars. The local preference toward conventional hangars rather than multi-unit hangars results in a current average of nearly 2,100 square feet per hangared aircraft. It is recognized that the space allocated to aircraft storage will often be lower, particularly for maintenance hangars.

For planning purposes it is assumed that 90% of the Airport's future based aircraft will be stored in hangars with the remaining 10% parked on the apron. This will ensure that adequate apron space is available for future based aircraft demand. In effect, all of the forecast net increase in based aircraft will require hangar space and 17 of the 18 based aircraft forecast for 2040 will be hangared.

The evaluation of future hangar requirements is presented as general square footage based on common sizes and configurations of different hangar types and aircraft sizes. Demand for new hangar space (aircraft storage only) is estimated to be 6 spaces (rounded up) totaling approximately 18,200 square feet over the 20-year planning period. A planning standard of 1,800 to 5,000 square feet per based aircraft stored in hangars is used to project gross space requirements. The variation in space requirements reflects different aircraft types. The current hangar area (23,040 SF) averages just under 2,000 square feet per hangared aircraft. The projected hangar storage requirements are included in Table 4-4, presented in the previous section.

It is recommended that space adequate to accommodate forecast demand for general aviation hangars, and a 50 to 100 percent hangar development reserve, be defined during the landside development alternatives process. The evaluation will define the maximum hangar development capacity within existing airport property based on required development setbacks and aircraft operational requirements.

GA TERMINAL/PILOT LOUNGE

The existing airport pilot lounge provides a restroom and an indoor waiting area. The building is an older double-wide mobile home that is expected to require replacement in the current planning period. The building is located near the southwest corner of the south apron. A review of the existing developable lands in the terminal area will be performed as part of the landside alternatives evaluation to identify potential hangar sites. The location, size and configuration of the pilot lounge, and its septic system will be included in that review.

It is recommended that space adequate to accommodate a replacement Americans with Disabilities Act (ADA)-accessible pilot building/GA terminal with a public restroom be defined during the landside development alternatives process.

SURFACE ACCESS AND VEHICLE PARKING

Vehicle access to Joseph State Airport is provided at the south end from Airport Lane, and the north entrance accesses the Airport on the west side, just north of the corner of Juniper Road and Airway Road.

The south airport entrance road provides direct access to the vehicle parking, the apron, pilot lounge, hangars, and the Pioneer Cemetery. The west entrance is also used to access the landside facilities, although the gravel road connects directly to the parallel taxiway, just north of the fuel apron. The configuration of the west access road and gate requires a tight turn for trucks and larger vehicles. A reconfiguration of the roadway should be considered in conjunction with the installation of a new automated vehicle gate.

It is recommended both existing automobile access points, and existing parking facilities be maintained and improved as required. The configuration of the west access road and gate requires a tight turn for trucks and larger vehicles. A reconfiguration of the roadway should be considered in conjunction with the installation of a new automated vehicle gate.

Support Facilities Requirements

Support Facilities such as aircraft fueling, security/perimeter fencing, and utilities were also examined.

FUEL FACILITIES

As described in Chapter 2 – Inventory and Existing Conditions, ODA owns one aboveground fuel tank and dispensing system. The capacity of the 100LL AVGAS tank appears to be adequate for forecast demand during the current planning period.

The recommended evaluation of Taxiway A1 and the adjacent fueling apron may affect the existing installation. It is recommended that the operational efficiency of the aircraft fueling apron and tank be preserved in the alternatives evaluation of adjacent taxiways.

Photo: Century West Engineering

UTILITIES

The existing airport utilities as discussed in the Inventory Chapter appear to be adequate to support future development in the east landside development area of the airport. It is recommended the existing utilities be maintained and extended as required to accommodate new development throughout the planning period.

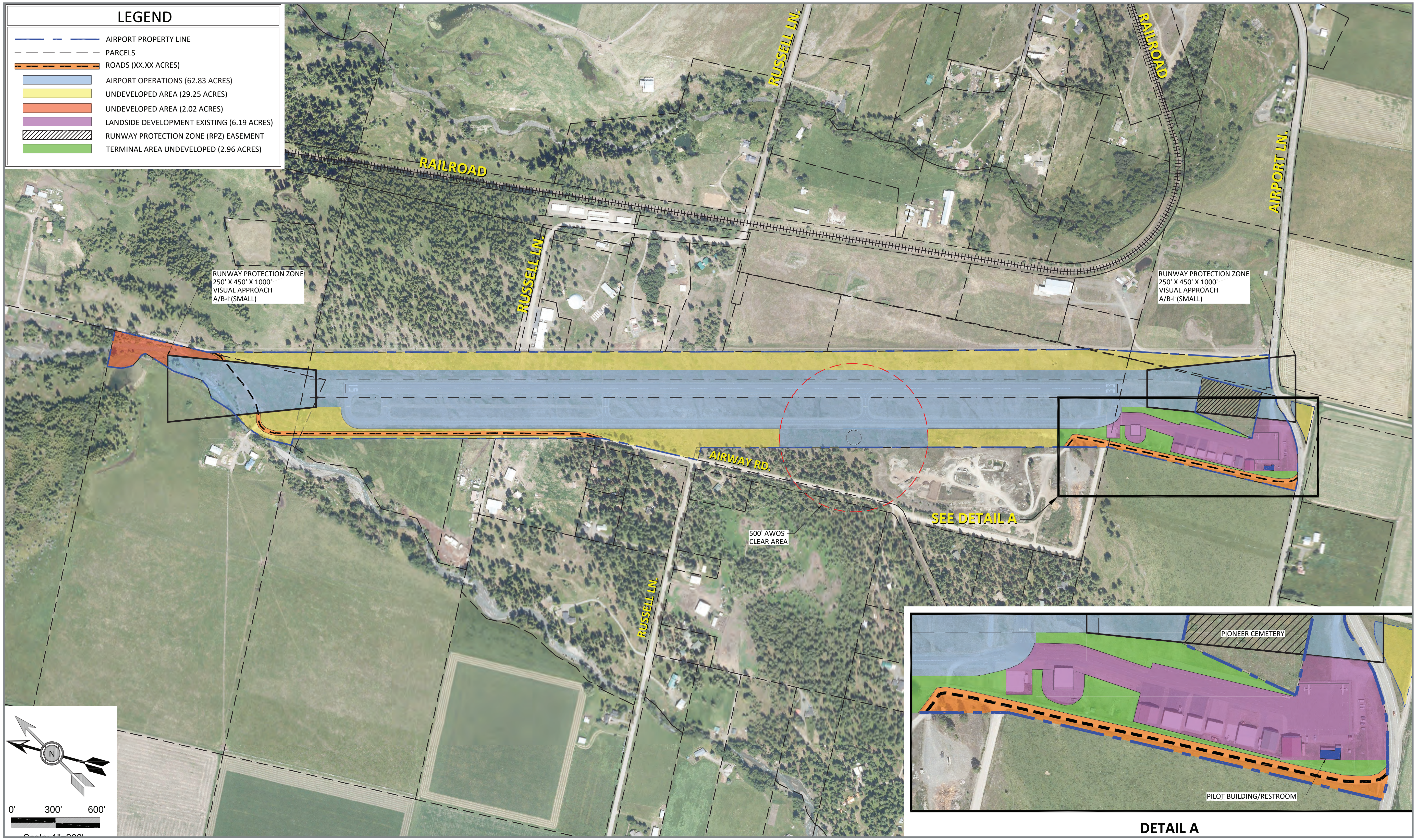
PERIMETER FENCING/GATES

The Airport perimeter is fenced with 6-foot range wire fencing or chain link fencing. The majority of the fencing is located on the airport property line, although some sections extend within the airport site. The existing fencing coverage appears to be adequate for current needs, although wildlife are able to access the airfield. Options for upgrading existing fencing may be considered if animal incursions are significant.

The Airport current has two vehicle gates. The sliding gate located adjacent to the south apron is manually operated; the gate located near the aircraft fueling apron is electrically powered, although the system does not meet FAA specifications.

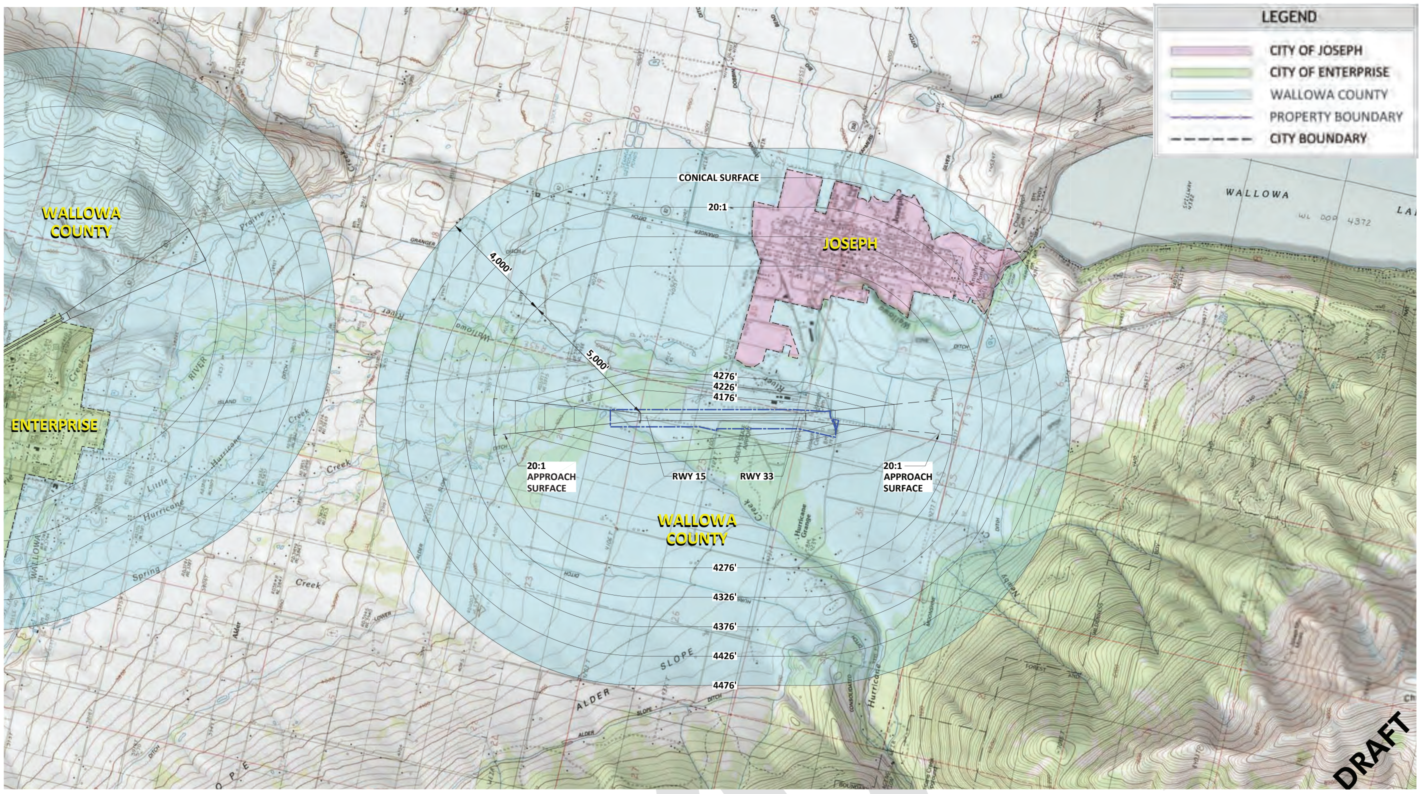
It is recommended that both vehicle gates be upgraded to include automated operation with keypad or card-activated systems. Options for increasing animal resistance through upgraded wildlife fencing may be considered.

FIGURE 4-6: AIRPORT LAND AREA UTILIZATION



JOSEPH STATE AIRPORT

FIGURE 4-7: LAND USE JURISDICTION



ON-AIRPORT LAND USE

On-airport land use needs consist primarily of airfield facilities such as runways, aprons, taxiways/taxilanes, hangars, aircraft storage, and other typical aviation services. **Figure 4-6** illustrates the current airport site configuration, with breakouts provided for existing airside and landside development area and protected areas.

There are several undeveloped areas on the Airport that are not highly developable due to limited access or topography limiting airside access. It is recommended that all existing undeveloped land areas on the Airport are confirmed available or unavailable for aviation land uses during the alternatives process.

The existing M-1 (Industrial) zoning for the parts of the Airport capable of supporting landside development (hangars, aircraft parking, etc.), while not airport-specific, has not prevented any proposed aeronautical land uses from being approved by Wallowa County. Local officials indicate that an update to the existing zoning at Joseph State Airport may be considered in the future to provide a more traditional airport zone that accommodates both primary aeronautical land uses and complimentary support functions such as aviation-related commercial uses, such as aircraft maintenance and related services. This type of change in zoning will not adversely affect the ability of the Airport to accommodate future demand for aviation-related facilities.

OFF-AIRPORT LAND USE

Wallowa County has land use jurisdiction for the Airport and its immediate surroundings; however, some of the Part 77 surfaces for Runway 15/33 extend over the Joseph city limits and urban growth boundary. **Figure 4-7** illustrates local land use jurisdictions in the vicinity of Joseph State Airport.

The review of Wallowa County and City of Joseph Airport Overlay Zoning provided in Chapter 2 did not identify any known off-airport land use compatibility issues. Avigation easements for both runway ends previously acquired by ODA will be reviewed to identify any gaps in coverage/protection, in conjunction with the updates to the Airport Layout Plan and Exhibit A Property Plan drawings.

To continue ensuring airport land use compatibility, it is recommended that ODA work with Wallowa County and the City of Joseph to develop a mitigation plan, as needed, to remove or mitigate any FAR Part 77 surface obstructions identified in the 2020 AGIS survey and referenced on the updated FAR Part 77 Airspace Plan. No changes in runway configuration are anticipated, however if any changes are made to the FAR Part 77 airspace surfaces for Runway 15/33, local ordinances should be updated for consistency.

Summary

Because of the significant investment in airfield facilities at Joseph State Airport made by ODA and FAA over the last twenty years, the projected facility needs for the current twenty-year planning period at are comparatively minor. With only minor expectations, all major airfield components meet or exceed FAA design standards for small aircraft included in ADG I and TDG1.

Recommended improvements include developing instrument capabilities for the runway, accommodating demand for new hangars, providing for different aircraft parking needs, maintaining existing airfield pavements, and satisfying FAA design standards. Facility improvements for fire related aircraft operations at the Airport will be also evaluated as an alternative to the current use of Taxiway A for aircraft parking during emergency fire operations.

The updated forecasts of aviation activity anticipate modest growth in activity; resulting in similarly moderate airside and landside facility demands beyond existing capabilities. The existing airfield facilities can accommodate the forecasted increase in activity, with targeted facility improvements. For the most part, the need for new or expanded facilities, such as aircraft hangars, will be market driven. The non-conforming items noted within this chapter can be addressed systematically during the current planning period to improve overall safety for all users.

Preliminary airport development alternatives will be presented in Chapter 5 to evaluate different options capable of meeting forecast demand, in addition to identifying any development constraints that exist. The process of Planning Advisory Committee (PAC) review of the preliminary alternatives will allow ODA to define and refine the preferred alternative for the master plan and develop a viable implementation strategy.