ROSEBURG REGIONAL
AIRPORT MASTER PLAN

Mead & Hunt

In association with:
ESA
GeoTerra
Land Mark Surveying
Land and Water Environmental Services

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INVENTORY AND ENVIRONMENTAL OVERVIEW

CH. 1

ROSEBURG REGIONAL AIRPORT
CHAPTER 1: INVENTORY AND ENVIRONMENTAL OVERVIEW

CHAPTER OVERVIEW

The Inventory Chapter documents the 2017 conditions at the Roseburg Regional Airport (RBG or the Airport). This chapter evaluates the facilities and services at the Airport to establish a foundation for the recommendations made throughout the Airport Master Plan (Plan). Mead & Hunt collected the project information in several ways, including an airport site visit in September 2017, a review of Airport records provided by the City of Roseburg (the City), and by interviewing Airport users. The Airport inventory is presented in the following sections:

- Airport Overview
- Airside Facilities
- Landside Facilities and Support Services
- Climate – Wind and Weather Conditions
- Financial Overview
- Environmental Overview
- Inventory Summary

1.1 AIRPORT OVERVIEW

This section provides an overview of the Airport's location, history, and operational characteristics. **Table 1-1** below describes the primary attributes of the Airport.

TABLE 1-1: AIRPORT OVERVIEW

Airport Attributes	Description
Owner	City of Roseburg
National Plan of Integrated Airport Systems (NPIAS) Airport Category	Regional
Oregon Department of Aviation Classification	Category III – Regional General Airport
Airport Reference Code (ARC)	B-II
Acreage	187Acres (Approximate)
Airport Reference Point Coordinate	N 43° 14' 21.6102", W 123° 21' 21.0569"
Elevation	533.5 feet Above Mean Sea Level (AMSL)

Source: FAA Publications and Airport Records Obtained October, 2017

1.1.1 LOCATION

The Airport is in Roseburg, Oregon, in Douglas County, shown in **Figure 1-1,** and is owned by the City of Roseburg. The Airport is bounded on the west by Interstate 5 (I-5); on the east, by railroad tracks; on the north, by NW Edenbower Boulevard; and on the south, by NW Stewart Parkway.

The approximate elevation of Roseburg is 500 feet, 33 feet lower than the approximate Airport elevation. Roseburg, Oregon, is in southern Oregon in the Umpqua River Valley. The Airport is in one of the many low points in the Umpqua Valley, which is situated between the Oregon Coastal and Cascade Mountains. Although the Airport is in a relatively flat area, the terrain within 10 miles surrounding the airport is generally 700 to 1,000 feet higher than the elevation of the Airport itself.

RBG is the only airport within 40 miles of Roseburg that has instrument approach procedures that allow for aircraft landings during reduced visibility conditions. The nearest commercial service airports to RBG are the Eugene Airport, approximately 65 miles to the north, and the Rogue Valley International – Medford Airport, approximately 90 miles to the south. RBG is the primary general aviation airport serving Douglas County. Douglas County has three other general aviation airports: Myrtle Creek Municipal Airport (and Heliport), George Felt Airport, and Toketee State Airport. RBG serves business jet aircraft, single- and multi-engine piston aircraft, and helicopters.

1.1.2 PROPERTY

Airport property includes approximately 196 acres surrounding the single 5,003-foot runway. The Airport provides fueling, tie-downs, hangars, and aircraft maintenance facilities, all located west of the runway. The Airport's primary access road is Aviation Drive located west of the Airport.

1.1.3 HISTORY

Originally known as the Roseburg Aviation Park, the first land acquisition of the Airport occurred in 1928. Funding for the initial land purchase for the Airport was completed through a bond initiative led by the Umpqua Post of the American Legion. Part of the original property was sold to the State of Oregon to construct I-5, a 308-mile-long highway that runs between the California and the Washington State lines. Fixed Based Operator (FBO) services began at the Airport as early as 1945, and were originally located on the east side of the runway. In 1959, the FBO relocated to the west side of the runway.

Figure 1-1
Roseburg Location Map

According to the 1977 Master Plan, the Airport had commercial passenger service from 1951 through 1969, peaking at 5,100 annual boardings in 1953, and gradually decreasing to a low of 344 in 1965. In 1992, the City Council adopted an ordinance officially renaming to the Airport the Roseburg Regional Airport to recognize its regional significance and to encourage regional investment in the Airport. In 1998, City Council adopted an ordinance renaming the airfield the Major General Marion E. Carl Memorial Field, after United States Marine Corps Major General Marion Carl. Major General Carl was the first Marine Corps' ace, a military aviator credited with shooting down several aircraft during aerial combat in World War II. A memorial in his honor stands at the southwest end of the Airport.

1.2 AIRSIDE FACILITIES

The airfield facilities include a runway and taxiway system, a navigational aid (NAVAID) system, and other support facilities. **Figure 1-2** illustrates airfield layout, runway configuration, property uses, and other key airport facilities.

1.2.1 AIRFIELD DESIGN STANDARDS

Runway Classification and Design

Design of airport facilities is based on FAA design standards defined in Advisory Circular (AC) 5300-13A, *Airport Design* (AC 5300-13A). To accept FAA grant money, the Airport is required to maintain airfield facilities in line with FAA design standards. Design and setbacks of runways and taxiways are dictated by the Runway Design Code (RDC). The RDC is determined by a combination of an airport's design aircraft approach category (AAC), aircraft design group (ADG), and runway visibility minimums expressed by Runway Visual Range (RVR). Factors that set the Airport Reference Code (ARC) are the most demanding aircraft (also referred to as the design aircraft) the AAC, ADG, and RVR.

The FAA defines the design aircraft as the most demanding type or group of aircraft to conduct at least 500 takeoffs and landings in a year. The most demanding aircraft group that operates at the Airport, as denoted on the current Airport Layout Plan (ALP), is B-II aircraft. The critical aircraft on the current ALP is the Cessna Citation II. The Airport's current ARC is B-II. **Table 1-2** depicts the FAA runway design standards, with the Airport's design standards indicated in bold.

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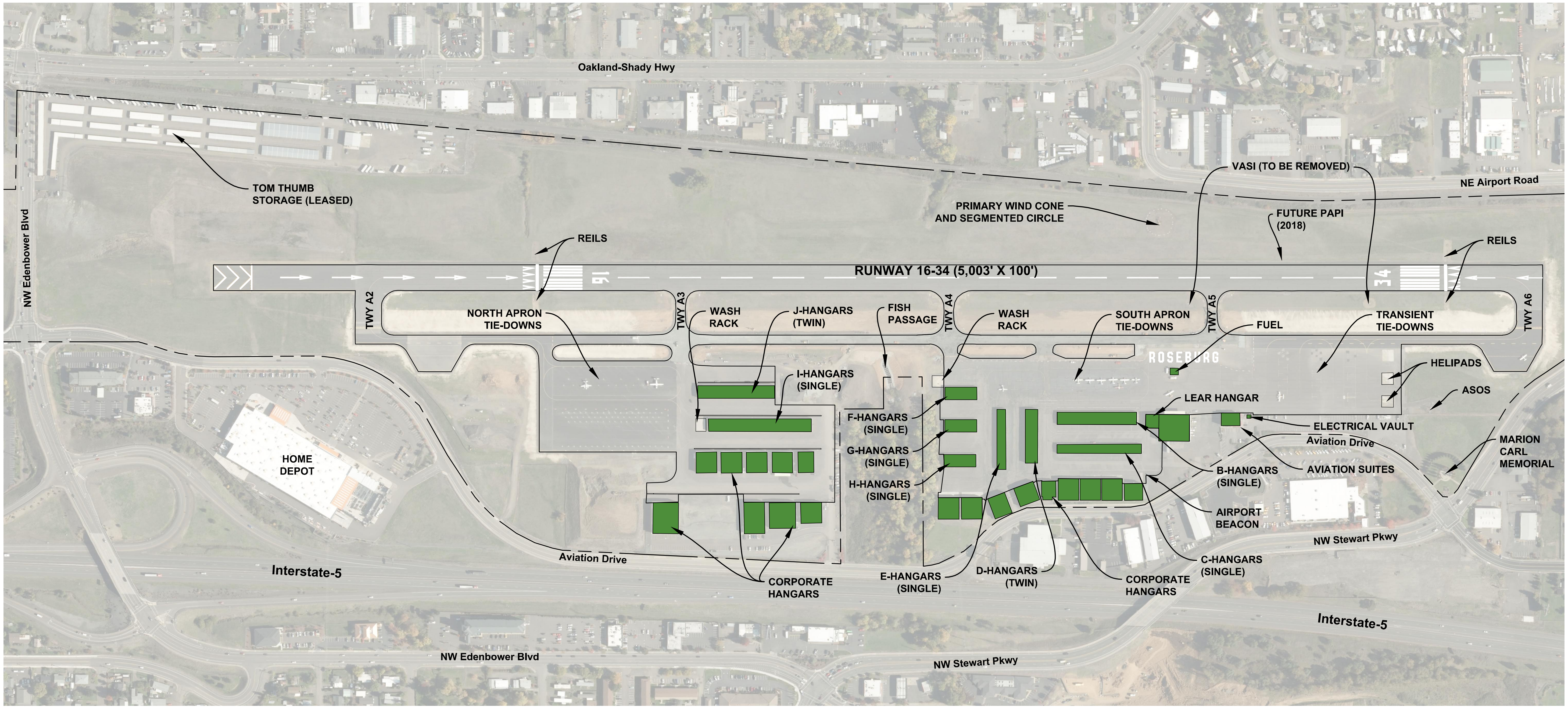

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Figure 1-2

Existing Airport Facilities

Roseburg Regional Airport Master Plan

TABLE 1-2: RUNWAY REFERENCE CODES

Aircraft Approach Category (AAC)		
AAC	Approach Speed	
A	Approach speed less than 91 knots	
B	**Approach speed 91 knots or more but less than 121 knots**	
C	Approach speed 121 knots or more but less than 141 knots	
D	Approach speed 141 knots or more but less than 166 knots	
E	Approach speed 166 knots or more	
Aircraft Design Group (ADG)		
Group Number	Tail Height (in feet)	Wing Span (in feet)
I	< 20’	< 49’
II	**20’ - < 30’**	**49’ - < 79’**
III	30’ - < 45’	79’ - < 118’
IV	45’ - < 60’	118’ - < 171’
V	60’ - < 66’	171’ - < 214’
VI	66’ - < 80’	214’ - < 262’
Visibility Minimums		
RVR (in feet)	Instrument Flight Visibility Category (in statue mile)	
5,000’	**Not Lower than 1 mile**	
4,000’	Lower than 1 mile but no lower than 3/4 mile	
2,400’	Lower than 3/4 mile but not lower than 1/2 mile	
1,600’	Lower than 1/2 mile but not lower than 1/4 mile	
1,200’	Lower than 1/4 mile	

Source: FAA AC 150/5300-13A – Change 1, *Airport Design*, February 2014

Taxiway Design and Standards

The Taxiway Design Group (TDG) determines the taxiway design standards on the airfield. The TDG of an airport is based on the outer to outer Main Gear Width and Cockpit to Main Gear distance of the critical aircraft. As denoted on the current ALP, the Cessna Citation II is the critical aircraft. The Cessna Citation II is classified as TDG-2 aircraft. The ADG of an airport determines the taxiway protection areas. **Table 1-3** depicts the taxiway design standards for RBG.

TABLE 1-3: **TAXIWAY DESIGN STANDARDS**

Taxiway Protection Areas (ADG II)	
Taxiway Safety Area	79 feet[1]
Taxiway Object Free Area	131 feet[1]
Taxilane Object Free Area	115 feet[1]
Wingtip Clearance (ADG II)	
Taxiway Centerline to Parallel Taxiway/Taxilane Centerline	105 feet
Taxiway Centerline to Fixed or Moveable Object	65.5 feet
Taxilane Centerline to Parallel Taxilane Centerline	97 feet
Taxiway Centerline to Fixed or Moveable Object	57.5 feet
Wingtip Clearance (ADG II)	
Taxiway Wingtip Clearance	26 feet
Taxilane Wingtip Clearance	15 feet
Taxiway Design Standards (TDG 2)	
Taxiway Width	35 feet
Taxiway Edge Safety Margin	7.5 feet
Taxiway Shoulder Width	15 feet

1: Parallel to and symmetrical about the Taxiway or Taxilane centerline.

Source: FAA AC 150/5300-13A – Change 1, *Airport Design*, February 2014

1.2.2 RUNWAY SYSTEM

The airfield comprises a single runway aligned in a north-south orientation. Runway 16/34 is 5,003 feet by 100 feet. Runway 16/34 has a single parallel taxiway on the west side that is not full length. The separation from the runway centerline to parallel taxiway centerline is 240 feet, which meets B-II design standards. Runway 16/34 is a non-precision instrument runway with medium-intensity runway lights (MIRL). **Table 1-4** summarizes the data for Runway 16/34.

Precision Instrument Runway
A runway with at least one end having a precision approach procedure that provides course and vertical path guidance conforming to Instrument Landing System (ILS) or Microwave Landing System (MLS) precision approach standards.

Non-Precision Instrument Runway
A runway (other than a precision runway) with at least one end having a non-precision approach procedure that provides course guidance with or without vertical path guidance.

Visual Runway
A runway without an existing or planned instrument approach procedure.

Displaced Thresholds and Declared Distances

The beginning of a runway is known as the threshold. Ideally the thresholds are located at the absolute ends of the runway. In cases when there are airspace obstructions beyond an airport's power to remove, relocate, or lower, the threshold can be located farther down the runway. A relocated threshold from the absolute end of a runway is known as a displaced threshold. Due to terrain airspace obstructions, both ends of Runway 16/34 are displaced.

When the end of a runway is displaced, it affects the usable distances of the runway, known as declared distances, available for an aircraft's Takeoff Run Available (TORA), Takeoff Distance Available (TODA), Accelerate-Stop Distance (ASDA), and Landing Distance Available (LDA). **Figure 1-3** illustrates the declared distances for Runway 16/34. **Table 1-4** summarizes the displaced thresholds and declared distances for Runway 16/34.

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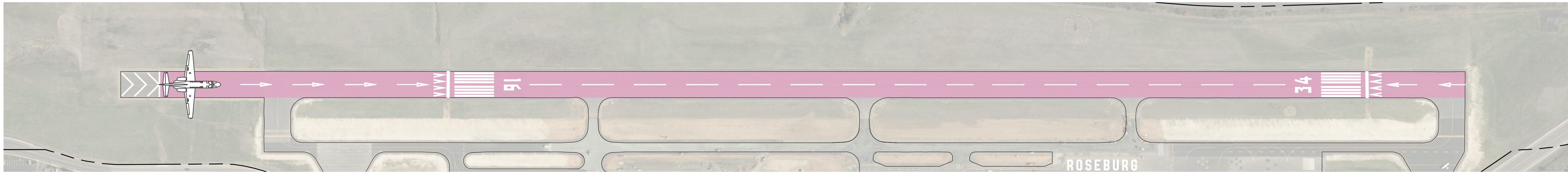
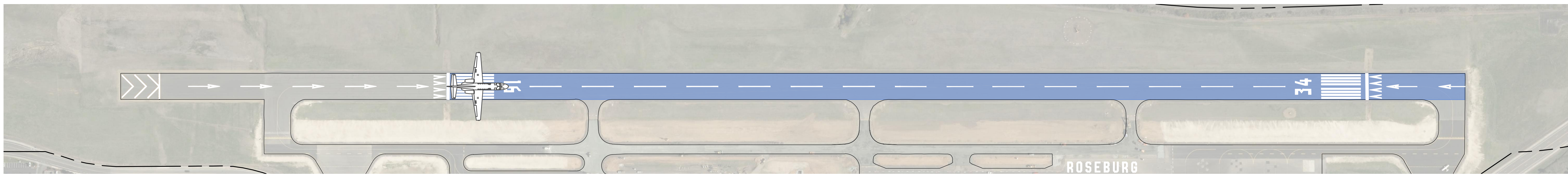
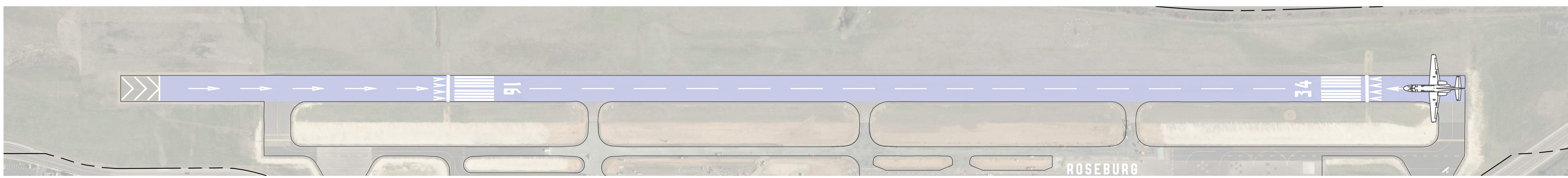


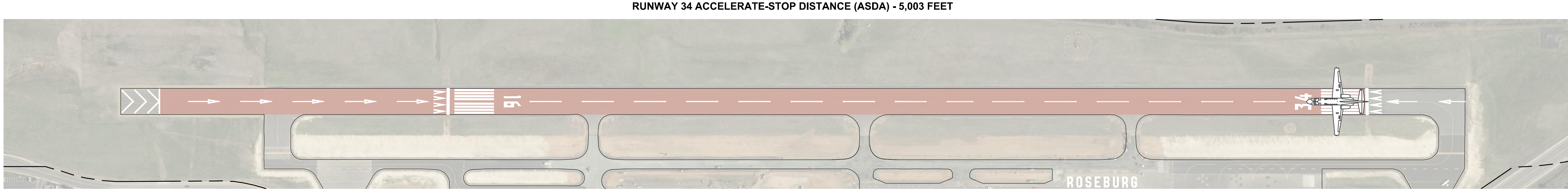
RUNWAY 16 TAKEOFF RUN AVAILABLE (TORA) - 5,003 FEET
RUNWAY 16 TAKEOFF DISTANCE AVAILABLE (TODA) - 5,003 FEET
RUNWAY 16 ACCELERATE-STOP DISTANCE (ASDA) - 5,003 FEET



RUNWAY 16 LANDING DISTANCE AVAILABLE (LDA) - 3,902 FEET



RUNWAY 34 TAKEOFF RUN AVAILABLE (TORA) - 5,003 FEET
RUNWAY 34 TAKEOFF DISTANCE AVAILABLE (TODA) - 5,003 FEET
RUNWAY 34 ACCELERATE-STOP DISTANCE (ASDA) - 5,003 FEET



RUNWAY 34 LANDING DISTANCE AVAILABLE (LDA) - 4,631 FEET

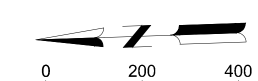


Figure 1-3

Declared Distances

NOTE: AIRCRAFT SHOWN ARE NOT TO SCALE AND ARE INTENDED FOR GRAPHICAL PURPOSES ONLY

TABLE 1-4: RUNWAY 16/34 ATTRIBUTES

<table>
<tr><th>Runway Attributes</th><th colspan="3">Description</th></tr>
<tr><td>Dimensions</td><td colspan="3">Length: 5,003 feet, Width: 100 feet
Runway 16 Displaced Threshold: 1,100 feet
Runway 34 Displaced Threshold: 372 feet</td></tr>
<tr><td rowspan="5">Declared Distances</td><td>Declared Distance Types</td><td>Runway 16</td><td>Runway 34</td></tr>
<tr><td>Takeoff Run Available (TORA)</td><td>5,003 feet</td><td>5,003 feet</td></tr>
<tr><td>Takeoff Distance Available (TODA)</td><td>5,003 feet</td><td>5,003 feet</td></tr>
<tr><td>Accelerate-Stop Distance (ASDA)</td><td>5,003 feet</td><td>5,003 feet</td></tr>
<tr><td>Landing Distance Available (LDA)</td><td>3,902 feet</td><td>4,631 feet</td></tr>
<tr><td>Bearing</td><td colspan="3">180°/360° (True)</td></tr>
<tr><td>Effective Grade</td><td colspan="3">0.06%</td></tr>
<tr><td>Weight Bearing Capacity</td><td colspan="3">Single-Wheel: 42,000 lbs.
Double-Wheel: 54,000 lbs.
Double Tandem: 88,000 lbs.</td></tr>
<tr><td>Surface</td><td colspan="3">Asphalt, Good Condition</td></tr>
<tr><td>Markings</td><td colspan="3">Non-Precision, Fair Condition</td></tr>
<tr><td>Lighting</td><td colspan="3">Medium-Intensity Runway Edge Lights
Runway End Identifier Lights (REIL) – Runway End 16
Runway End Identifier Lights (REIL) – Runway End 34
Visual Approach Slope Indicator (VASI) – 2-Box Runway End 34 (To be removed 2018)
Precision Approach Path Indicator (PAPI) – 4-Box Runway End 34 (To be installed 2018)</td></tr>
<tr><td>Signage</td><td colspan="3">Distance To Go Signs</td></tr>
</table>

Source: FAA Airport Records Obtained October, 2017

1.2.3 TAXIWAY SYSTEM

The Airport taxiway system, illustrated in **Figure 1-4**, consists of five asphalt taxiways, a partial-length parallel Taxiway A, and five connectors (A2, A3, A4, A5, A6) that provide access between the runway and aircraft parking and storage facilities. Taxiway A does not extend to the final 400 feet of runway on the Runway 16 end. In 2012, Runway 16/34 was extended 400 feet based on the runway extension project highlighted on the current signed ALP. The runway extension was constructed using Connect Oregon funding. The FAA did not support the extension project. Because of this, when Taxiway A was relocated in 2013, the FAA did not fund the final 400 feet of Taxiway A.

Due to the lack of a full-length parallel Taxiway-A, aircraft that land the full length of Runway 16/34 towards the Runway 16 end are required to back-taxi. Back-taxing is a ground procedure that uses the runway as a taxiway in the opposite direction an aircraft has landed or is preparing to takeoff. While back-taxi accidents are rare, this ground maneuver increases runway occupancy time and decreases airport capacity.

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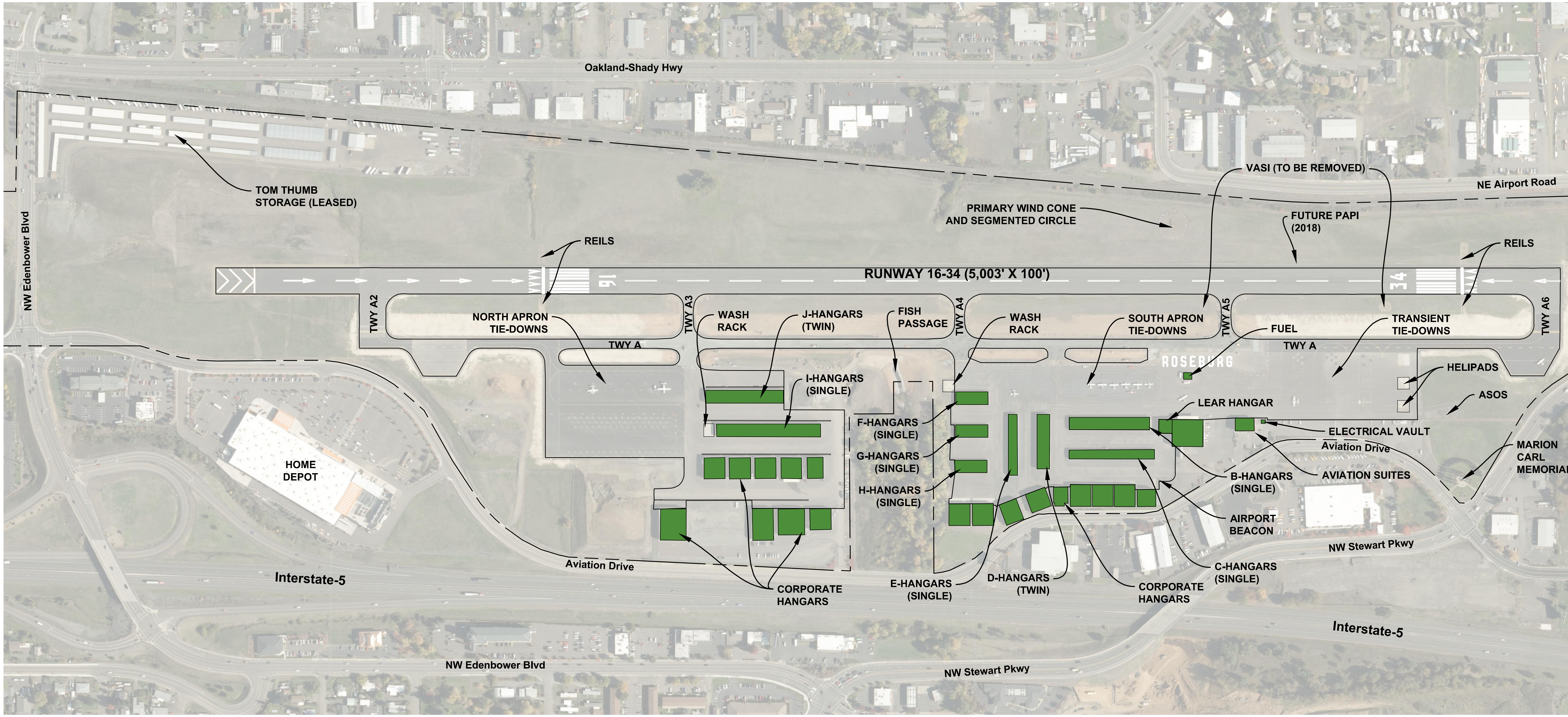

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Figure 1-4
Existing Airport Facilities

Roseburg Regional Airport Master Plan

Runway Safety Areas

In the early development of aviation and airports, aircraft operated from unimproved airfields without designated runways. As aviation and airfields continued to develop, takeoff and landing paths began to be centered on defined areas known as landing strips. As more advanced aircraft were developed, they required paved landing strips and with a surrounding area capable of supporting aircraft without causing structural damage to the aircraft. Design surfaces such as the Runway Safety Area (RSA), Object Free Area (OFA), and Runway Protection Zone (RPZ) were developed to enhance the safety of aircraft that undershoot, overrun, or veer off the runway and the safety of people and property on the ground. The Airport's RSAs and protection zones are designed to B-II standards listed in **Table 1-5**. These areas are depicted in **Figure 1-5**.

Runway Safety Area (RSA)

A defined surface surrounding the runway prepared or suitable for reducing the risk of damage to aircraft in the event of an undershoot, overrun, or excursion from the runway.

Runway Object Free Area (ROFA)

An area centered on the ground on the runway centerline provided to enhance the safety of aircraft operations by remaining clear of objects, except for objects that need to be in the ROFA for air navigation or aircraft ground maneuvering purposes.

Obstacle Free Zone (OFZ)

The three-dimensional airspace along the runway and extended runway centerline that is required to be cleared of obstacles for aircraft operations.

Runway Protection Zones (RPZ)

RPZs are areas beyond runway ends shaped like a trapezoid and intended to enhance the protection of people and property on the ground. The FAA has issued a memo titled *Interim Guidance on Land Uses Within a Runway Protection Zone* to clarify the policy on compatible land uses within the RPZ. The FAA recommends that airports own or have controlling easements over the property within the RPZ. Due to Runway 16/34's displaced thresholds, the approach and departure RPZs do not begin at the same point for each runway end. NW Edenbower Boulevard goes through the Runway 16 end departure RPZ and NW Stewart Parkway goes through both the approach and departure RPZs on the Runway 34 end. Additionally, homes and businesses lie within the Runway 34 end RPZ. Because these roads and buildings are existing features, the current FAA RPZ guidance does not require the roads or buildings to be moved. Options to remove or mitigate the incompatible land uses in the RPZs are evaluated in **Chapter 4, Improvement Alternatives**.

Non-Standard Design Surface Conditions

There is one non-standard design surface condition at RBG. The ROFA beyond the Runway 34 end is limited to 190 feet for a small area at NW Stewart Parkway. The signed 2006 ALP for RBG states under Modification to Standards: "*The Runway Object Free Area (ROFA) at the South End of Runway is 190' vs. the ARC B-II standard of 300'. The ROFA is limited by Stewart Parkway, it is not practical to move Stewart Parkway so an indefinite modification to FAA standards is recommended*." Corrective measures are evaluated in **Chapter 4, Improvement Alternatives**.

TABLE 1-5: RUNWAY DESIGN SURFACES

Runway Design Surface	Dimensions for B-II Runways (in feet)
Runway Safety Area (RSA)	300' beyond runway end, 150' wide[1]
Runway Object Free Area (ROFA)	300' beyond runway end, 500' wide[1]
Runway Obstacle Free Zone (OFZ)	200' beyond runway end, 400' wide[1]
Runway Protection Zone (Approach and Departure)	200' beyond runway end, 500' inner width, 700' outer width, 1,000' length

1: Parallel to and symmetrical about the Runway centerline.

Source: FAA AC 150/5300-13A – Change 1, *Airport Design*, February 2014

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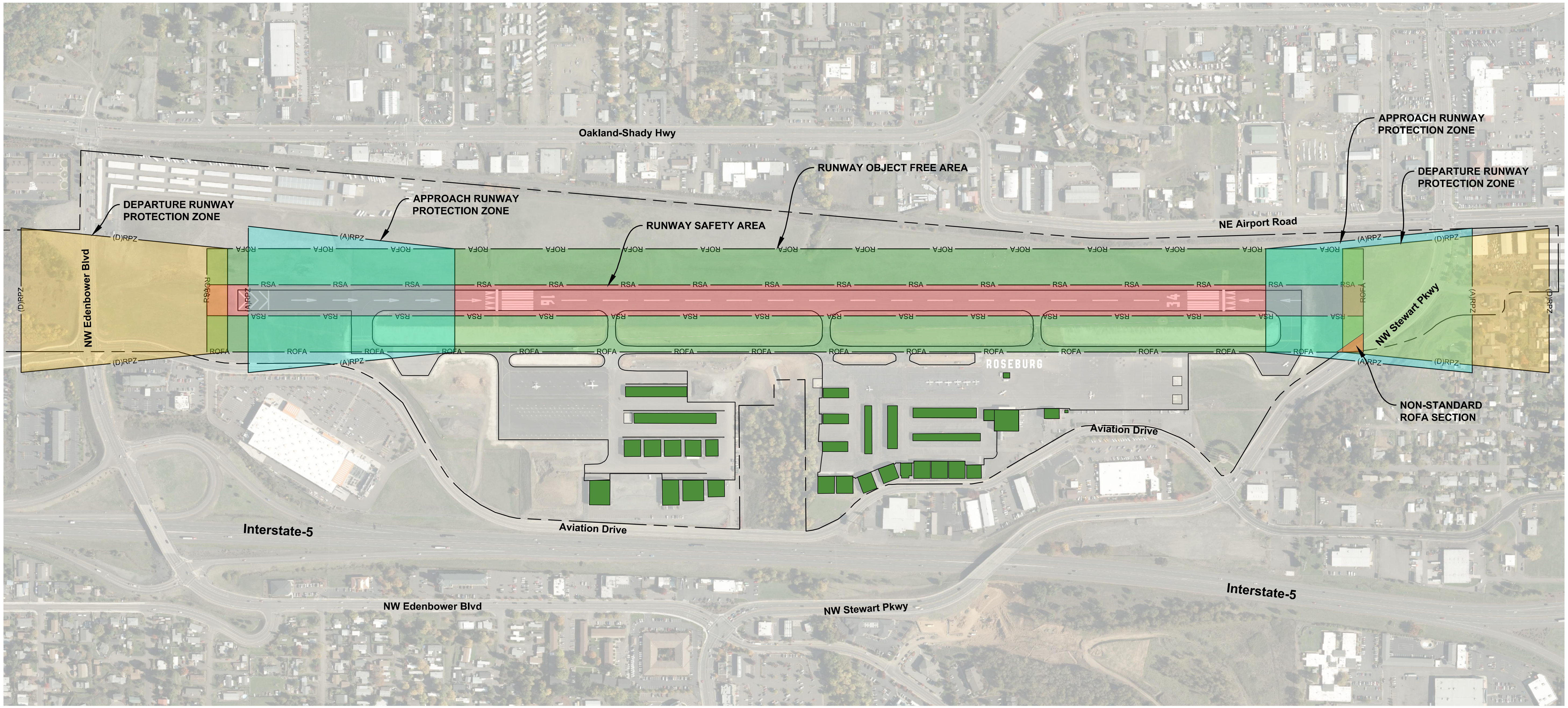

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Figure 1-5

Design Surfaces

1.2.4 AIRFIELD PAVEMENT CONDITIONS

The FAA requires any airport sponsor requesting and receiving federal funds for pavement improvements to implement a pavement maintenance management program. The Oregon Department of Aviation (ODA) manages the Pavement Evaluation/Maintenance Management Program for the state's eligible airports. ODA performs pavement inspections and publishes pavement condition reports of the state's airports once every three years. These reports allow airports to assess their overall pavement condition, prepare and forecast budgets to maintain pavement at an acceptable condition, and identify required maintenance and rehabilitation activities.

ODA evaluates pavement conditions using the Pavement Condition Index (PCI) methodology developed by the U.S. Army Corps of Engineers. The PCI quantifies the types, amount, and severity of distress observed in pavements. The Pavement Condition Rating (PCR) is associated with ranges of PCI values to verbally describe the condition. The PCI rating quantifies the condition using a scale from 0 (PCR - Failed) to 100 (PCR - Good), with ratings applied to individual areas of pavement. The most recent report for RBG is based on the 2016 inspection, and the results are shown in **Figure 1-6** and summarized in **Table 1-6**. **Table 1-7** describe the association between PCI and PCR values.

TABLE 1-6: AIRFIELD PAVEMENT CONDITIONS

Pavement Area	2013 Inspection (PCI Rating) [1]	2016 Inspection (PCI Rating) [1]	2021 Forecast (PCI Rating) [1]	2026 Forecast (PCI Rating) [1]
Runway 16/34	83.25	**85.75**	82.5	79.75
Taxiway A	87	**99.8**	89.6	79.8
Taxiway A2	74	**79**	78	77
Taxiway A3	100	**91**	85.5	79.5
Taxiway A4	88.5	**86**	82	75.5
Taxiway A5	87	**86.5**	82.5	76
Taxiway A6	84.5	**89.5**	85.5	79.5
North Apron	97	**96.12**	86.75	77.37
South Apron	81.5	**91**	80.62	72.25

1: Average PCI of pavement sections combined for each area.

Source: ODA Pavement Evaluation/Maintenance Management Program 2016

TABLE 1-7: PCI/PCR ASSOCIATION

PCI	PCR
100-85	Good
85-70	Satisfactory
70-55	Fair
55-40	Poor
40-25	Very Poor
25-10	Serious
10-0	Failed

Source: ODA Pavement Evaluation/Maintenance Management Program 2016

The pavements at the Airport are primarily bituminous asphalt. Only the helicopter pads and aircraft wash racks are concrete. The PCI of the pavements at the Airport, except for the small, 1,900-square-foot Section A01RS-09 on the South Apron, range from a low of 72 (PCR - Satisfactory) to a high of 100 (PCR - Good). The weighted average PCI for all the Airport pavements is 90 (PCR - Good). Overall, the pavement at RBG is in good condition. The primary pavement distresses observed during the 2016 inspection were longitudinal and transverse cracking, weathering, block cracking, patching, raveling, and joint and corner spalls.

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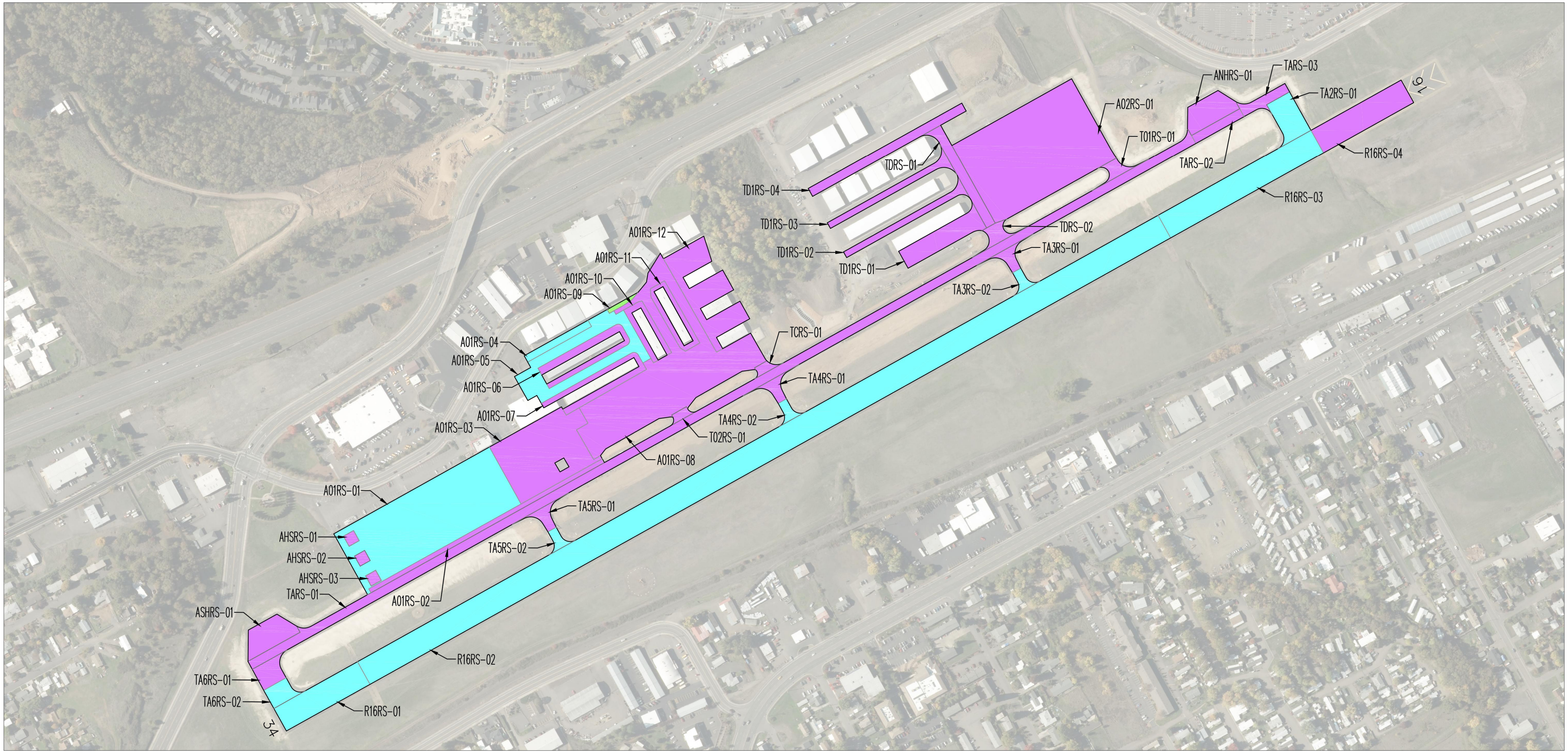


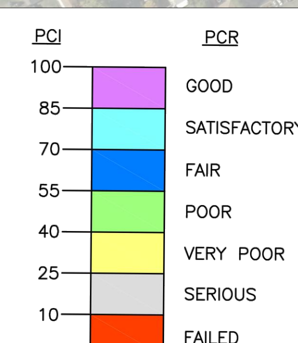


Figure 1-6
Airfield Pavement Conditions (2016)

1.2.5 INSTRUMENT PROCEDURES AND NAVIGATIONAL AIDS

Aircraft arriving or departing from the Airport rely on instrument procedures, instrument and visual approach aids, weather observation, and communication for safe operations. This section describes these items in more detail.

Instrument Procedures

Table 1-8 below identifies the Airport's Non-Precision Instrument Approach Procedures (IAPs) by type, allowable aircraft approach category, and lowest approach minimums. Due to terrain impacts, there are no IAPs available for the Runway 16 approach. Similarly, terrain impacts associated with the Runway 34 approach result in higher than standard minimums.

TABLE 1-8: INSTRUMENT APPROACH PROCEDURES

Runway End	Procedure	Category	Aircraft Approach Category (AAC)	Minimum Descent Altitude (Feet AGL)	Visibility Minimums (Statute Mile)
34	RNAV (GPS)-B	Circling	A	1,166'	1 1/4
		Circling	B	1,166'	1 1/2
		Circling	C	1,166'	3
		Circling	D	1,386'	3
34	VOR-A	Circling	A	2,075'	1 1/4
		Circling	B	2,075'	1 1/2
		Circling	C, D	2,600'	3
34	VOR/DME-A	Circling	A	1,215'	1 1/4
		Circling	B	1,215'	1 1/2
		Circling	C	1,215'	3
		Circling	D	1,395'	3

RNAV (GPS): Area Navigation (Required Navigation Performance)
AGL: Above Ground Level
VOR/DME: VHF Omni-Directional Range/Distance Measuring Equipment
Circling: A maneuver to align an aircraft with a runway for landing when a straight-in landing is not possible.

Source: FAA Terminal Procedures Publication, Obtained October 2017.

Navigational Aids

Navigational Aids (NAVAIDs) are visual or electronic guides that assist aircraft operations during all flight conditions. Visual NAVAIDs are guides such as lights and wind indicators that a pilot can see through the aircraft window. Electronic NAVAIDs are guides that are picked up by onboard aircraft instruments during poor visibility conditions to help guide pilots.

Both Runway 16 and Runway 34 are equipped with Runway End Identifier Lights (REILs), consisting of high-intensity, sequenced strobe lights that mark the approach end of a runway to visually aid pilots landing during periods of reduced visibility or darkness. RBG is equipped with an on airport non-directional rotating light beacon, automated surface observing system, and a primary wind cone with a segmented circle. The Airport has an off-airport Very-High Frequency Omni Directional Range (VOR) owned by the FAA. The VOR guides a non-precision approach into Runway 34. Runway 34 has a 2-box Visual Approach Slope Indicator (VASI); however, due to penetrations to the VASI Obstacle Clearance Surface (OCS), it is currently out-of-service and unavailable for aircraft use.

Nighttime Instrument Approach Procedures

On November 17, 2015, the FAA Office of Air Traffic Organization (ATO) issued notice to the Airport identifying obstacles penetrating the IAP 20:1 Visual Surface for Runway 34. The notice is included in **Appendix D, FAA Correspondence**. The identified obstacles included ground penetrations from Mt. Nebo south of the Airport and numerous tree penetrations. The penetrations to the 20:1 Visual Surface resulted in the loss of IAPs for Runway 34 during night operations. This means the IAPs outlined in **Table 1-8** are only available to aircraft during day operations. Aircraft wishing to land at RBG during the nighttime can only do so under visual conditions.

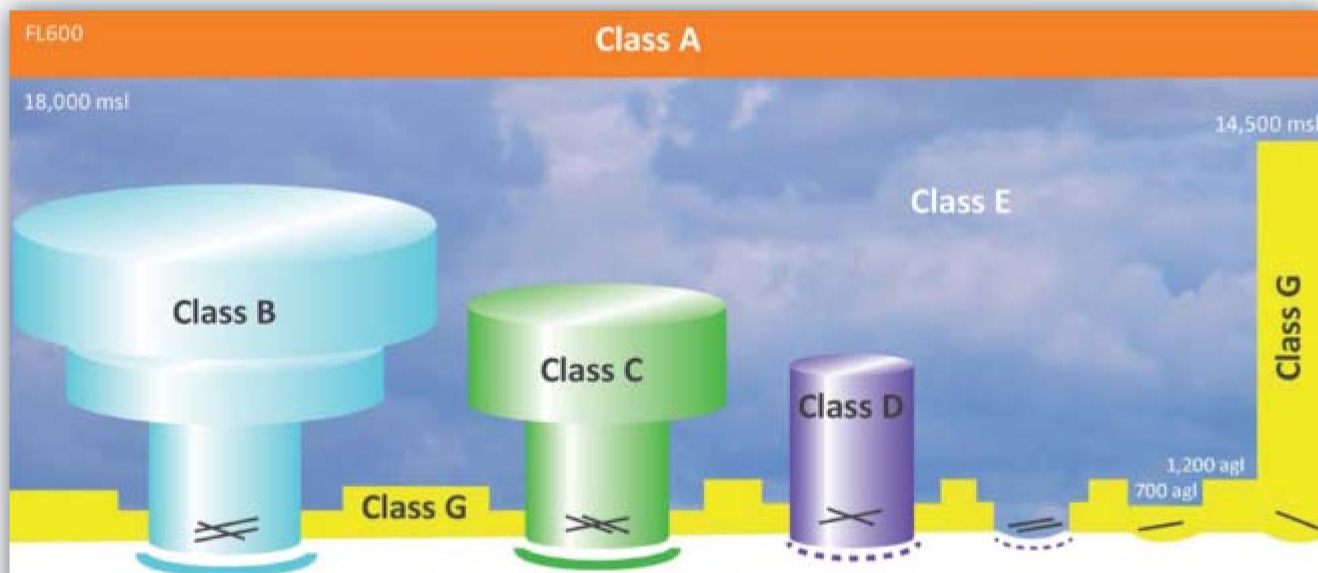
The November 17 correspondence states: "In situations where the options to remove, lower, or light above are not possible, with FAA approval, a commissioned Visual Glideslope Indicator (VGSI) may (with Flight Standards approval) be used to mitigate the hazard associated with the unlit obstacles. Examples of a VGSI include Precision Approach Path Indicator (PAPI) or Visual Approach Slope Indicator (VASI)."

On July 12, 2016, FAA Flight Inspection Services conducted a flight check attempting to commission the Runway 34 VASI. The flight check revealed penetrations to the VASI OCS. The City has determined that exploring further means to commission the existing VASI would be cost prohibitive compared to installing a new VGSI.

The Airport is currently installing a new PAPI to reestablish the nighttime Instrument Approach Procedures. Construction and the commissioning of the new PAPI is expected to occur in the Spring of 2018. During a teleconference held on August 25, 2017, between the City and the FAA, the FAA expressed the need for the PAPI to be set to a four-degree glide path (versus the standard three-degree glide path) because of penetrations to the PAPI OCS. Additionally, the FAA expressed the nighttime IAPs may only be reestablished for approach category A and B aircraft, not C and D. Solutions to reestablish the nighttime IAPs for C and D aircraft will be addressed in **Chapter 4, Improvement Alternatives** in conjunction with needs identified in **Chapter 2, Aviation Activity Forecasts**.

Airspace

Figure 1-7 depicts the five different types of airspace classified by the FAA. RBG is in Class E airspace, bordered by uncontrolled Class G airspace. A large amount of the airspace over the United States is designated Class E. Class E airspace is configured to contain instrument flight procedures at non-towered airports. Air traffic control services within vicinity of the Airport are provided by the Seattle Air Route Traffic Control Center, with the McMinnville Flight Service Station providing flight planning and advisory services. **Figure 1-8** depicts the aeronautical chart for the Airport and surrounding airspace structure.



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 fromt he 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 and Above	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

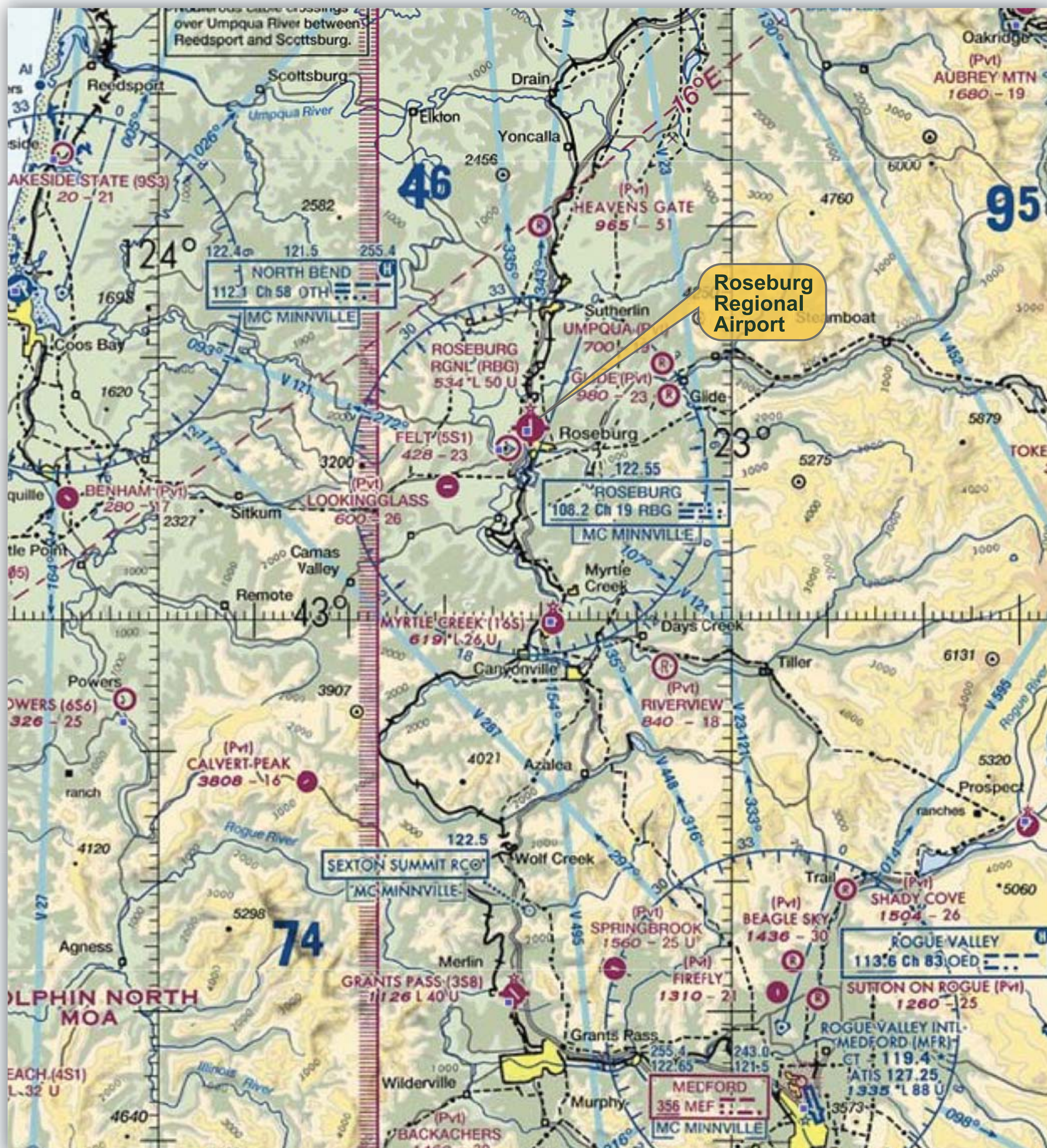
*Prior to operating within Class B, C or D airspace (or Class E airspace with an operating control tower), student, sport, and recreational pilots must meet the applicable FAR Part 61 training and endorsement requirements. Solo student, sport, and recreational pilot operations are prohibited at those airport is 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: *Federal Aviation Administration*

Figure 1-7
Airspace Classification Diagram



N Scale 1" = 13 Miles
Source: *www.vfrmap.com*

Figure 1-8
Airspace Summary

1.2.6 AIRFIELD MARKING AND LIGHTING

Airfield marking and lighting enhance a pilots wayfinding and situational awareness. The standards for airfield marking are defined in FAA AC 150/5340-1L, *Standards for Airport Markings*. Standards for airfield lighting are defined in AC 150/5340-30H, *Design and Installation Details for Airport Visual Aids*.

Runway Landing Designator
Numbers that identify the magnetic heading of runway end.

Runway Threshold Marking
Marking that identifies the actual beginning point of the runway threshold used for landing.

Centerline Marking
Marking that identifies the physical center of the runway or taxiway width.

Aiming Point Marking
Marking that provides a visual aiming point for landing operations.

Runway Markings

Runway markings are white in color. The requirements for runway markings depend on the approach category of the runway. The markings on Runway 16/34, a non-precision runway, include runway landing designators, threshold markings, and centerline markings.

Non-Standard Runway Markings

In AC-150/5340-1L, Table 2-1 *Minimum Required Runway Surface Marking Schemes for Paved Runways*, states that, for non-precision approach runways, an aiming point is required on instrumented runways 4,200 feet in length or longer. Runway 16/34 is 5,003 feet in length and an instrument runway based on the IAPs described in **Table 1-8** above. However, Runway 16/34 currently does not have any runway aiming point markings.

Taxiway Markings

Taxiway markings are yellow except for hold position signs painted in white with red backgrounds. At airports without operating control towers like RBG, holding position markings identify the location where pilots should ensure their aircraft have adequate separation from other aircraft operating on the runway. The markings on the taxiways at the Airport include centerline, taxiway edge marking, runway holding position markings, and surface painted hold signs.

Runway Lighting

Runway 16/34 has MIRL, an out of service two-box VASI that will be replaced by a four-box PAPI in the spring of 2018, REILs on both runway ends, and one lighted primary wind cone. The electrical infrastructure was constructed in the 1970s.

Taxiway Lighting

The parallel Taxiway A was relocated in 2013, at which time new medium intensity LED taxiway edge lighting was installed.

Other Lighting

The Airport has a non-directional beacon located west of the FBO.

1.2.7 OTHER AIRSIDE FACILITIES

Fencing, gates, and service roads are airside facilities briefly discussed in this section.

Fencing and Gates

The Airport has a perimeter chain-link fence with barbed wire surrounding the airfield to prevent unauthorized access. The Airport has a series of gate access points to the FBO, hangars, and other airfield movement areas.

Medium-Intensity Runway Lights (MIRL)

MIRL include white edge lights with amber lights near the runway ends to indicate the runway remaining.

Runway End Identifier Lights (REIL)

Runway End Identifier Lights are a set of two synchronized, unidirectional flashing lights to help identify the runway end during periods of low visibility or when it is less distinct from its surroundings.

Precision Approach Path Indicators (PAPI)

Precision Approach Path Indicators project light along the glide path to a runway end, with red and white colored lights indicating the aircraft's vertical position relative to the defined glide path (above, below, or on glide path).

Visual Approach Slope Indicators (VASI)

Visual Approach Slope indicators perform a similar function to the PAPI. However, due to the age of the technology, the FAA no longer installs VASI systems.

Non-Directional Beacon

A beacon indicates the location of an airport to pilots flying at night or during reduced visibility.

Wind Cone

A wind cone indicates wind direction and speed

Service Roads

The Airport does not have a perimeter road that follows the perimeter fence. Additionally, there is no access road on the airfield connecting the north and south aprons. Several Airport tenants, particularly those on the north side of the Airport, have expressed interest in the addition of an on-airport access road connecting the north and south aprons to avoid having to leave Airport property to access the south apron. The Airport's single FBO is located on the south apron.

1.3 LANDSIDE FACILIITES AND SUPPORT SERVICES

This section will inventory the various aircraft support facilities, services, access, and utilities at RBG.

1.3.1 AIRCRAFT APRONS

Aircraft aprons are areas of an airport where aircraft can park, load or unload, refuel, and be boarded. The Airport has two apron areas, the south apron and the north apron. The aprons serve the landside facilities such as the FBO, aviation hangars, and transient parking for fixed-wing and helicopter aircraft. The Airport has 57 single-engine aircraft tie-downs, 11 multi-engine aircraft tie-downs, and 2 designated helicopter apron parking spaces. **Tables 1-9** and **1-10** describe RBG's aircraft parking areas.

TABLE 1-9: GENERAL AVIATION AIRCRAFT APRONS AND PARKING

Apron Area	Apron Function	Parking Space Type	Parking Spaces
South Apron	FBO Ramp, Helicopter Pads, Based and Transient Parking, Hangar Access, Access to Aircraft Wash Rack, Access to Self-Fueling	Tie-down Single	31
		Tie-down Twin	5
		Helicopter	2
North Apron	Based and Transient Aircraft Parking, Hangar Access, Wash Rack	Tie-down Single	26
		Tie-down Twin	6
		Helicopter	0

TABLE 1-10: TOTAL GENERAL AVIATION AIRCRAFT APRONS PARKING

Parking Space Type	Parking Spaces
Tie-down Single	57
Tie-down Twin	11
Helicopter	2

1.3.2 AIRCRAFT STORAGE

As of 2017, the Airport has 108 based aircraft. The Airport has six T-Hangars and 18 box hangars. Both types are on the north and south aprons. T-Hangars store only one aircraft per unit, while box hangars can store multiple aircraft. A survey of the condition of the hangars on Airport property was conducted in September 2017. In general, the majority of hangars are in fair condition. A complete building inventory discussing the conditions, needs, strengths, and weaknesses of the buildings on Airport property can be found in **Appendix B, Building Inventory**. **Figure 1-9** shows the layout of the airport buildings, and **Table 1-11** summarizes the hangar capacities. The T-Hangars on the airfield are owned by the City of Roseburg. The City of Roseburg owns the land for the box hangars.

TABLE 1-11: AIRPORT HANGAR CAPACITY

Hangar Type	Quantity
Single-Engine Aircraft T-Hangars	59
Multi-Engine Aircraft T-Hangars	12
Corporate Box Hangars	18
Total	**89**

1.3.3 FIXED BASE OPERATORS

Fixed Based Operators (FBOs) support general aviation activity by providing services to aircraft and pilots. The Airport has a single FBO, Western Oregon Aviation, on the south apron. The FBO is a full-service operation that provides the following services:

- Aviation fuel (100 low lead and Jet A)
- Aircraft ground handling
- Oxygen service
- Aircraft parking (ramp or tiedown)
- Hangars
- Passenger terminal and lounge
- Flight training
- Aircraft rental
- Aerial tours/aerial sightseeing
- Aircraft charters
- Pilot Lounge

Mead &Hunt

Building Number (ALP)	Address	Building
1	2131	Aviation Suites
2	-	G T-Hangars (Single)
3	-	H T-Hangars (Single)
4	2251	FBO
4A	2251A	Lear Hangar
5	-	B T-Hangars (Single)
6	-	C T-Hangars (Single)
7	-	D T-Hangars (Twin)
8	-	E T-Hangars (Single)
9	2311	Corporate Hangar
10	2321	Corporate Hangar
11	2331	Corporate Hangar
12	2341	Corporate Hangar
13	2351	Corporate Hangar
14	2361	Corporate Hangar
15	2371	Corporate Hangar
18	-	F T-Hangars
22	-	Electrical Vault
28	-	Aircraft Fuel
31	-	J T-Hangars (Twin)
32	-	I T-Hangars (Single)
33	2777	Corporate Hangar
34	2785	Corporate Hangar
35	2795	Corporate Hangar
36	2805	Corporate Hangar
37	2815	Corporate Hangar
38	2775	Corporate Hangar
39	2787	Corporate Hangar
40	2797	Corporate Hangar
41	2825	Corporate Hangar

0 100 200

Figure 1-9
Building Plan

1.3.4 AIRCRAFT SUPPORT FACILITIES

Fuel Facilities

Table 1-12 summarizes the aircraft fuel storage facilities, dispensing, and volumes at the Airport.

TABLE 1-12: AIRCRAFT FUEL STORAGE

Storage Type	Owner	Facilities
Fuel Storage Tanks	FBO	12,000-gallon Jet-A Above-ground Tank
	FBO	12,000-gallon 100-LL Above-ground Tank
	Roseburg Forest Products	12,000-gallon Jet-A Underground Tank
	D.R. Johnson Lumber Company	12,000-gallon Jet-A Underground Tank
Fuel Dispensing Trucks	FBO	2,000-gallon Jet-A Fuel Truck
	FBO	700-gallon 100-LL Truck
	Reach	500-gallon Jet-A Trailer

Wash Rack

The Airport has two aircraft wash racks. They are located on both the north apron and south apron near the aircraft storage areas.

1.3.5 AERIAL FIREFIGHTING

In the event of forest fires near Roseburg, the Airport is used as Single Engine Air Tanker (SEAT) base by the Douglas Fire Protection Agency (DFPA). In interviews with DFPA, they have stated the loss of IAPs for Runway 34 during the night has affected their operations, because they have aircraft working at night during fire season. When DFPA aircraft are unable to operate at the Airport due to poor visibility at night, aircraft must leave a fire sooner and leave ground crews to fight fires without aerial support.

On the airfield, there is no designated space for the SEAT base. Additionally, there is no permanent water supply or power supply for DFPA's equipment. Currently, a portion of the north apron is temporarily used to house the temporary structures, equipment, and tanks for DFPA. When the North Apron is used as a SEAT base, the tie-down usage is impacted.

1.3.6 AIRPORT ACCESS

The Airport is served by local paved roads of the local road network. Aviation Drive, which is the main road serving the Airport, intersects NW Stewart Parkway at the south end of the Airport and NW Edenbower Boulevard at the north end. NW Edenbower Boulevard connects to I-5 approximately a half-mile west of the Airport.

1.3.7 AIRPORT UTILITIES

Table 1-13 summarizes the major on-Airport utilities

TABLE 1-13: AIRPORT UTILITIES

Utility	Service Provider
Electric Power	Pacific Power
Water	City of Roseburg
Sanitary Sewer	Roseburg Urban Sanitary Association (RUSA)
Gas	Avista
Stormwater	City of Roseburg
Communications	Charter, Century Link, Douglas Fast Net

1.3.8 NON-AVIATON FACILIITES

There is one non-aviation related area on Airport Property. In the northeast corner of Airport property, a portion of leased land is developed as mini-storage facilities and recreational vehicle storage. There is an existing land lease agreement for the non-aviation property.

1.4 CLIMATE – WIND AND WEATHER CONDITIONS

Climate conditions such as wind, temperature, cloud conditions, and precipitation types impact aircraft performance and significantly influence aviation activity. High temperatures can increase the required takeoff distance for aircraft, which could require payload reduction. **Table 1-14** summarizes the key climatic weather conditions for the Airport.

TABLE 1-14: CLIMATIC/METEOROLOGICAL SUMMARY

Climate Event	Climate Description	Value
Temperature	Daily Maximum Temperature (Hottest Month)	83.5°
	Annual Mean Maximum	63°
	Annual Mean Minimum	42°
	Hottest Month (Mean Maximum)	108°
	Hottest Month (Extreme)	August
	Average Annual Days Above 65°F	162
	Average Annual Days Above 90°F	15
Precipitation	Average Annual Days with Precipitation	178
	Average Annual Mean Rainfall Total	37”
	Mean Maximum Monthly Precipitation	8.3'
	Annual Days More Than .01"	138
	Snowfall Annual Mean Total	1"
	Snowfall Mean Maximum Month	January
Sky Conditions	Visual Flight Rule (VFR) Conditions	52.0%
	Instrument Flight Rule (IFR) Conditions	48.0%
	Low Instrument Flight Rule (IFR) Conditions	6.0%
	Days with Fog	133
	Days with Thunderstorms	4
Winds	Prevailing Wind Direction (From)	North
	Average Prevailing Wind Speed (From)	9 Knots

Source: NOAA, Climatic Meteorological Data Disk, Obtained 2017.

Wind

Wind patterns are vital in assessing runway use and determining runway design requirements according to FAA standards. Landing and taking off into the wind enhances aircraft performance. Additionally, there are limits to the amount of crosswind and tailwind aircraft can handle.

FAA standards for crosswind coverage are significant in determining the number of runways an airport needs, and in what direction they should be aligned. FAA standards state the most advantageous runway orientation is the one that provides the greatest wind coverage with minimum crosswind components. The desirable wind coverage for a runway is 95 percent for aircraft that are expected to use the airport at least 500 times per year. A runway orientation that provides less than 95 percent for the aircraft that use the airport at least 500 times per year may require a crosswind runway. The allowable crosswind component for each RDC is included in **Table 1-15. Table 1-16, Figure 1-10,** and **Figure 1-11** describe and illustrate the wind coverage for Runway 16/34.

TABLE 1-15: CROSSWIND COVERAGE STANDARDS

Runway Design Code	Allowable Crosswind Component
A-I and B-I	10.5 Knots
A-II and B-II	13 Knots
A-III, B-III, C-I through C-III, D-I through D-III	16 Knots
A-IV, B-IV, C-IV through C-VI, D-IV through D-VI	20 Knots
E-I through E-VI	20 Knots

Source: FAA AC 150/5300-13A – Change 1, *Airport Design*, February 2014

TABLE 1-16: CROSSWIND WIND COVERAGE

Runway	10.5-Knot Component	13-Knot Component	16-Knot Component	20-Knot Component
All-Weather Wind Data Observations (Percent Coverage)				
Runway 16/34	99.87%	99.96%	100.00%	100.00%
Instrument Wind Data Observation (Percent Coverage)				
Runway 16/34	99.94%	99.97%	99.99%	100.00%
Visual Wind Data Observations (Percent Coverage)				
Runway 16/34	99.85%	99.96%	100.00%	100.00%

Notes: Crosswind Component Computed Using Runway True Bearings (179.921 - 359.921)
All Weather Conditions: Period of Record, 2006 to 2016 with 111,273 Observations
IFR Weather Conditions: Period of Record, 2006 to 2016 with 24,591 Observations
VFR Weather Conditions: Period of Record, 2006 to 2016 with 87,088 Observations

Source: FAA AGIS Wind Data Observations (obtained October, 2017)

Runway 16/34 achieves greater than 95 percent crosswind coverage at 10.5 knots, 13 knots, 16 knots and 20 knots for all-weather, instrument, and visual conditions. According to FAA design standards, the existing single runway adequately provides crosswind coverage for aircraft operations.

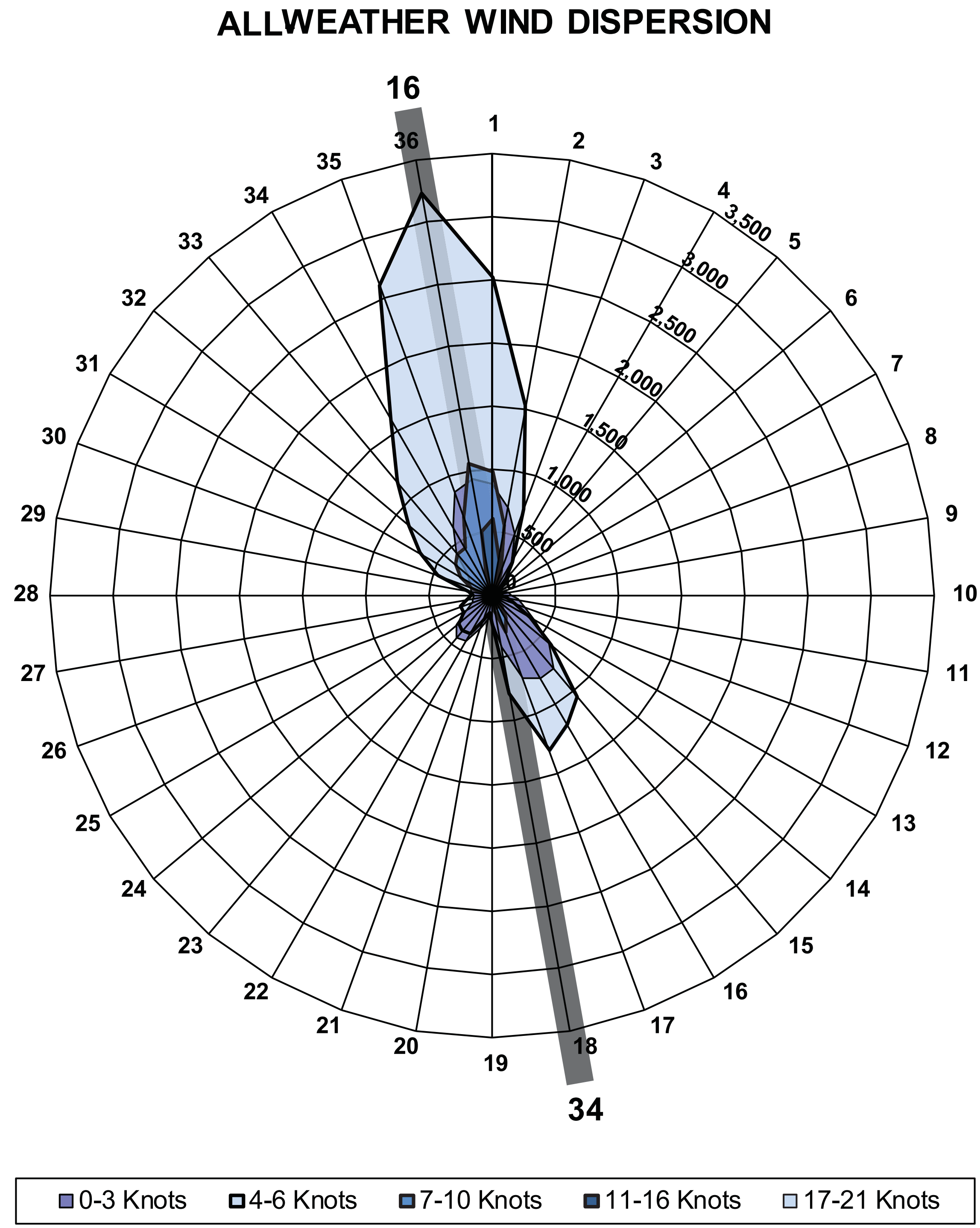
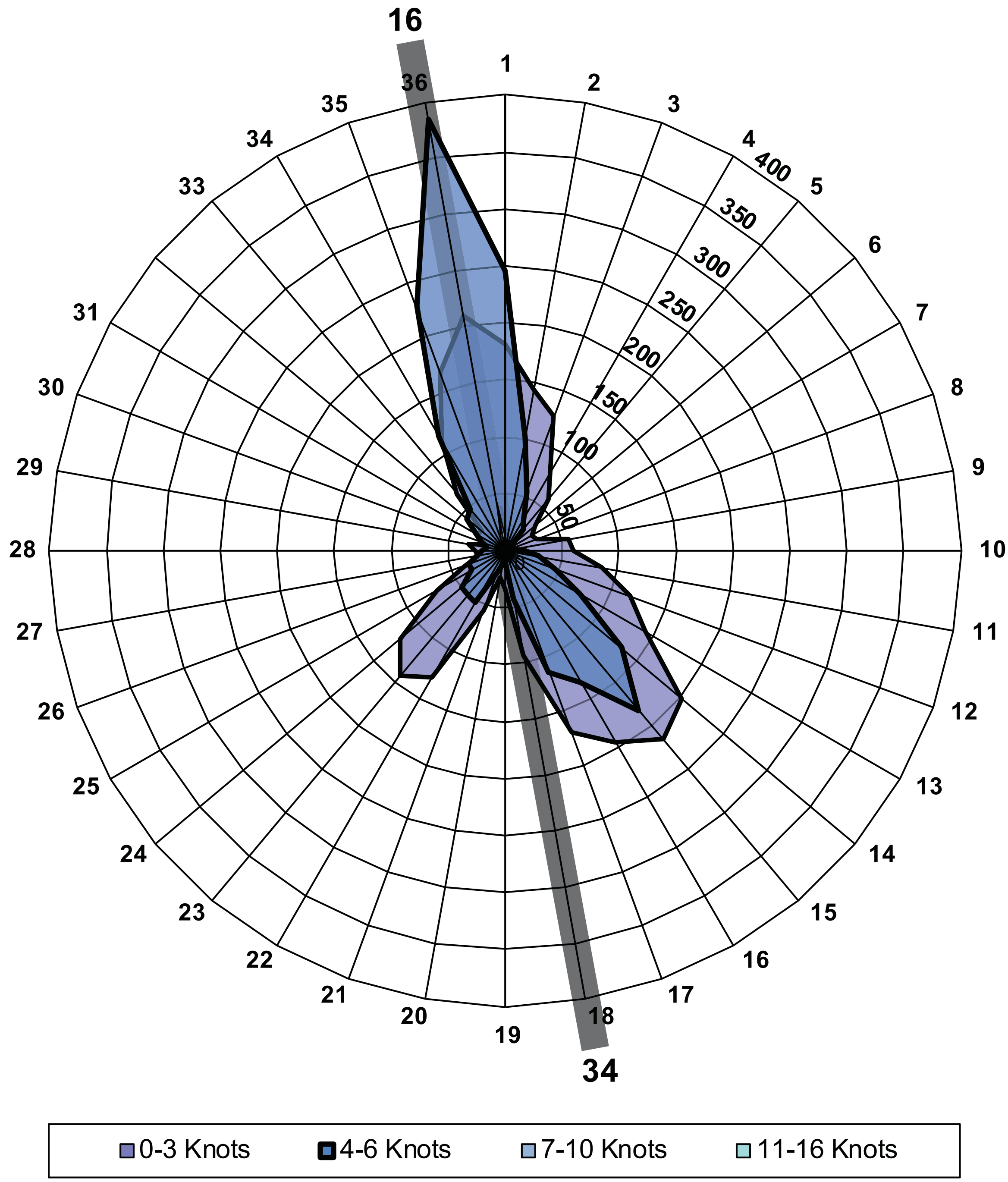


Figure 1-10
All-Weather Windrose

INSTRUMENT WIND DISPERSION



1.5 FINANCIAL OVERVIEW

Capital funding

Funding of capital improvement projects for the Airport comes from multiple sources and can vary depending on the project being carried out. The Airport is classified as a Regional Airport within the FAA's National Plan of Integrated Airport Systems (NPIAS). NPIAS is an inventory of aviation infrastructure assets in the U.S. maintained by the FAA. NPIAS identifies airports that are significant to the national air transportation in the U.S. and are therefore eligible for federal funding through the FAA Airport Improvement Program (AIP). AIP funding eligibility is primarily focused on airport compliance with airport safety standards and meeting capacity requirements for operational pavement surfaces of runways, taxiways, and aprons. Airports may also use AIP funds for airport master planning, environmental studies, and property acquisitions to meet capacity demands and safety standards. AIP projects are funded based on ordered priorities for safety, capacity, and facility maintenance. Capital development projects that are not AIP-eligible, typically on the landside of the RBG, are self-funded by the City or require other funding mechanisms such as loans or bonds.

AIP funding comes to airports in two funding streams. Roseburg is provided $150,000 per year in AIP non-primary entitlement grants, which can be accumulated over time to pay for larger projects. The FAA Regional Airport District Office may also award AIP grant funds through State apportionment and discretionary funding. At the Airport, the FAA covers AIP grants for 90 percent of the estimated project cost, with a 10 percent funding match required by the airport sponsor.

To meet the 10 percent AIP match requirement, the City of Roseburg has three typical funding options. As the airport sponsor, the City of Roseburg can provide the matching funds from the City's capital budget, loans, or bonds. The City can also apply for State of Oregon grant assistance. The requested State of Oregon grant assistance is handled by the Oregon Department of Aviation (ODA). State of Oregon grant assistance is not guaranteed as the grant funding is awarded based on state scoring related to project priorities and available funds.

The City may also apply for Connect Oregon grant funding. The Oregon Department of Transportation (ODOT) manages the Connect Oregon grant program, which offers funding assistance for non-highway transportation projects. Projects eligible for Connect Oregon grants include those for ports, rail, airports, public transit, and bike trails. Airport sponsors must submit project descriptions to local and regional transportation councils for approval and recommendations to State DOT planning authorities. The State awards funding based on priority scoring, meaning the grant funding is not guaranteed as the Airport sponsor is competing with all other Connect Oregon grant applicants. Connect Oregon grant funds can be used to satisfy the AIP match requirement, or as a stand-alone grant to fund an airport project that is not AIP eligible, or to match ODOT grant funding.

Operations Funding

Funding for the daily operational requirements comes from several sources including Airport revenue. Airport revenue is generated through property leases, hangar leases, fuel flowage fees, and user fees. Further explanation and details of the Airport's finances are in **Chapter 5, Capital Improvement Plan and Financial Feasibility**. Because RBG is a NPIAS airport, the City is obligated under FAA AIP grant assurance requirements to prevent diversion of Airport revenue to other city departments or projects.

1.6 ENVIRONMENTAL OVERVIEW

The information presented for the environmental overview is a high-level look provided for planning purposes and is not intended to satisfy the requirements of the National Environmental Policy Act (NEPA). A more detailed environmental overview report can be found in **Appendix C, Environmental Overview**. The following sections describe a baseline of the existing environmental conditions on and around the Airport:

- Air Quality
- Historical, Architectural, Archaeological, and Cultural Resources
- Section 4(f) Property
- Threatened and Endangered Species
- Water Quality
- Wetlands
- Farmland
- Floodplains
- Compatible Land use
- Solid Waste Recycling Plan

1.6.1 AIR QUALITY

The Federal Clean Air Act, last amended in 1990, requires the U.S. Environmental Protection Agency (EPA) to establish National Ambient Air Quality Standards (NAAQS) for pollutants considered harmful to the environment and to public health. The EPA has established NAAQS for six criteria pollutants: carbon monoxide, lead, nitrogen dioxide, particulate matter, ozone, and sulfur dioxide. A geographic area that has not consistently met the NAAQS is designated a *Non-Attainment Area*. Areas with a history of non-attainment that now consistently meet NAAQS are designated *Maintenance Areas*. The Federal Government cannot approve an action that is not supportive of the attainment and maintenance of NAAQS. The Airport, along with the City of Roseburg and Douglas County, are not in a NAAQS Non-Attainment or Maintenance Area for the State of Oregon.

The Oregon Department of Environmental Quality has responsibilities and authorities in Oregon for enforcing air quality regulations, issuing permits, and monitoring and reporting on NAAQS pollutants. Air Quality Index data from the monitoring station in Roseburg, which monitors particulate matter, showed air quality to be “good” for 326 days and “moderate” for 35 days in 2015, the most recent year published in an annual report. The 2015 data showed only one day with air quality considered “unhealthy for sensitive groups,” and that was due to forest fire activity.

1.6.2 HISTORICAL, ARCHITECTURAL, ARCHAEOLOGICAL, AND CULTURAL RESOURCES

This section will briefly address the regulations that apply to RBG, the cultural setting, and previous investigations of the Airport property.

Applicable Regulations

These state laws protect archaeological sites and cultural resources in Oregon: Indian Graves and Protected Objects (ORS 97.740-97.760) and Archaeological Objects and Sites (ORS 358.905-358.961). Under ORS 358.653, the City must consult with the State Historic Preservation Office to avoid inadvertent impacts to historic properties for which the City is responsible. This relates primarily to buildings and structures listed or eligible for listing on the National Register of Historic Places (NRHP). Generally, eligible historic properties are at least 50 years old, retain their historic appearance, and meet one of four National Register significance criteria. Based on a property inventory, no properties in the Airport study area meet these criteria.

Cultural Setting

People have been living along the Umpqua River since at least 3,000 years before present. The Roseburg area is within the traditional lands of the etnémi-tenéyu (Upper Umpqua) people (Berreman 1936; Miller and Seaburg 1990). Because minimal ethnographic studies were conducted among the Upper Umpqua, there is a lack of known village sites and utilization areas. However, there is archaeological evidence that the Upper Umpqua lived and used the area that is now Roseburg. The Upper Umpqua were severely impacted by disease and conflicts with non-Native people, who traveled through the area beginning in 1826. The Oregon-California Trail passed through today's Roseburg. Non-Native settlement of the Roseburg area began in the 1850s.

The Airport is within the homesteads of Joseph and Polly Lane, Margaret and Nedom Imbler, and Isaac and Anna Jones. Joseph Lane was Oregon Territory's first governor and was involved in many notable historical events. His homestead cabin was located northwest of the Airport. The Joneses lived southwest of the Airport, and the location of the Imblers' residence is unknown.

Constructed in 1928 by the City, RBG is one of Oregon's oldest airports. The U.S. Department of Commerce, Bureau of Air Commerce operated the Airport from 1935 until 1947. The runway was originally 3,800 feet long. During World War II the runway was gravel, and a fixed-base operator was added. In 1950, the City purchased additional property and extended and paved the runway. Nine years later, the City removed the original hangar and office buildings, which once stood on the northeast end of the runway, and constructed new buildings and structures on the southwest side of the airport instead. The City also constructed a paved taxiway parallel with the runway. Today, Airport boundaries include the site of a former mobile home park on the west side of the property.

Previous Investigations and Known Cultural Resources

Two cultural resources investigations have been conducted previously within the boundaries of the Airport. The first occurred in 1977 at the south end near NE Channon Ave, and the second, in 2009 at the north end of the property. The 1977 investigations did not identify any cultural resources. In 2009, one pre-contact-era isolated artifact, a cryptocrystalline silicate flake, was identified between 20 and 30 centimeters below surface within 16 feet of Newton Creek. The artifact was found in previously disturbed soils, and no additional artifacts were identified in surrounding shovel test probes.

The nearest recorded cultural resources are approximately one mile from the Airport study area to the northwest; one is a pre-contact-era site and one, a historic-era site associated with the Joseph Lane homestead. Neither has been evaluated for NRHP eligibility. To the northeast along Newton Creek are four resources: a pre-contact-era lithic scatter (unevaluated), and several isolated finds, none of which are considered eligible.

1.6.3 SECTION 4(F) PROPERTY

Section 4(f) of the U.S. Department of Transportation (DOT) Act of 1966 protects significant publicly owned parks, recreational areas, wildlife and waterfowl refuges, and public and private historic sites. Under Section 4(f), the Secretary of Transportation may approve a transportation program or project requiring the use of such sites only if there is no feasible and prudent alternative to using that land, and the program or project includes all possible planning to minimize harm resulting from the use.

Section 4(f) properties include:

- Parks and recreational areas of national, state, or local significance that are both publicly owned and open to the public;
- Publicly owned wildlife and waterfowl refuges of national, state, or local significance that are open to the public; and
- Historic sites of national, state, or local significance in public or private ownership regardless of whether they are open to the public.

The Airport is owned by the City of Roseburg and is considered a public facility. There are no public recreational areas or wildlife and waterfowl refuges on or adjacent to the Airport study area.

1.6.4 THREATENED AND ENDANGERED SPECIES

The Federal Endangered Species Act of 1973 (Act) provides for the protection and recovery of federally listed Threatened and Endangered plants and animals and their habitat. The Act is administered by the U.S. Fish & Wildlife Service (USFWS), which is responsible for terrestrial and freshwater organisms, and the National Marine Fisheries Service (NMFS), which has responsibilities for marine wildlife, including anadromous fish.

U.S. FISH AND WILDLIFE SERVICE SPECIES

A list of Threatened and Endangered species with potential ranges overlapping the study areas was obtained from the USFWS and is summarized in **Table 1-17**. Additional information for each species and its potential presence in the study areas can be found in the **Appendix C, Environmental Overview**.

TABLE 1-17: USFWS SPECIES WITH RANGES OVERLAPPING STUDY AREAS

Species Common Name (*Scientific Name*)	Listing Status	Critical Habitat
Birds		
Marbled Murrelet (*Brachyramphus marmoratus*)	Threatened	Designated. Does not include Study Area.
Northern Spotted Owl (*Strix occidentalis caurina*)	Threatened	Designated. Does not include Study Area.
Plants		
Kincaid's Lupine (*Lupinus sulphureus ssp. Kincaidii*)	Threatened	Designated. Does not include Study Area.

Marbled Murrelet

The marbled murrelet is a small seabird that spends the majority of its time on the ocean, but comes inland up to 50 miles to nest in forest stands with old growth characteristics. In Oregon, such forests are typically dominated by Douglas fir trees. The study area does not contain suitable habitat for marbled murrelet, and the nearest designated critical habitat is approximately 8 miles from the study area.

Northern Spotted Owl

Northern spotted owls live in conifer forests characterized by dense canopy closure of mature and old-growth trees, abundant logs, standing snags, and live trees with broken tops (USFWS). The Airport study area does not contain suitable coniferous forest habitat for this species. The nearest designated critical habitat for northern spotted owl is more than 10 miles from the study area.

Kincaid's Lupine

Kincaid's lupine is typically found in upland prairie remnants and transitions between grassland and forest. Douglas County represents the southern extent of the species' potential range. In contrast to the open prairie habitats of the more northerly Willamette Valley populations, Douglas County populations appear to be more shade tolerant and are often found at sites dominated by tree and shrub species, including Douglas fir, California black oak, Pacific madrone, ponderosa pine, incense cedar, and hairy manzanita. Based on the previous field investigations and lack of habitat typically suitable for this species, its presence within the Airport study area is unlikely.

National Marine Fisheries Service Species

Table 1-18 identifies the NMFS-managed species with potential presence in the study area watersheds.

TABLE 1-18: NMFS SPECIES WITHIN STUDY AREA WATERSHEDS

Species Common Name (*Scientific Name*)	Listing Status	Critical Habitat
Fish		
Oregon Coast Coho Salmon (*Oncorhynchus kisutch*)	Threatened	Designated. Includes South Umpqua River. Does not include Newton Creek in Airport Study Area.

Oregon Coast Coho salmon are present in the Lower South Umpqua River and in Newton Creek, which is a South Umpqua tributary that transects the Airport study area. The City incorporated fish passage improvements into the Newton Creek culvert extension required as part of the airport taxiway separation project constructed in 2013.

1.6.5 WATER QUALITY

The Airport study area is within the Newton Creek-South Umpqua River watershed. Newton Creek, which flows through the Airport study area, discharges to the South Umpqua River approximately nine miles upstream of the confluence with the North Umpqua River. The airport study area includes five stormwater drainage sub-basins that drain northwest to Sweetbriar Creek, west and southwest to Newton Creek, and south to Sleepy Hollow Creek. All three receiving streams are tributaries of the South Umpqua River.

Stormwater discharges at the airport are regulated under a National Pollutant Discharge Elimination System (NPDES) general permit for industrial stormwater discharges (a 1200-Z permit), issued by the Oregon DEQ (Permit No. 13001). The City manages airport runoff under a Stormwater Pollution Control Plan to comply with NPDES permit conditions and minimize potential impacts to downstream water quality from operations including aircraft washing, fueling, and maintenance activities.

1.6.6 WETLANDS

For regulatory purposes under the Clean Water Act, the term *wetlands* means areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances does support, a prevalence of vegetation adapted for life in saturated conditions. Wetlands are protected by federal and state regulations for the many functions they provide, including flood control, water quality regulation, and fish and wildlife habitat.

Approximately seven acres of freshwater wetlands were delineated within the airport property boundaries in 2010 and 2011. The delineations were in association with two separate projects: a taxiway separation project, and a runway/taxiway extension project. Characteristics of the delineated wetlands are summarized in **Table 1-19** below. Refer to the **Appendix C, Environmental Overview** for additional details for a map of wetland locations.

TABLE 1-19: AIRPORT DELINEATED WETLANDS

Wetland ID[1]	Size	Cowardin Class	HGM Class	Dominant Vegetation
A1	2.9 acres	Palustrine Emergent	Depressional Closed-Non-Permanently Flooded	Canada bluegrass, Tall fescue, American speedwell, Watson's willow-herb, Curly dock
A2	1.2 acres			
B	1.4 acres			Tall fescue, Common camas, Creeping buttercup
3	1.5 acres	Palustrine Emergent	Flat	Pennyroyal, Spreading rush, Soft brome
4	0.04 acres			Slender rush, Western buttercup,
5	0.05 acres			Soft rush, Spreading rush, Pointed rush

1: Wetland ID refers to the identifiers used in the delineation reports completed by Vigil-Agrimis (2010) *and Land and Water Environment Services (2011).*

The previous wetland delineations covered specific portions of the Airport and were used to support U.S. Army Corps of Engineers and Oregon Department of State Lands permit applications for impacts associated with the taxiway separation and runway extension projects. Further development activities on the airfield would likely warrant further wetland field investigations.

1.6.7 FARMLAND

The Farmland Protection Policy Act is intended to minimize the impact federal programs have on the unnecessary and irreversible conversion of farmland to non-agricultural uses. The State of Oregon also has rules and programs in place requiring counties to inventory and preserve farmland through planning and zoning measures.

The airport study area contains soil types classified as “farmland of statewide importance,” including soil map units Bashaw clay, Curtin clay, Natroy clay, and Speaker loam. However, urban and built-up areas of those soils are not considered prime or important farmland. The airport study area does not contain land that is currently used for farming or zoned for farm use according to the City of Roseburg’s Zoning Map.

1.6.8 FLOODPLAINS

The Federal Emergency Management Agency (FEMA) administers the National Flood Insurance Program to reduce the impact of flooding on private and public structures. FEMA Flood Insurance Rate Maps (FIRMs) and digital floodplain data were reviewed for the airport.

There is a FEMA-mapped, 100-year (1-percent annual chance) floodplain associated with Newton Creek within the airport study area, as identified on FEMA FIRM Panel 41019C1726F, effective February 17, 2010. Refer to **Appendix C, Environmental Overview** for additional details.

Approximately 600 feet of Newton Creek is conveyed under the airport runway and taxiway in a culvert. The FEMA FIRM identifies a regulatory floodway along the Newton Creek channel upstream and downstream of the culvert, with areas adjacent to the channel identified as 1-percent annual chance flood hazard zones (Zone AE: an area inundated by 1-percent chance annual flooding, for which base flood elevations [BFEs] have been determined).

1.6.9 COMPATIBLE LAND USE

The Airport is located within City of Roseburg city limits. The zoning code for the City identifies Airport property as an "Airport District." Section 2.6.010 of City of Roseburg Land Use and Development Ordinance (LUDO) states that the purpose of the Airport District is to protect airport facilities and operations from incompatible users, to provide for future airport expansion, and to preserve airport lands for future commercial and industrial uses that will directly depend on air transportation.

Airport Impact Overlay

The City of Roseburg LUDO requires that land within and surrounding the Airport District is subject to the Airport Impact Overlay (City of Roseburg LUDO, Article 8, Chapter 2). The Airport Impact Overlay protects the viability of the Airport and safety of the public community by ensuring that development within areas impacted by Airport operations are appropriately planned to mitigate airspace obstructions through height restrictions and other land use controls. The zones outlined in the Airport Impact Overlay are based on Federal Aviation Regulations Part 77 surfaces that identify protected airspace from the 14 Code of Federal Regulations Part 77. In addition to the Part 77 surfaces, the Airport Impact Overlay identifies protected areas for the Airport Approach Surface and RPZ.

Noise

Noise contours will be created for the Airport in a subsequent chapter of this Master Plan in conjunction with **Chapter 2, Aviation Activity Forecasts**, to support the review of proposed land use. However, the noise contours will provide only one factor for reviewing proposed land use. The FAA considers the Day/Night Noise Level (DNL) 65 dB an acceptable level at which residential land uses are compatible. Oregon Administrative Rule 340-035-0045 contains the State of Oregon criteria for airport noise. The State of Oregon uses the 55 DNL contour to represent the *airport noise criterion*. The airport noise criterion does not indicate liability or legal obligation on the part of the Airport. The airport noise criterion defines the *airport noise impact boundary*, which is used to identify noise sensitive properties near the Airport that may experience regular aircraft noise exposure.

Land Use Within An RPZ

The FAA's Memorandum *Interim Guidance on Land Uses Within a Runway Protection Zone* serves as a guidance document for allowable land uses within a RPZ.

1.6.10 SOLID WASTE RECYCLING

The *FAA Modernization and Reform Act of 2012* included two changes related to recycling, reuse, and waste reduction at airports. The first expanded the definition of airport planning to include planning for recycling and minimizing waste generation. The second added a provision that airports preparing a master plan address issues related to solid waste recycling, including feasibility of recycling, minimizing waste generation, operation and maintenance requirements, review of waste management contracts, and potential for cost savings or revenue generation. The FAA's memorandum titled "Airport Recycling, Reuse, and Waste Reduction Plan" and dated September 30, 2014, explains that the expected scope of recycling planning is correlated to the size and activity level of a facility.

Based on information provided by the FBO, waste generated by FBO activities is accumulated in a single, 4-cubic-yard dumpster and collected on a weekly basis by Roseburg Disposal, a waste hauling company. The estimated annual cost for this service is $2,550.00. The contract or agreement governing this service was not reviewed under this project. Two of the Airport's tenants use their own 20-gallon trash cans outside their hangars and contract for waste hauling services from the same company.

Aluminum cans generated at the facility are returned for a deposit under the State of Oregon's Beverage Container Act. The Airport's waste hauling company offers residential recycling collection and recycling drop-off facilities; however, the company does not offer commercial recycling collection services. Potentially recyclable materials generated at the Airport, such as cardboard, glass, newspaper, plastic, and tin, are disposed of in the landfill-bound waste stream.

Feasibility of recycling at RBG is dependent on many factors, including the availability of commercial recycling services or labor to collect and haul recyclables to a drop-off site. The current program is the responsibility of the FBO; adding recycling for other materials could increase the demand for resources such as time, labor, and spending. Diverting materials to recycling has the potential to reduce costs or generate revenue based on waste hauling fees, adjustments to the dumpster size or collection schedule, and recycling rebates.

1.7 INVENTORY SUMMARY

Inventory Summary

Runways

- Runway 16/34: 5,003 ft. x 100 ft.
    - 5,003 ft. TORA
    - 5,003 ft. TODA
    - 5,003 ft. ASDA
    - Runway 16 3,902 ft. LDA
    - Runway 34 4,631 ft. LDA

Runway Condition and Navigational Aids

- Runway 16/34
    - Good Pavement Condition
    - Medium Intensity Runway Lights (MIRL)
    - Non-Precision Runway Markings
- Runway End 16
    - Runway End Identifier Lights (REIL)
- Runway End 34
    - Runway End Identifier Lights (REIL)
    - (Future) Precision Approach Path Indicator (PAPI)

Airport Navigational Aids

- Non-Directional Beacon (NDB)
- Automated Surface Observing System (ASOS)
- Primary Wind Cone and Segmented Circle

Instrument Procedures

- Runway 34
    - RNAV (GPS)
    - VOR-A
    - VOR-DME

Aircraft Parking

- 59 – Single Tie-downs
- 11 – Twin Tie-downs
- 2 – Helicopter Parking Spots

Aircraft Storage

- 59 – Single-Engine T-Hangars
- 12 – Multi-Engine T-Hangars
- 18 – Corporate Box Hangars

Fuel Facilities (FBO)

- 12,000-gallon Jet-A
- 12,000-gallon 100-LL
- 2,000-gallon Jet-A Truck
- 700 gallon 100-LL Truck

Airport Deficiencies

- No full-length parallel taxiway
- No end connector taxiway for the Runway 16 end
- No on-Airport road access between the north and south aprons
- Loss of nighttime circling approach
- No aiming point markings for Runway 16/34
- Non-Standard ROFA
- Incompatible land uses in RPZs

AVIATION ACTIVITY FORECASTS

CH. 2

ROSEBURG REGIONAL AIRPORT
CHAPTER 2: AVIATION ACTIVITY FORECASTS

2.1 FORECAST OVERVIEW

The City of Roseburg and Douglas County are growing across all indicators. In the ten years between 2006 and 2016, Woods and Poole data indicates the population of Douglas County has grown by 2.4 percent, gross regional product has grown by 12.5 percent, and employment has almost completely recovered to pre-recession levels. Census data indicates that the population in the City of Roseburg has been increasing at the same time as Douglas County and at a faster rate.

Total operations at Roseburg Regional Airport (RBG or the Airport) have increased by 35.6 percent over the last ten years. Based aircraft are expected to total 104 by 2036 with jets seeing the largest growth of four additional based aircraft categories. RBG, with its fixed base operator (FBO), fuel for both piston and jet aircraft, and no control tower, remains the primary general aviation (GA) airport in Douglas County for both piston aircraft and jet traffic. **Table 2-1** shows a summary of the demand forecasts.

TABLE 2-1: FORECAST SUMMARY

Category	2006	2016	2036	CAGR 2016-2036
Aircraft Operations	**23,506**	**31,869**	**38,350**	**0.9%**
Itinerant Operations				
Air Carrier	0	0	0	0.0%
Commuter/Air Taxi	200	2,550	2,700	0.3%
GA	21,346	17,609	22,900	1.3%
Military	0	50	50	0.0%
Local Operations				
GA	1,960	11,660	12,700	0.4%
Military	0	0	0	0.0%
Based Aircraft	**96**	**98**	**104**	**0.3%**
Single-Engine Piston	82	78	81	0.2%
Multi-Engine Piston	6	9	8	-0.6%
Jet & Turbo-Prop	4	8	11	1.6%
Helicopter	4	3	4	1.4%
Other	0	0	0	0.0%

Note: Year corresponds to FAA Fiscal Year, October to September.

CAGR: Compound Annual Growth Rate

Source: FAA Terminal Area Forecast for 2006 and 2016, Master Plan forecasts for 2036.

2.2 INTRODUCTION TO FORECASTS

Aviation activity forecasts evaluate the future demand at the Airport. This chapter forecasts the following:

- Based Aircraft
- Aircraft Operations (Itinerant and Local)

Forecasts have a base year of 2016, and use the Federal Aviation Administration (FAA) fiscal year (October to September). The base year is 2016 because that is the last year of complete data available when the forecasts were prepared. The forecast period is 20 years with reporting intervals of every five years. Multiple forecasting methodologies are used with each activity, and are compared with the FAA Terminal Area Forecast (TAF).

Forecasts help determine if existing airport facilities are sufficient or will need to be modified to handle future demand (operations, and based aircraft). The FAA Seattle Airports District Office reviews forecasts for rationality and comparison to the FAA TAF.

The chapter is organized in the following sections:

- Community Profile
- Aviation Activity Profile
- General Aviation Forecasts
- Critical Aircraft
- Forecast Summary

Table 2-2 describes the data sources used in this chapter.

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.

Based Aircraft

Aircraft that are stored at RBG, either full-time or seasonally.

Critical Aircraft

The most demanding aircraft (in terms of size and/or speed) to use an airport more than 500 times a year or to have scheduled operations at an airport.

General Aviation

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

Itinerant Operation

An operation that originates at one airport and terminates at a different airport, for example an aircraft flying from RBG to another airport.

Local Operation

An operation that originates and terminates at the same airport. For example, an aircraft takes off from RBG, remains near the airport to practice flight maneuvers, and then lands at RBG.

Touch-and-Go

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

TABLE 2-2: DESCRIPTION OF DATA SOURCES

Source	Description
FAA TAF	The FAA TAF, published in January 2017, provides forecasts for operations and based aircraft at RBG. These forecasts serve as a comparison for forecasts prepared as part of this planning effort, and provide historical information on aircraft activity. Due to the absence of a control tower at RBG, the TAF does not provide much historical context.
FAA Aerospace Forecast	The Aerospace Forecast 2017-2037 is a national-level forecast of aviation activity. The Aerospace Forecast helps guide local forecasts by serving as a point of comparison between local trends and national trends.
Traffic Flow Management System Counts (TFMSC)	The TFMSC includes data collected from flight plans. These operations are categorized by aircraft type and used to identify trends in the RBG fleet mix. The advantage of the TFMSC data is its degree of detail and insights into the itinerant users of RBG. A disadvantage of TFMSC data is it does not include local operations or operations that did not file a flight plan. As such, the utility of TFMSC data is limited to larger aircraft, including scheduled commercial passenger, cargo, and charter operators, and private business jets.
Socioeconomic Data	Socioeconomic data is provided by data vendor Woods & Poole, Inc. (W&P). The Census provides population estimates for the City of Roseburg and Douglas County with the most recent estimates coming from the 2015 American Community Survey. The Census provides the current estimate for 2016 as of July 1, 2016. Census data was used to compare the population of Roseburg to Douglas County. Data is from 2010 to 2016. The City of Roseburg Comprehensive Plan was consulted; however, it is dated and does not reflect the best available information. The City of Roseburg's Comprehensive Plan was last completed in 1984 with updates through 2011. The Douglas County Comprehensive Plan was revised in 2015. The Douglas County Comprehensive Plan was consulted to better understand the growth in population. The W&P dataset considers the Douglas County Metropolitan Statistical Area (MSA), and provides 124 data categories with records from 1970 to 2016, and forecast through 2040. Data categories considered include population, employment, earnings and income, and gross regional product.

---- Continued on Next Page ----

TABLE 2-2: DESCRIPTION OF DATA SOURCES (CONTINUED)

Source	Description
State Plans	The Oregon Aviation System Plan (OASP) was last prepared in 2007, and projects aviation activity through 2025 from the forecast base year of 2005. The OASP projects that GA operations in the state will increase from 1,917,541 operations in 2015 to 2,216,213 in 2025. Based aircraft will increase from 4,875 in 2015 to 6,225 in 2025. RBG is listed as a Category III – Regional General Aviation Airport.
Stakeholders	The aviation forecasting team collected data from the airport sponsor, the City of Roseburg.
FBO	While fuel consumption data was consulted, the data was incomplete and was not used.
FlightAware.com (FlightAware)	FlightAware compiles flight plan data from over 50 government sources (in Europe, the Americas, and Oceania), dozens of airlines, commercial data providers, as well as thousands of receivers in FlightAware's ADS-B flight tracking network. Similar to the TFMSC, a disadvantage of FlightAware data is it does not include local operations or operations that did not file a flight plan.

2.3 COMMUNITY PROFILE

The community profile describes the location of RBG and the community it serves. RBG is in the Roseburg Micropolitan Statistical Area (MSA), which coincides with the boundary of Douglas County. The MSA includes the service area of the Airport. This section describes the community population, employment and economic development, gross regional product (GRP), and the catchment areas and competition. These characteristics comprehensively form RBG's community profile. **Figure 2-1** shows the MSA for RBG.

2.3.1 POPULATION

Table 2-3 shows the Woods & Poole population records for the MSA from 2006 to 2016 and the forecast through 2036. The MSA grew at a compound annual growth rate (CAGR) of 0.2 percent from 2006 and 2016, increasing the total population by more than 2,500. The MSA population is forecasted to grow at a CAGR of 0.4 percent, reaching more than 117,000 by 2036. **Table 2-4** shows census estimates to compare the City of Roseburg and Douglas County populations. The City of Roseburg makes up 20.7 percent of the total population in Douglas County.

The City of Roseburg and Douglas County have been experiencing growth from 2011 to 2016. The City of Roseburg has a CAGR of 1.2 percent and Douglas County has a CAGR of 0.2 percent, meaning the City of Roseburg has been growing faster than the other communities in Douglas County.

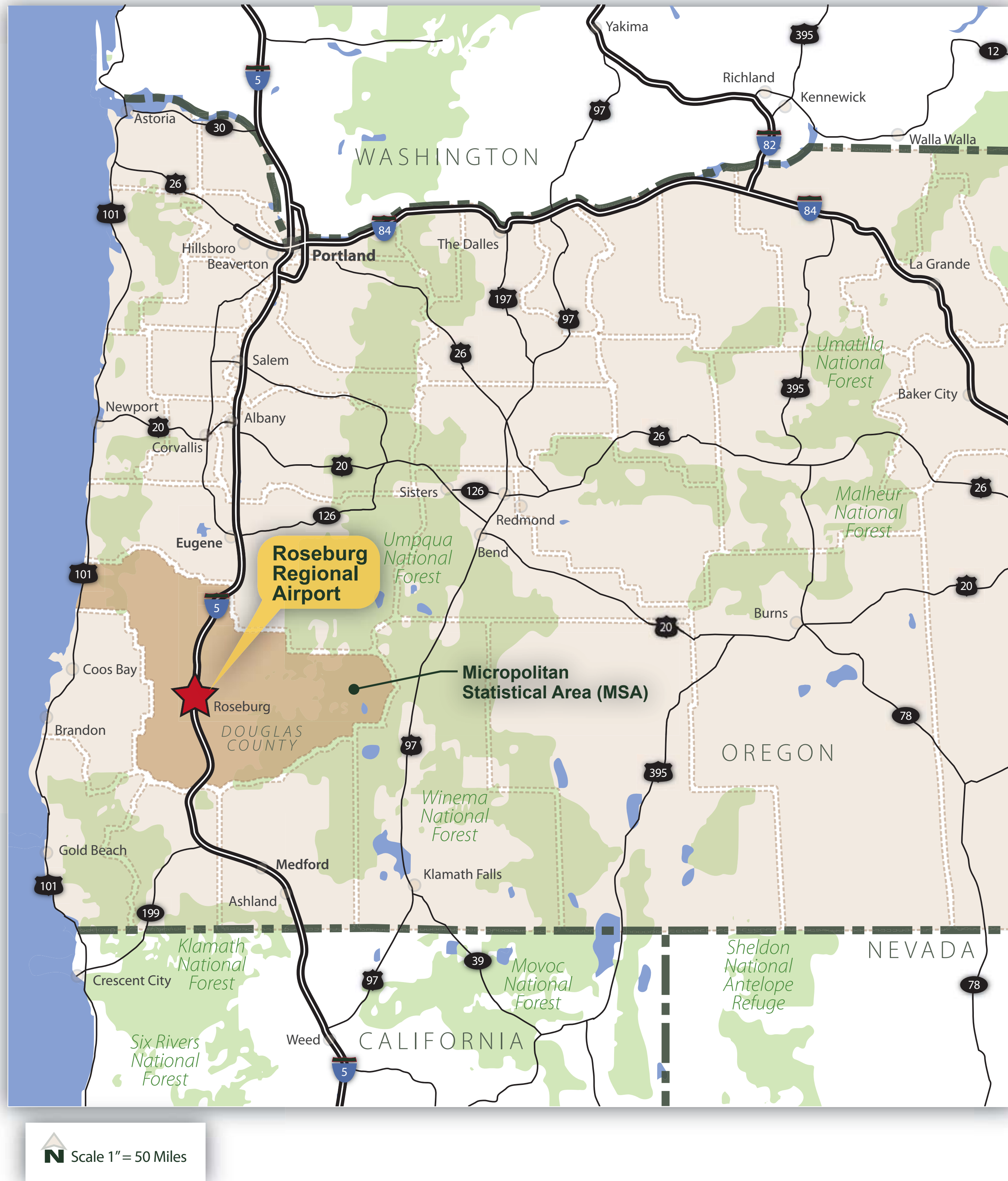


Figure 2-1
Micropolitan Statistical Area (MSA)

Table 2-3: MSA Population

Year	Population	Percent Change
2006	105,754	N/A
2011	107,293	1.5%
2016	**108,276**	**0.9%**
2021	110,789	2.3%
2026	113,276	2.2%
2031	115,553	2.0%
2036	117,440	1.6%
CAGR (2006-2016)	0.2%	N/A
CAGR (2016-2036)	0.4%	N/A

CAGR: Compound Annual Growth Rate

Source: Woods & Poole

Table 2-4: Population Comparisons

Year	City of Roseburg	Percent of County Population	Percent Change	Douglas County	Percent Change
2011	21,129	19.7%	N/A	107,279	N/A
2012	21,542	20.1%	2.0%	107,111	-0.2%
2013	21,746	20.4%	0.9%	106,803	-0.3%
2014	21,858	20.4%	0.5%	106,978	0.2%
2015	21,937	20.4%	0.4%	107,525	0.5%
2016[1]	22,437	20.7%	2.3%	108,457	0.9%
CAGR	1.2%	1.0%	N/A	0.2%	N/A

1: 2016 U.S Census Population Estimate as of July 1, 2016

CAGR: Compound Annual Growth Rate

Source: U.S Census 2015 ACS 5-Year Population Estimate

2.3.2 EMPLOYMENT AND ECONOMIC DEVELOPMENT

In terms of economics, Woods & Poole data indicate that the economy of the Douglas MSA has shown recovery since the end of 2007-2009 recession. MSA employment initially dropped by 7.9 percent from 2006 and 2011 due to the recession, but has returned to growth since, with total employment growing at an annual average rate of 0.3 percent from 2009 to 2016. Employment per capita dropped from 0.50 in 2006 to 0.46 in 2011. Economic recovery continues to increase total employment, with a 3.8 percent increase between 2011 and 2016. Employment per capita continues to recover with an increase from 0.46 to 0.47 between 2011 and 2016. Woods & Poole forecasts total employment to continue growing over the next twenty years with a CAGR of 0.8 percent.

Top industries by total employment in 2006 were state and local government, retail trade, manufacturing, health care, and accommodation and food services. These industries continued to make up the top five industries by employment in 2016 with health care overtaking retail trade and manufacturing. From 2011 to 2016, every industry in the top five, excluding state and local government, saw recovery in total employment. Forecasts show that, by 2026, health care will employ the most people in the MSA and that manufacturing will decline. This is due to the decline in labor intensive industries (construction, mining, and manufacturing) and growth in less labor-intensive industries like healthcare and professional services. Total employment and jobs per capita are presented in **Table 2-5**. Top industries by employment and sales are presented in **Table 2-6**.

Table 2-5: MSA Employment

Calendar Year	Total Employment	Percent Change	Employment/Capita
2006	53,397	N/A	0.50
2011	49,188	-7.9%	0.46
2016	**51,051**	**3.8%**	**0.47**
2021	53,641	5.1%	0.48
2026	56,043	4.5%	0.49
2031	58,151	3.8%	0.50
2036	60,030	3.2%	0.51
CAGR (2006-2016)	-0.4%	N/A	-0.7%
CAGR (2016-2036)	0.8%	N/A	0.4%

Note: Employment per Capita = Total Employment / Total Population

CAGR: Compound Annual Growth Rate

Source: Woods & Poole

Table 2-6: Top Industries by Employment and Retail Sales

MSA Top 5 Industries by Employment 2006 – 2016								
Rank	**2006**		**2011**			**2016**		
	Industry	**Jobs**	**Industry**	**Jobs**	**Δ**	**Industry**	**Jobs**	**Δ**
1	State and Local Gov.	6,432	State and Local Gov.	6,262	(2.6%)	State and Local Gov.	6,188	(1.2%)
2	Retail Trade	6,207	Health Care	5,792	(2.6%)	Health Care	5,935	2.5%
3	Manufacturing	6,206	Retail Trade	5,525	(11.0%)	Retail Trade	5,834	5.6%
4	Health Care	5,949	Manufacturing	4,507	(27.4%)	Manufacturing	4,966	10.2%
5	Accom. + Food Serv.	3,453	Accom. + Food Serv.	3,282	(5.0%)	Accom. + Food Serv.	3,378	2.9%
MSA Top 5 Industries by Retail Sales 2006 – 2016								
Rank	**2006**		**2011**			**2016**		
	Industry	**Sales ($M)**	**Industry**	**Sales ($M)**	**Δ**	**Industry**	**Sales($M)**	**Δ**
1	F&B Retail	$250.5	Gasoline Stations	$297.7	26.8%	Gasoline Stations	$295.8	(0.7%)
2	Motor Vehicles	$243.0	F&B Retail	$255.6	2.0%	F&B Retail	$270.1	5.7%
3	Gasoline Stations	$234.9	Gen. Merchandise	$216.0	(1.0%)	Motor Vehicles	$268.8	27.0%
4	Gen. Merchandise	$218.1	Motor Vehicles	$211.6	(12.9%)	Gen. Merchandise	$223.0	3.2%
5	Eating + Drinking	$126.8	Eating + Drinking	$132.7	4.6%	Eating + Drinking	$149.7	12.8%
MSA Top 5 Industries by Employment 2016 – 2036								
Rank	**2016**		**2026**			**2036**		
	Industry	**Jobs**	**Industry**	**Jobs**	**Δ**	**Industry**	**Jobs**	**Δ**
1	State and Local Gov.	6,188	Health Care	7,010	18.1%	Health Care	8,139	16.1%
2	Health Care	5,935	State and Local Gov.	6,672	7.8%	State and Local Gov.	6,874	3.0%
3	Retail Trade	5,834	Retail Trade	6,257	7.3%	Retail Trade	6,575	5.1%
4	Manufacturing	4,966	Manufacturing	4,935	(0.6%)	Admin. + Waste	4,815	24.6%
5	Accom. + Food Serv.	3,378	Admin. + Waste	3,863	29.0%	Manufacturing	4,663	(5.5%)
MSA Top 5 Industries by Retail Sales 2016 – 2036								
Rank	**2016**		**2026**			**2036**		
	Industry	**Sales ($M)**	**Industry**	**Sales ($M)**	**Δ**	**Industry**	**Sales($M)**	**Δ**
1	Gasoline Stations	$295.8	Gasoline Stations	$324.6	9.8%	Gasoline Stations	$353.7	9.0%
2	F&B Retail	$270.1	Motor Vehicles	$299.6	11.5%	Motor Vehicles	$308.4	2.9%
3	Motor Vehicles	$268.8	F&B Retail	$278.4	3.1%	Gen. Merchandise	$289.0	12.7%
4	Gen. Merchandise	$223.0	Gen. Merchandise	$256.4	15.0%	F&B Retail	$282.3	1.4%
5	Eating + Drinking	$149.7	Eating + Drinking	$175.9	17.5%	Eating + Drinking	$205.3	16.7%

Notes: Δ = Total percent change from period before (10 years). Retail sales presented in millions of inflation-adjusted 2016 dollars. Accom. + Food Serv. = Accommodation and Food Services (e.g. hotels). F&B Retail = Food and Beverage Retail (e.g. grocery stores). Gen. Merchandise: = General Merchandise is a wide array of retail except for food and beverage (e.g. clothing, hardware, etc.). Admin. + Waste = Administration and Waste Services.

Source: Woods & Poole

2.3.3 GROSS REGIONAL PRODUCT (GRP)

GRP is the value of goods and services produced in the MSA. GRP serves as an index for the health of the overall economy. GRP increases as the economy produces more goods, more valuable goods, and a combination of the two. **Table 2-7** shows the GRP of the MSA from 2006 to 2036.

Table 2-7: MSA Gross Regional Product

Calendar Year	GRP ($M)	Percent Change
2006	$3,353	
2011	$3,558	6.1%
2016	$3,773	6.0%
2021	$3,998	6.0%
2026	$4,209	5.3%
2031	$4,394	4.4%
2036	$4,560	3.8%
CAGR		
'06 - '16	1.2%	N/A
'16 - '36	1.0%	N/A

Note: GRP is inflation-adjusted 2016 dollars

Source: Woods & Pool

2.3.4 CATCHMENT AREA AND COMPETITION

An airport's "catchment area" is the geographic boundary from which it draws its users, and airport activity is primarily influenced by the movement of people and products to and from the catchment area. Catchment areas are defined by the types of services offered at an airport, proximity of competitor airports, and the tendency of the local population to use the airport.

RBG is one of three GA airports serving Douglas County. Douglas County has three other GA airports, Myrtle Creek Municipal Airport (16S), George Felt Field (5S1), and Toketee State Airport (3S6). 5S1 is two miles away and 16S is fifteen miles away from RBG, and these airports provide GA users with choices for aircraft storage and service. 3S6 is owned by United States Forest Services (USFS), managed by the Oregon Department of Aviation, and is open to the public; however, 3S6 is closed from November 1 to May 1 each year. There are no commercial service airports in the County. The closest commercial service airports to Douglas County are the Eugene Airport, approximately 65 miles to the north of Roseburg, and the Rogue Valley International – Medford Airport, approximately 90 miles to the south.

Table 2-8: Regional General Aviation Airports

	Characteristics			Markets Served			
Airport	**Runway Length**	**Instrument Procedure**	**Jet A & FBO**	**Large Jets**	**Small Jets**	**Turbo-Props**	**Piston**
Roseburg (RBG)	5,003 feet	Non-Precision	Yes	No[1]	Yes	Yes	Yes
Myrtle (16S)	2,600 feet	Non-Precision	No	No	No	Yes	Yes
Felt (5S1)	2,300 feet	Visual	No	No	No	Yes	Yes
Toketee (3S6)	5,350 feet	Visual	No	No	No	Yes	Yes

1: Large jets can and do land at RBG. However, the lack of a precision instrument approach means that it does not have all-weather reliability that owners of large jets look for when basing their aircraft. RBG serves large jets on an itinerant basis but does not have any based large jets.

Sources: Airport Facilities: FAA Airport Facilities Directory; Primary Market: Consultant assessment derived from based aircraft records and available facilities (runway length, fuel, instrument procedure

Markets served by each airport are described in **Table 2-8**. Determination of market does not indicate the most common aircraft type at an airport, or suggest that a market that is not served will never use an airport. Rather, it reflects the presence of facilities at an airport that cater to the needs of a certain market. For example, piston aircraft are versatile in that they do not need Jet A fuel or a long runway. They tend not to be operated when visibility is particularly low or during stormy weather due to their susceptibility to strong winds and turbulence. For this reason, piston aircraft owners generally have fewer requirements for the airport where they base their aircraft than business jet owners have.

Large jets, such as a Gulfstream V, can and do land at RBG. However, the lack of a precision instrument approach means that the Airport does not have all-weather reliability owners of large jets look for when choosing a permanent base for their aircraft. RBG serves large jets on an itinerant basis but does not have any based large jets. Existing based jet aircraft include the Cessna Citation Mustang, Cessna Citation II, and Cessna Citation I.

RBG is the only GA airport between Eugene and Medford to offer both 100 Low Lead (100LL) and Jet A fuel and to have an FBO. A FBO and both 100LL and Jet A fuel are services that attract GA pilots to the airport. The lack of services at 5S1 and 16S diminish the level of competition RGB has with these airports for GA users. **Figure 2-2** shows the catchment area for RBG.

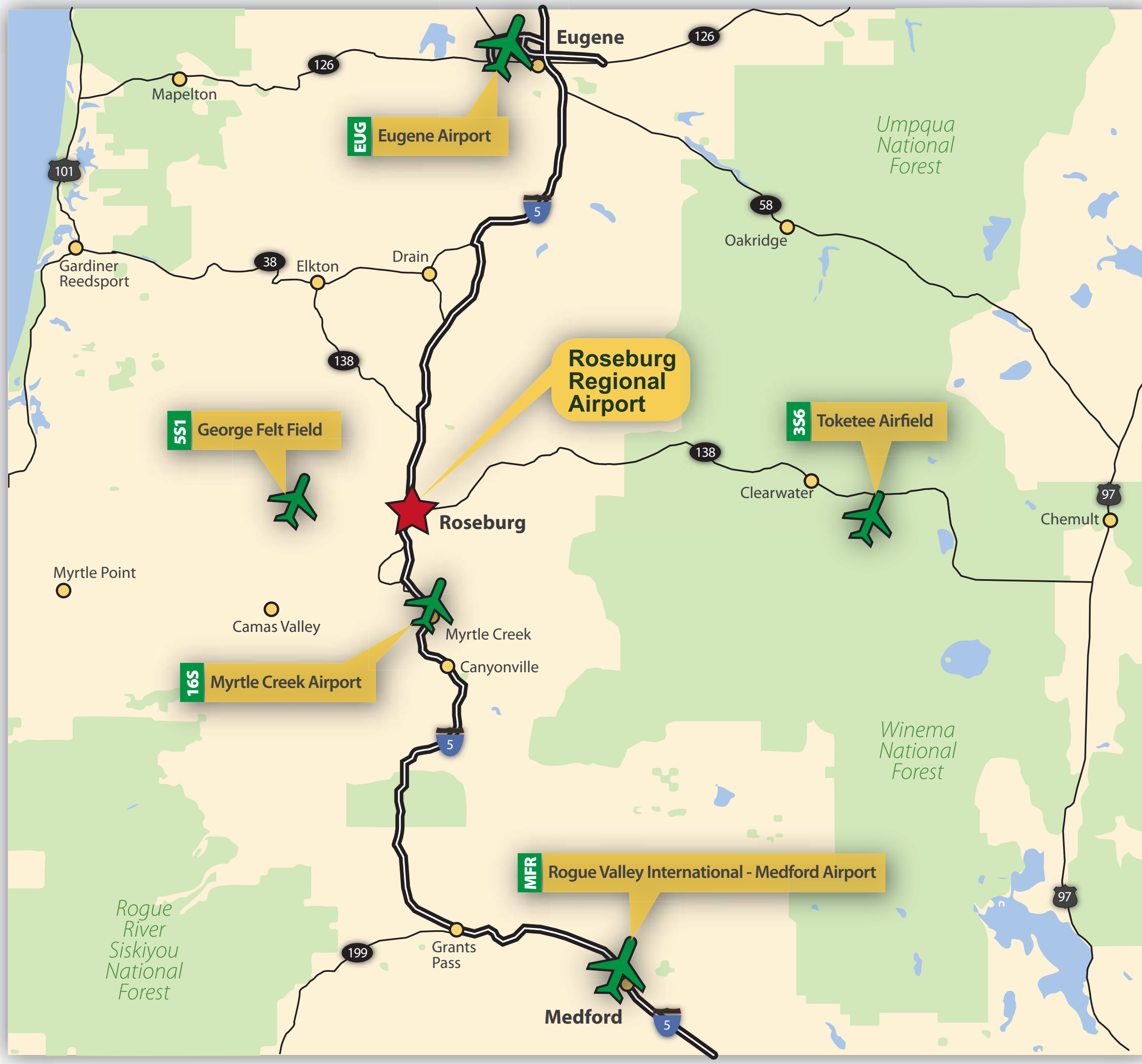


Figure 2-2
Surrounding Airports

2.4 AVIATION ACTIVITY PROFILE

The aviation activity profile is the baseline of the forecasts. The profile shows trends in activity at the Airport and explains what, how, and why changes have occurred. Sources for the information used in this document include the FAA, the City of Roseburg, and Airport tenants. This section is organized in the following order:

- FAA Terminal Area Forecast
- General Aviation
- Military
- Itinerant Air Taxi Operations

2.4.1 FAA Terminal Area Forecast (TAF)

The TAF is the official FAA forecast for airports prepared annually by FAA Headquarters for each airport in the FAA National Plan of Integrated Airport Systems. The TAF reports data using the FAA fiscal year (October to September). TAF data for RBG comes from FAA Form 5010, which the Airport submits annually to the FAA.

The FAA reviews forecasts prepared for the Master Plan by comparing them to the TAF. Forecasts that are within 10 percent of the TAF over the five-year period, and within 15 percent over the ten-year period can be approved by the Airports District offices. Forecasts outside of these tolerances go to FAA Headquarters for review.

The TAF forecasts passenger enplanements, operations, and based aircraft, but does not forecast operations by aircraft type, peak activity levels, critical aircraft, or air cargo. The January 2017 TAF was used for this forecast. The TAF provides a record of aviation activity at RBG from 1990 to 2016, and forecasts from 2017 to 2040. Due to the absence of an airport traffic control tower, records are considered estimates.

2.4.2 GENERAL AVIATION (GA)

GA describes flight activities that are not performed by passenger and cargo airlines and the military. GA is broad in scope – activities include, but are not limited to, flight training, recreational flying, private and corporate air transportation, emergency response, and flight testing of new aircraft. This section describes GA businesses and activities at RBG.

General Aviation Businesses

GA businesses include those that offer services to the flying public (for example, FBOs), those that design and construct aircraft, and companies that use aircraft as part of their business (for example, aerial photography, sightseeing, and employee transport). Western Oregon Flying Services LLC is the only FBO at RBG. This FBO sells 100 LL and Jet A fuel, and offers aircraft ground handling, oxygen service, aircraft parking (ramp or tiedown), hangars, passenger terminal and lounge, flight training, aircraft rental, aerial tours/aerial sightseeing, and aircraft charters.

Itinerant General Aviation Operations

Itinerant GA operations originate and terminate at different airports, as described previously. Operators can include business travelers, student pilots performing cross country training flights, and recreational pilots. The TAF indicates that itinerant operations made up 55 percent of overall GA operations at RBG in 2016, and have been declining at an annual average rate of 1.9 percent since 2006. This decline is less pronounced at RBG than it has been for the United States, which has declined at an average of 2.9 percent per from 2006 to 2016. Itinerant GA operations are shown in **Table 2-9**.

Table 2-9: Itinerant GA Operations

Year	RBG Operations	% Change	National Operations	% Change
2006	21,346	N/A	18,707,000	N/A
2007	21,493	0.7%	18,575,188	-0.7%
2008	17,490	-18.6%	17,492,653	-5.8%
2009	17,490	0.0%	15,571,066	-11.0%
2010	17,490	0.0%	14,863,856	-4.5%
2011	17,490	0.0%	14,527,903	-2.3%
2012	17,490	0.0%	14,521,656	0.0%
2013	17,490	0.0%	14,117,424	-2.8%
2014	17,490	0.0%	13,978,996	-1.0%
2015	17,490	0.0%	13,886,711	-0.7%
2016	17,609	0.7%	13,904,397	0.1%
CAGR	-1.9%	N/A	-2.9%	N/A

CAGR: Compound Annual Growth Rate

Source: FAA Terminal Area Forecast, FAA Aerospace Forecast

TAF operations are estimated for GA airports without a control tower like RBG. The itinerant GA operations estimate was updated from 2007 to 2008, which showed a loss of 4000 operations (-18.6 percent). The economic recession in 2008 led to operations declining nationally and not solely at RBG. Nationally, itinerant GA operations fell by approximately 1.1 million operations (-5.8 percent) in 2008 and declined further in 2009, by approximately 1.9 million operations (-11.0 percent). The TAF shows no change in itinerant GA operations at RBG between 2008 and 2015. Operations increased by 0.7 percent from 2015 to 2016.

National itinerant GA operations declined at a CAGR of 2.9 percent from 2006 to 2016. The decline in national itinerant operations is indicative of an industry in the process of adjustment. Some GA sectors are growing while others are declining. The 2017 FAA Aerospace Forecast shows that, in 2016, aircraft with piston engines made up 68 percent of the national GA fleet, and turbine (jet and turbo-prop) aircraft made up 15 percent. Hours flown by piston aircraft have declined by an annual average of 1.4 percent since 2010, while hours flown by turbine aircraft have grown by 1.9 percent per year. Similarly, the overall number of active piston aircraft has declined by an annual average of 1.7 percent while active turbine aircraft have grown by an annual average of 1.9 percent. The number of active rotorcraft (helicopters) have grown by an annual average of 1 percent, and other aircraft (experimental, sport, gliders, ultralights) declined by an annual average of 0.5 percent since 2010.

The GA market is readjusting to a more even distribution of piston and turbine aircraft, albeit slowly. With the dominant piston market in decline, overall operations will continue to drop; however, there are growing segments within the itinerant GA market due to helicopter and turbine growth.

Two factors that help RBG sustain its level of itinerant GA operations are the RBG VHF omni-directional radio-range/distance measuring equipment (VOR/DME) navigational aid (NAVAID) and the position of RBG under Victor airways that link California, Oregon, and Washington. Victor airways are routes pilots can navigate on using NAVAIDs and create commonly used traffic routes. RBG's location under the Victor airways makes it an ideal location for pilots traveling to and from California, Oregon, and Washington to stop and refuel. A VOR/DME allows pilots to determine their position and helps them navigate to their destination using a radio beacon. The RBG VOR/DME helps maintain itinerant GA operations due to the equipment's location between Eugene and Medford. The VOR/DME helps aircraft bound for RBG navigate to the Airport.

Local General Aviation Operations

Local GA operations originate and terminate at the same airport and are generally performed by pilots (both student and licensed) that are practicing landings. Local operations can vary greatly based on to the level of flight training at an airport, and how active the resident GA community is. Local operations include touch-and-go landings, as defined earlier in this chapter, which count as two operations. Local GA operations at RBG and nationally are shown in **Table 2-10**.

Table 2-10: Local GA Operations

Year	RBG Local Operations	% Change	National Local Operations	% Change
2006	1,960	N/A	14,365,000	N/A
2007	1,960	0.0%	14,556,771	1.3%
2008	11,660	494.9%	14,081,157	-3.3%
2009	11,660	0.0%	12,447,957	-11.6%
2010	11,660	0.0%	11,716,274	-5.9%
2011	11,660	0.0%	11,437,028	-2.4%
2012	11,660	0.0%	11,608,306	1.5%
2013	11,660	0.0%	11,688,301	0.7%
2014	11,660	0.0%	11,675,040	-0.1%
2015	11,660	0.0%	11,691,338	0.1%
2016	11,660	0.0%	11,632,078	-0.5%
CAGR	19.5%	N/A	-2.1%	N/A

CAGR: Compound Annual Growth Rate

Source: FAA Terminal Area Forecast, FAA Aerospace Forecast

The gain of 9,700 operations (494.9 percent) from 2007 to 2008 represents a readjustment in the TAF estimate of local GA operations at RBG. While the economic recession brought about a decline in national operations from 2008 to 2011, the adjusted TAF estimate in 2008 resulted in an increase in operations for RBG. Nationally, local GA operations fell by approximately 500 thousand operations (-3.3 percent) in 2008 and declined further in 2009 by approximately 1.6 million operations (-11.6 percent). There has been no change in the TAF estimate for local GA operations at RBG since 2008. The CAGR for RBG local operations is 19.5 percent but is misleading due to the jump in estimated operations in 2008. Nationally, local GA operations have remained essentially flat since 2010.

RBG has several factors that help to retain and grow local operations: recreational pilots on the airport, no control tower, and the number of based aircraft on the field. Recreational pilots routinely practice touch-and-go operations to accumulate flight hours. RBG is a non-towered airport that provides an uncongested airspace for pilots to perform pattern work and touch-and-go operations. As of 2017, RBG has 108 based aircraft, which includes 86 single-engine piston (SEP) aircraft, nine multi-engine piston (MEP) aircraft, nine jets, and four helicopters. Local operations generally consist of helicopter and SEP aircraft. This means there is a strong presence of local pilots that base their aircraft at RBG and conduct local operations from the Airport.

Based Aircraft Terminology

Single-Engine Piston (SEP)

SEP have one piston-powered engine. These aircraft are generally smaller and often used for flight training and recreational flying, but may be used for regional business trips. Depending on weight and operator certification, these aircraft generally require only one pilot.

Multi-Engine Piston (MEP)

MEP have two or more engines and are typically larger than SEP. Multiple engines make the aircraft more capable and require additional flight instruction beyond what is needed to operate an SEP. MEP are primarily used for flight training and business aviation. MEP may require two pilots, but many variants can be operated with one.

Jet

Jet aircraft have a turbine engine instead of a piston engine. These aircraft may have turbojets, or a turboprop. Jet aircraft range in size from small, four-passenger business jets to the largest airliners. They can generally fly faster and at higher altitudes than SEP and MEP, making them better suited for business travel and emergency response. It is less common, but not unheard of, to see a jet used for recreational flying and flight instruction. Some smaller civilian jets can operate with a single pilot; however, most civilian jet aircraft require two.

Helicopter

Helicopters have a rotor mounted above the cabin for lift and propulsion. Helicopters are commonly used for flight training, by law enforcement and emergency response, and by aerial businesses, such as pipeline inspection, forestry, and aerial agriculture. Helicopters can be piston- or turbine-powered, and depending on the complexity of the model, can be operated by one pilot or two.

Other

This category includes experimental, sport, glider, and ultralight aircraft. These aircraft are used for recreational flying.

- Experimental aircraft refer to kit airplanes built by users or third-parties other than the original manufacturer. Experimental aircraft share many characteristics with SEP – the key differentiator is how and where the aircraft is assembled.
- Sport aircraft 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.
- Gliders are unpowered aircraft that are towed into flight and use thermal uplift to sustain altitude.
- 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.

Based aircraft are those that use a hangar and are stored at RBG. Based aircraft do not include visiting itinerant aircraft. The FAA breaks down based aircraft into distinct categories based on an aircraft's propulsion system, engine configuration, and weight. As mentioned previously, based on 2017 counts, there are 86 SEP aircraft at RBG. This makes up 79.6 percent of the total based fleet. Additionally, there are nine jets, nine MEP aircraft, and four helicopters. There are no "Other" aircraft based at RBG. **Table 2-11** shows based aircraft records from 2006 to 2016.

Table 2-11: Based Aircraft Fleet

Year	SEP	MEP	Jet	Heli.	Other	Total	Change
2006	82	6	4	4	0	96	N/A
2007	82	6	4	4	0	96	0%
2008	79	10	2	3	0	94	-2%
2009	106	10	2	3	0	121	29%
2010	102	9	2	3	0	116	-4%
2011	82	7	3	2	0	94	-19%
2012	82	7	3	2	0	94	0%
2013	84	6	2	3	0	95	1%
2014	81	6	2	3	0	92	-3%
2015	78	8	9	3	0	98	7%
2016	78	8	9	3	0	98	0%
2017	86	9	9	4	0	108	10.2%
CAGR 06-17	-0.5%	4.1%	7.2%	-2.8%	0.0%	0.2%	N/A

Note: 2017 and 2016 data provided by City of Roseburg. 2006 – 2015 data is from TAF.

CAGR: Compound Annual Growth Rate

Source: FAA Terminal Area Forecast and Airport records

Based aircraft totals at RBG have been fluctuating since 2006. The number of based aircraft peaked at 121 in 2010 and hit a low of 92 in 2015. Factors contributing to declining numbers include the recession, rising oil prices, growing costs associated with earning a private pilot's license, and growing cost of aircraft ownership. Historical data in the 2017 FAA Aerospace Forecast show that SEP and MEP aircraft have been retired and have not been replaced, with the combined fleet declining by 1.7 percent a year from 2010 to 2016. The national turbine fleet has grown by 1.3 percent per year, and the helicopter fleet has grown by 1 percent per year during this time.

2.4.3 MILITARY

There are no based military aircraft at RBG. The TAF indicates that there are no local military operations in the previous ten years or in the forecast, and that a total of 50 itinerant military operations occurred annually starting in 2008 and will continue with no change through 2040. Unlike other aspects of aviation, military activity is driven by the needs of the U.S. Department of Defense and does not fluctuate in line with market forces. The Department of Defense does not provide projections of future activity or airport use; therefore, military activity is not forecasted to grow or decline like other variables in the forecast. For planning purposes, military activity is considered to remain constant throughout the forecast period.

2.4.4 ITINERANT AIR TAXI OPERATIONS

Itinerant taxi operations are aircraft with less than 60 seats that operate under Title 14 of the Code of Federal Regulations Part 91 (14 CFR 91), which pertains to GA, and 14 CFR 135, which pertains to on-demand air taxis (not airlines). Passengers who use air taxi operations under 14 CFR 91 and 135 are not counted towards enplanements for an airport, and the operators of these flights do not file passenger information with the U.S. Department of Transportation. There are no enplanements at the Airport.

The FAA TAF indicates that itinerant air taxi operations have been rising at a CAGR rate of 29 percent since 2006. This increase is opposite of the national trend, which has declined at an average of 3.7 percent per from 2006 to 2016. Itinerant air taxi operations are shown in **Table 2-12**.

Table 2-12: Itinerant Air Taxi Operations

Year	RBG	% Change	National	% Change
2006	200	N/A	14,814,402	N/A
2007	200	0%	14,557,699	-2%
2008	2,550	1,175%	13,810,809	-5%
2009	2,550	0%	12,274,775	-11%
2010	2,550	0%	12,132,948	-1%
2011	2,550	0%	11,924,606	-2%
2012	2,550	0%	11,678,854	-2%
2013	2,550	0%	11,482,054	-2%
2014	2,550	0%	11,045,862	-4%
2015	2,550	0%	10,506,227	-5%
2016	2,550	0%	10,183,394	-3%
CAGR	29.0%	N/A	-3.7%	N/A

CAGR: Compound Annual Growth Rate

Source: FAA Terminal Area Forecast

The gain of approximately 2,350 operations (1,175 percent) from 2007 to 2008 represents a readjustment in the TAF estimate of itinerant air taxi operations at RBG. The economic recession in 2008 brought about a decline in national operations from 2008 to 2011. National itinerant air taxi operations fell by approximately 700,000 operations (-5 percent) in 2008 and declined further in 2009 by approximately 1.6 million operations (-11 percent). The TAF shows no change in itinerant air taxi operations at RBG between 2008 and 2016. The CAGR for RBG itinerant air taxi operations is misleading due to the jump in estimated operations in 2008. Nationally, itinerant air taxi operations declined after the recession and continue to decline. While not reflected in the TAF, RBG has seen a decline in itinerant air taxi operations due to the absence of the nighttime circling instrument approach procedure.

2.5 GENERAL AVIATION FORECASTS

GA forecasts consider itinerant and local operations and based aircraft. GA covers the aspects of terrestrial flight that are not commercial or military, such as recreational flying, business aviation, flight instruction, and emergency services.

2.5.1 ITINERANT GENERAL AVIATION OPERATIONS

Methods

Itinerant GA forecasts employ FAA Aerospace Forecast growth rates, a state market share analysis, a national market share analysis, a correlation analysis, and a trendline analysis. Each method was considered; however, some were dropped due to the lack of accurate historical data.

FAA Aerospace Forecast Analysis takes the national growth rate of itinerant GA operations to project future activity. The FAA Aerospace Forecast helps guide local forecasts by serving as a point of comparison between local trends and national trends. A forecast was developed using FAA Aerospace Forecast growth rates for itinerant GA operations because the FAA Aerospace Forecast projects growth in iterant GA operations, and itinerant GA operations have been increasing over the past ten years.

State Market Share Analysis takes the percent of state itinerant operations that have occurred at RBG over the past five years, and forecasts that future itinerant operations will maintain this ratio into the future. RBG has historically averaged 2.4 percent of Oregon's itinerant operations since 2011. Itinerant GA operations are forecast to maintain this ratio. FlightAware data indicates that 93.9 percent of itinerant GA operations from 2008 to 2016 originate in Oregon, meaning that itinerant GA operations at RBG should grow proportionally with itinerant GA operations for the state.

National Market Share Analysis takes the percent of national itinerant operations that have occurred at RBG over the past five years, and forecasts that future itinerant operations will maintain this ratio into the future. RBG has historically averaged 0.05 percent of national itinerant GA operations since 2011. National fluctuations in GA activity are expected to have less to do with itinerant operations at RBG than fluctuations at the state level due to the high level of itinerant operations that come from within the state.

Correlation Analysis determines if itinerant GA operations show a relationship with other variables that can be used to forecast future operations. Variables that exhibit correlation may have a relationship where growth of one variable (for example, household income) may cause the growth of another (such as purchases of consumer goods). Correlation is rated on a scale between negative one (strong negative correlation) and positive one (strong positive correlation), and expressed as "*r*". A score of close to positive or negative one suggests that two variables may be related, and a score of close to zero suggests that there may be no relation between the variables. Correlation does not necessarily indicate that a change by one variable causes the change in another; therefore, professional judgement and interpretation are necessary to illustrate how the linkage may work in the real world.

Itinerant GA operations show strong positive correlation with national itinerant GA operations ($r = 0.83$) and national local GA operations ($r = 0.80$), and strong negative correlation with MSA employment ($r = -0.81$) and MSA population ($r = -0.77$). TAF estimates for the previous ten years of itinerant operations for RBG have a large drop in operations from 2007 to 2008 and remain flat between 2008 and 2015, making the data unreliable. As a result, correlation analysis was not used to develop forecasts for itinerant GA operations, because inputs must be accurate, otherwise the outputs are not defensible.

Trendline Analysis takes the previous ten years of itinerant GA operations data and projects it into the future. TAF estimates for the previous ten years of itinerant operations for RBG have a large drop in operations from 2007 to 2008 and remain flat from 2008 to 2015, making the data unreliable. Therefore, a trendline forecast was not developed for itinerant GA operations.

Preferred and TAF Comparison

The preferred itinerant GA operations forecast is the State Market Share Forecast. This method produces growth of itinerant GA operations with a CAGR of 1.3 percent. The TAF indicates that Oregon itinerant GA operations will continue to grow over the next twenty years, meaning that itinerant GA operations at RBG will grow at the same proportional rate as the previous five years. Itinerant GA operation forecasts are shown in **Table 2-13** and **Figure 2-2**. **Table 2-14** shows that the preferred forecast is within ten percent of the TAF at the five-year reporting period, and within fifteen percent of the TAF at the ten-year reporting period.

Table 2-13: Itinerant Operations Forecast

Year	Aerospace	State Share	National Share	TAF
2016	17,609	17,609	17,609	17,609
2021	17,800	18,900	17,500	18,218
2026	18,100	20,100	17,800	18,850
2031	18,300	21,400	18,200	19,503
2036	18,600	22,900	18,500	20,178
CAGR	0.3%	1.3%	0.2%	0.7%

CAGR: Compound Annual Growth Rate

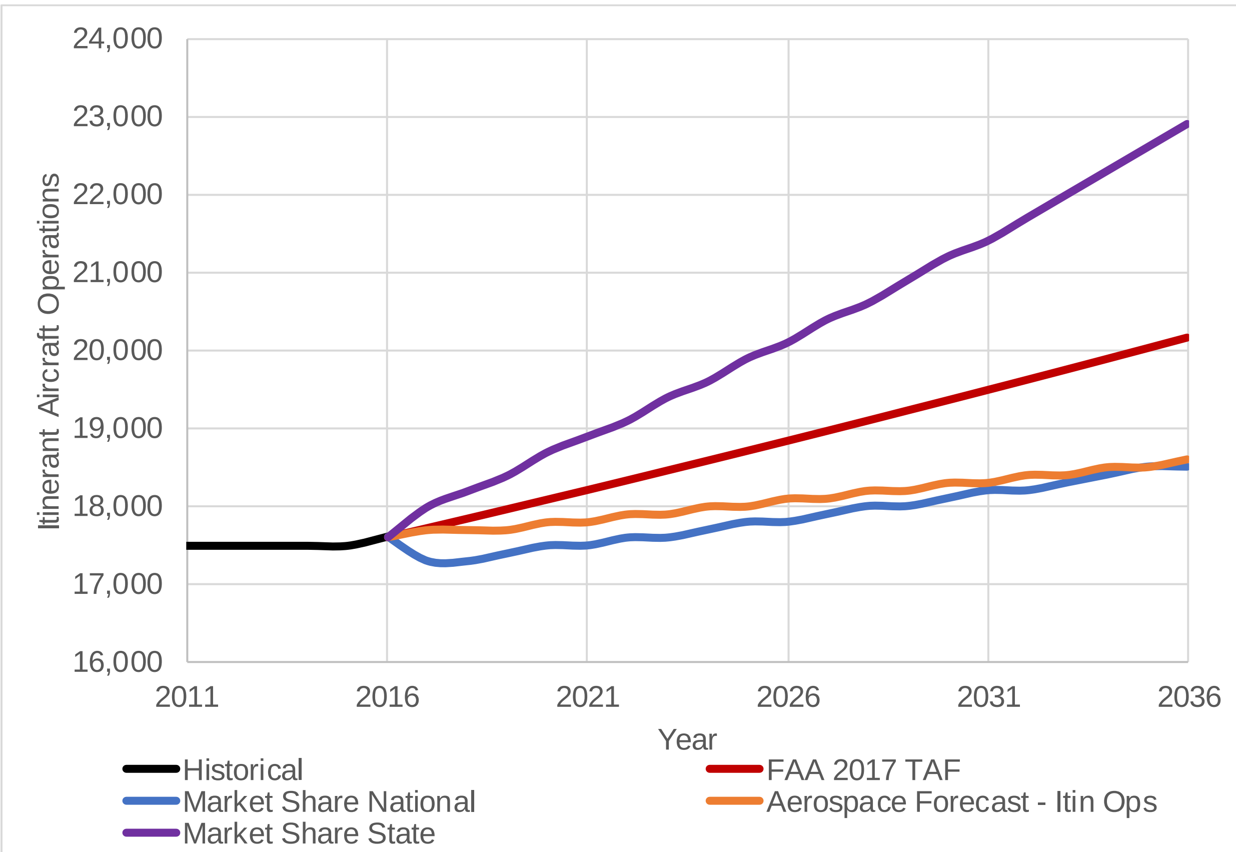


Figure 2-2: Itinerant Operations Forecast

Table 2-14: Preferred Itinerant Operations Forecast – TAF Comparison

Year	TAF	Forecast	Difference	
2016	17,609	17,609	0	0.0%
2021	18,218	18,900	682	3.7%
2026	18,850	20,100	1250	6.6%
2031	19,503	21,400	1897	9.7%
2036	20,178	22,900	2722	13.5%
CAGR	0.7%	1.3%	N/A	N/A

CAGR: Compound Annual Growth Rate

Source: FAA Terminal Area Forecast

2.5.2 LOCAL OPERATIONS FORECAST

Methods

Local GA forecasts employ correlation analysis, FAA Aerospace Forecast analysis, state market share analysis, national market share analysis, and trend analysis. While each method was considered, some were dropped due to the lack of accurate historical data.

Correlation Analysis determines if local GA operations show a relationship with local variables that can be used to forecast future operations. Local GA operations show strong positive correlation with MSA population (r = 0.79) and MSA employment (r = 0.82). TAF estimates for the previous ten years of local operations for RBG have a spike in operations from 2007 to 2008 (approximately 9,700 more operations) and remain flat between 2008 and 2016. TAF estimates normally are unreliable when historic local GA operations do not change year over year, but there is a trend in growth for both local operations and MSA population. Woods & Poole data indicates that MSA population had a CAGR of 0.2 percent from 2006 to 2016. The TAF estimates for local GA operations suggest that the estimate readjustment was necessary due to local GA operations increasing, albeit slowly after 2008. A forecast was developed using the MSA population grow rate for local GA operations due to historic local GA operations and MSA population sharing a low growth rate.

FAA Aerospace Forecast Analysis takes the national growth rate of local GA activity to project future activity. The FAA Aerospace Forecast helps guide local forecasts by serving as a point of comparison between local and national trends. A forecast was developed using Aerospace Forecast growth rates for local GA operations because the Aerospace Forecast projects growth in local GA operations, and local GA operations have been increasing over the past ten years.

State Market Share Analysis takes the percent of state local operations that have occurred at RBG over the past five years, and forecasts that future local operations will maintain this ratio into the future. RBG has historically averaged 1.9 percent of local GA operations in Oregon. Forecasts were developed using state market share analysis because of the historic percentage of local GA operations at RBG maintaining the same ratio over five years.

National Market Share Analysis takes the percent of national local operations that have occurred at RBG over the past five years, and forecasts that future local operations will maintain this ratio into the future. RBG has historically averaged 0.03 percent of national local GA operations since 2011. Forecasts were developed using national market share analysis because of the historic percentage of local GA operations at RBG maintaining the same ratio over five years.

Trendline Analysis takes the previous ten years of local GA operations data and projects it into the future. TAF estimates for the previous ten years of local GA operations for RBG have a large increase in operations from 2007 to 2008 and remain flat from 2008 to 2016, making the data unreliable. Therefore, a trendline forecast was not developed for local GA operations.

Preferred and TAF Comparison

As stated in the FAA document *Forecast Process for the 2016 TAF,* GA operations are assessed based on past trends. The TAF for RBG is likely repeating because the growth rate in local operations is low and the limited amount of data on operations keeps the forecast of local operations in the TAF the same.

The preferred local operations forecast is the one based on MSA population. As the population in the MSA increases, the potential for GA pilots to live in the area increases. Between 2006 and 2016, the Douglas County MSA has a CAGR of 0.2 percent, meaning the population was increasing steadily. In 2008, the TAF readjustment for local GA operations occurred, meaning that local operations were steadily increasing as well, but not fast enough to warrant a change in the amount of operations published in the TAF each year. Given the historic pattern between MSA population and local GA operations, and how MSA population is forecasted to continue growing over the next twenty years, local GA operations are forecasted to grow at the same rate. Local operations forecasts are shown in **Table 2-15** and **Figure 2-3**. **Table 2-16** shows that the preferred forecast is within ten percent of the TAF at the five-year reporting period, and within fifteen percent of the TAF at the ten-year reporting period.

Table 2-15: Local Operations Forecast

Year	Aerospace	State Share	National Share	MSA Pop	TAF
2016	11,660	11,660	11,660	11,660	11,660
2021	11,900	12,700	11,900	11,900	11,660
2026	12,100	13,300	12,100	12,200	11,660
2031	12,300	14,000	12,300	12,500	11,660
2036	12,500	14,700	12,600	12,700	11,660
CAGR	0.3%	1.2%	0.4%	0.4%	0.0%

CAGR: Compound Annual Growth Rate

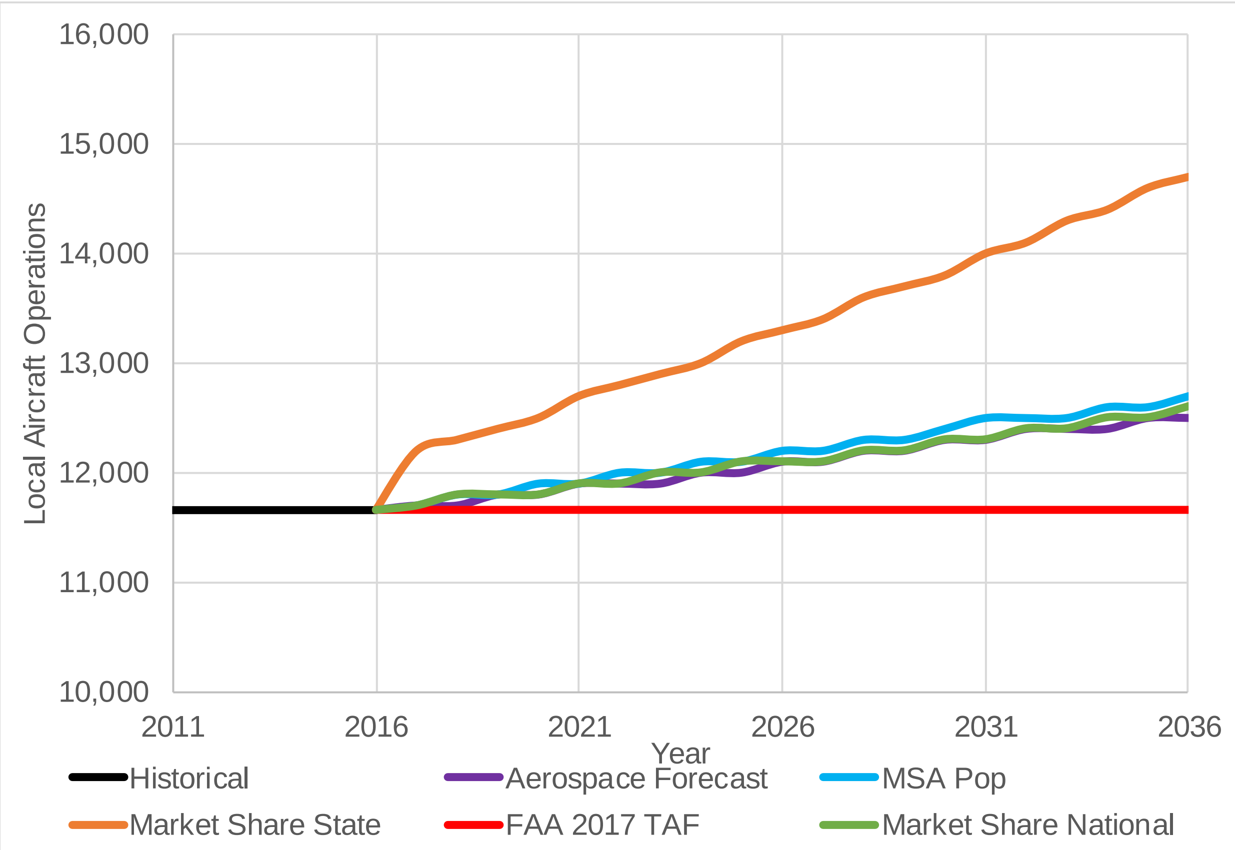


Figure 2-3: Local Operations Forecast

Table 2-16: Preferred Local Operations Forecast – TAF Comparison

Year	TAF	Forecast	Difference	
2016	11,660	11,660	0	0.0%
2021	11,660	11,900	240	2.1%
2026	11,660	12,200	540	4.6%
2031	11,660	12,500	840	7.2%
2036	11,660	12,700	1040	8.9%
CAGR	0.0%	0.4%	N/A	N/A

CAGR: Compound Annual Growth Rate

Source: FAA Terminal Area Forecast

2.5.3 BASED AIRCRAFT

Based aircraft are those stored at RBG, either in hangars or tie-downs. Based aircraft forecasts are primarily used to define aircraft parking and storage needs.

Additional information obtained on February 14, 2018 provided validated based aircraft counts for 2017. As such, the based aircraft forecast has been updated to include 2017 data and uses 2017 as the base year for calculations. Using the latest validated counts will help provide a more accurate forecast that reflects the most recent conditions.

Methods

Based aircraft forecasts employ FAA Aerospace Forecast analysis, ten-year historic based aircraft growth rate analysis, correlation analysis, trendline analysis, and a hybrid forecast using the Aerospace Forecast and the ten-year historic based aircraft growth rate analysis.

FAA Aerospace Forecast Analysis takes the national growth rate of based aircraft based on type (SEP, MEP, Jet, Helicopter, Other) to project future based aircraft. The Aerospace Forecast helps guide local forecasts by serving as a point of comparison between local and national trends. A forecast was developed using this methodology.

Ten-Year Historic Based Aircraft Growth Rate Analysis takes the ten-year growth rate for historic based aircraft at RBG from the TAF and applies the growth rate to all aircraft. Based aircraft increased by 0.2 percent annually over the previous ten years for a gain of two aircraft (96 total aircraft in 2006, 98 total aircraft in 2016). The growth rate was applied to all aircraft types to forecast future total based aircraft. Based aircraft totals were within ten percent of the TAF in five years and fifteen percent in ten years. A forecast was developed using this methodology.

Correlation Analysis determines if based aircraft show a relationship with local variables that can be used to forest future based aircraft. Local GA operations show strong positive correlation with national commuting passengers (r = 0.76) and total pilots (r = 0.76). The national commuting passenger's correlation is a false positive, and cannot be used to show a relationship with based aircraft because commuting passengers are associated with commercial operations. TAF estimates for the previous ten years of based aircraft for RBG have a spike in based aircraft from 2009 to 2010 (increase of 27) and a sharp decline from 2011 to 2012 (loss of 22). Estimates of based aircraft remain essentially flat outside of 2009 to 2012. The flat and spiking estimates of based aircraft make the data unreliable. Therefore, forecasts were not developed for based aircraft.

Trendline Analysis takes the previous ten years of based aircraft data and projects it into the future. The flat and spiking estimates of based aircraft make the data unreliable. Therefore, a trendline forecast was not developed for based aircraft.

Hybrid Analysis takes the percent of the national growth rate of based aircraft based on type and the historic ten-year growth rate for historic based aircraft at RBG from the TAF. The hybrid analysis was created to take into effect national and historic trends. The Aerospace Forecast forecasts growth in jets, helicopters and Other aircraft, and a decline in MEP. Growth rates from the Aerospace Forecast were used in the hybrid to represent the national trends of these aircraft. The ten-year historic growth rate of based aircraft indicates an increase in based aircraft at RBG. The ten-year historic growth rate was used to forecast SEP aircraft. A forecast was developed using this methodology so national and local trends could both be incorporated into the forecast.

Preferred Based Aircraft Forecast and TAF Comparison

The TAF forecasts based aircraft to increase to 98 aircraft in 2027 and remain at 98 based aircraft through 2037 for a CAGR of 0.2 percent.

The preferred based aircraft forecast is the hybrid forecast using both the Aerospace Forecast and ten-year historic based aircraft growth rate analysis. The hybrid forecast was selected for the following reasons:

- The Aerospace Forecast provided national growth rates for jets, MEP, helicopters, and Other aircraft.
- The previous ten years of based aircraft data shows an increase in total based aircraft, resulting in a CAGR of 0.2 percent. This rate was used to forecast SEP aircraft because it represents a historic local trend of based aircraft at RBG.
- SEP aircraft make up 79.6 percent of total based aircraft at RBG in 2016. If the Aerospace Forecast growth rate of -0.9 percent was used instead of 0.2 percent, the decline in future based aircraft would not represent the local trends for SEP at RBG.

Based aircraft forecasts are shown in **Table 2-17** and **Figure 2-4**. The preferred based aircraft forecast is shown in **Table 2-18**. **Table 2-19** shows that the preferred forecast is within ten percent of the TAF at the five-year reporting period, and within fifteen percent of the TAF at the ten-year reporting period.

Table 2-17: Based Aircraft Forecast

Year	Aerospace	10 Year Historic	Hybrid	TAF
2017	108	108	108	94
2022	105	109	110	96
2027	102	112	113	98
2032	100	114	114	98
2037	98	117	116	98
CAGR	-0.5%	0.4%	0.4%	0.2%

CAGR: Compound Annual Growth

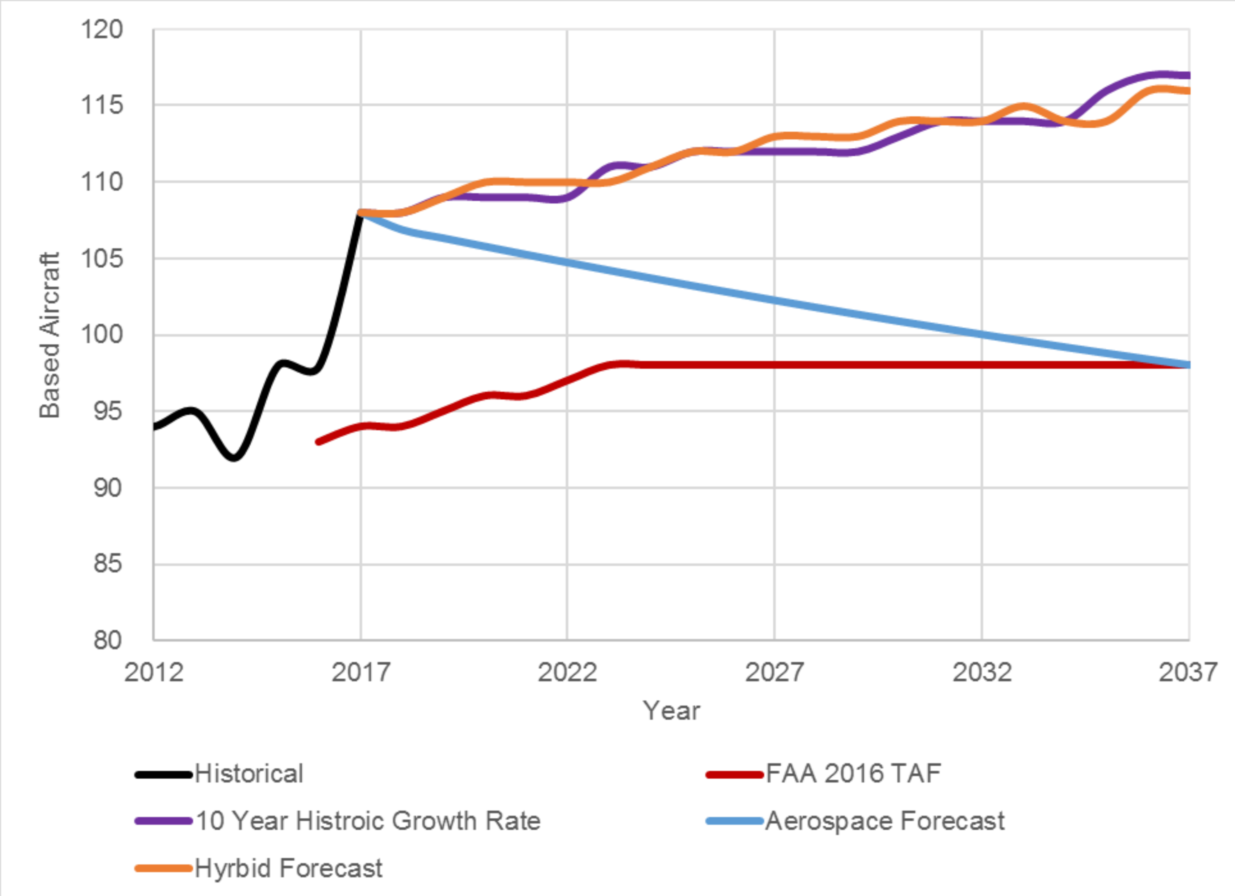


Figure 2-4: Based Aircraft Forecast

Table 2-18: Preferred Based Aircraft Forecast – Aircraft Types

Year	SEP	MEP	Jet	Helicopter	Other	Total
2017	86	9	9	4	0	108
2022	87	9	10	4	0	110
2027	88	9	11	5	0	113
2032	89	9	11	5	0	114
2037	90	8	12	6	0	116
CAGR	0.2%	-0.6%	1.4%	2.0%	N/A	0.4%

CAGR: Compound Annual Growth

SEP: Single Engine Piston

MEP: Multi Engine Piston

Table 2-19: Preferred Based Aircraft Forecast – TAF Comparison

Year	TAF	Forecast	Difference	
2017	108	94	-14	-13.0%
2022	110	97	-13	-11.8%
2027	113	98	-15	-13.3%
2032	114	98	-16	-14.0%
2037	116	98	-18	-15.5%
CAGR	0.4%	0.2%	N/A	N/A

CAGR: Compound Annual Growth Rate

Source: FAA Terminal Area Forecast

While the difference between the TAF and Forecast is greater than 10% as shown in **Table 2-19**, it should be noted that the TAF uses 2016 as a base year. When the TAF is updated with 2017 numbers, the Forecasted numbers are expected to be well within 10% of the TAF.

2.5.5 ITINERANT AIR TAXI OPERATIONS

Itinerant air taxi operations are those that begin and end flights at different airports. Itinerant air taxi operations are conducted by small or large private jets.

Methods

Itinerant air taxi operation forecasts employ correlation analysis, FAA Aerospace Forecast analysis, state market share analysis, national market share analysis, and trendline analysis.

Correlation Analysis determines if itinerant air taxi operations show a relationship with local variables that can be used to forecast future itinerant air taxi operations. Itinerant air taxi operations show strong positive correlation with MSA population (r = 0.79), MSA employment (r = 0.82), and MSA GRP (r = 0.59). TAF estimates for the previous ten years of itinerant air taxi operations for RBG have a spike in operations from 2007 to 2008 (approximately 2,350 more operations) and remain flat between 2008 and 2016. TAF estimates normally are unreliable when historic itinerant air taxi operations remain the same estimate, but there is a similar trend in growth for itinerant air taxi operations, MSA population, MSA employment, and MSA GRP. Woods & Poole data indicates that from 2006 to 2016, MSA population had a CAGR of 0.2 percent, MSA employment has a CAGR of 5.9 percent, and MSA GRP has a CAGR of 1.2 percent. The TAF estimates for itinerant air taxi operations suggests that the estimate readjustment was necessary due to itinerant air taxi operations increasing, albeit slowly after 2008. Forecasts were developed using MSA population, MSA employment, and MSA GRP growth rates for itinerant air taxi operations due to historic itinerant air taxi operations and the local variables sharing a slow growth rate.

FAA Aerospace Forecast Analysis takes the national growth rate of itinerant air taxi operations to project future itinerant air taxi operations. The Aerospace Forecast helps guide local forecasts by serving as a point of comparison between local trends and national trends. The Aerospace Forecast indicates a decline in itinerant air taxi operations by 3.5 percent over the past ten years and a decline of 0.9 percent annually over the next twenty. TAF estimates from 2006 to 2016 indicate that itinerant air taxi operations have been increasing, albeit at a slow rate that did not warrant an adjustment in the operations estimate since 2008. A forecast was not developed using the Aerospace Forecast because itinerant air taxi operations have been declining nationally but have been increasing locally.

State Market Share Analysis takes the percent of state itinerant air taxi operations that have occurred at RBG over the past five years, and forecasts that future itinerant air taxi operations will maintain this ratio into the future. RBG has historically averaged 2.0 percent of itinerant air taxi operations in Oregon since 2011. A state market share forecast was developed but not used because the forecast was greater than ten percent of the TAF at the five-year reporting period, and greater than fifteen percent of the TAF at the ten-year reporting period.

National Market Share Analysis takes the percent of national itinerant air taxi operations that have occurred at RBG over the past five years, and forecasts that future itinerant air taxi operations will maintain this ratio into the future. RBG has historically averaged 0.02 percent of national itinerant air taxi operations since 2011. National fluctuations in GA activity are expected to have less to do with itinerant operations at RBG than fluctuations at the state level due to the high level of itinerant operations that come from within the state. A national market share forecast was developed but not used because the forecast was greater than ten percent of the TAF at the five-year reporting period, and greater than fifteen percent of the TAF at the ten-year reporting period.

Trendline Analysis takes the previous ten years of itinerant air taxi operations data and projects it into the future. TAF estimates for the previous ten years of itinerant air taxi operations for RBG have a large increase in operations from 2007 to 2008 and remain flat from 2008 to 2016, making the data unreliable. Therefore, a trendline forecast was not developed for itinerant air taxi operations.’

Preferred Itinerant Air Taxi Operations and TAF Comparison

The TAF is likely repeating no growth because the growth rate for itinerant air taxi operations is low and the limited amount of data on operations keeps the forecast of itinerant air taxi operations in the TAF the same.

The preferred itinerant air taxi forecast is the one based on MSA employment. The TAF estimates itinerant air taxi operations for RBG, which have remained flat since 2008 and are forecasted to remain flat until 2036. Since the TAF estimate has not been readjusted since 2008, itinerant air taxi operation counts may not reflect actual activity. The City of Roseburg is experiencing an increase in the amount of people employed in high value industries like health care. Total employment in health care is expected to increase by approximately 2,200 by 2036. High value industries are primary customers of charter flights. As employment increases, the potential for itinerant air taxi operations increases. Itinerant air taxi operations forecasts are shown in **Table 2-20** and **Figure 2-5**. **Table 2-21** shows that the preferred forecast is within ten percent of the TAF at the five-year reporting period, and within fifteen percent of the TAF at the ten-year reporting period.

Table 2-20: Itinerant Air Taxi Operations Forecast

Year	MSA Population	MSA Employment	GRP	TAF
2016	2,550	2,550	2,580	2,550
2021	2,600	2,500	2,702	2,550
2026	2,700	2,600	2,845	2,550
2031	2,700	2,700	2,980	2,550
2036	2,800	2,700	3,095	2,550
CAGR	0.5%	0.3%	0.9%	0.0%

CAGR: Compound Annual Growth

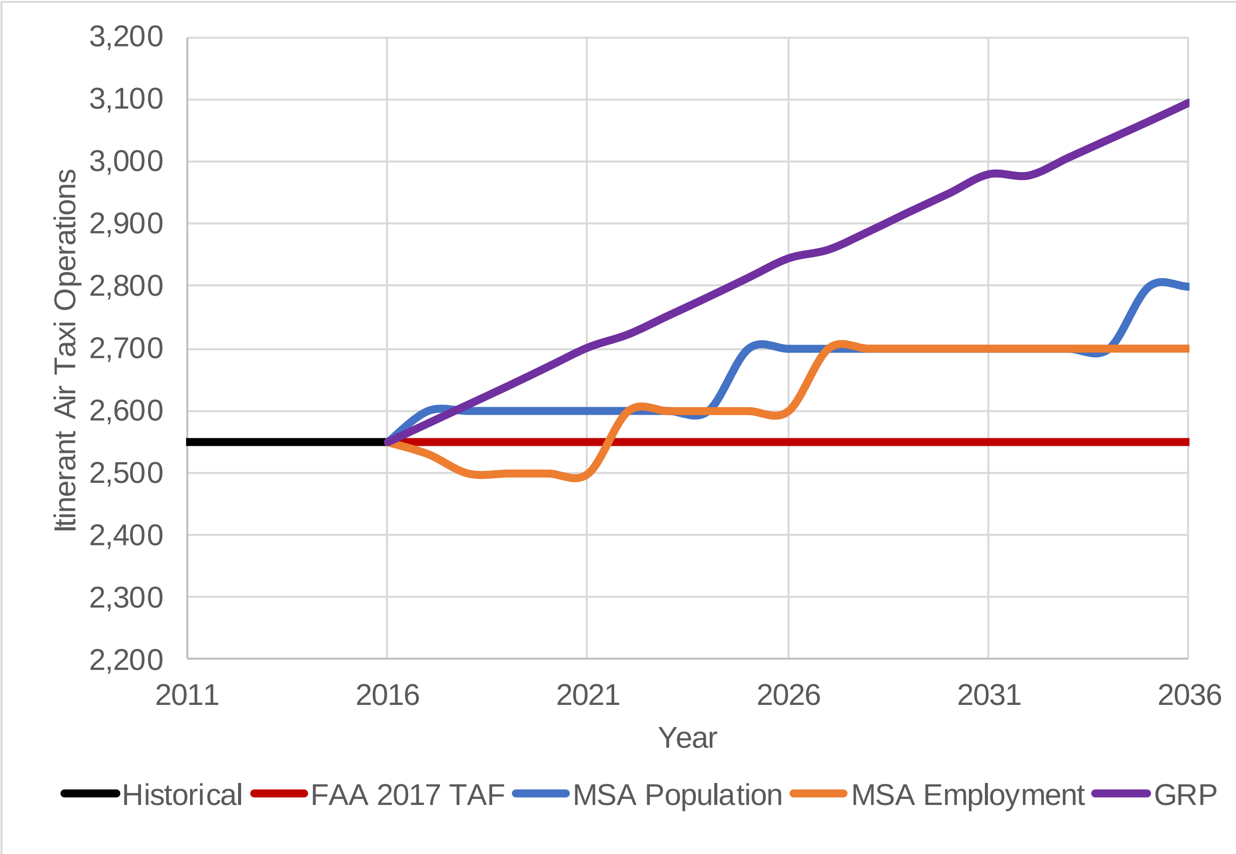


Figure 2-5: Itinerant Air Taxi Operations Forecast

Table 2-21: Preferred Itinerant Air Taxi Operations Forecast – TAF Comparison

Year	TAF	Forecast	Difference	
2016	2,550	2,550	0	0.0%
2021	2,550	2,500	-50	-2.0%
2026	2,550	2,600	50	2.0%
2031	2,550	2,700	150	5.9%
2036	2,550	2,700	150	5.9%
CAGR	0.0%	0.3%	N/A	N/A

CAGR: Compound Annual Growth Rate

Source: FAA Terminal Area Forecast

2.6 CRITICAL AIRCRAFT

The critical aircraft is the most demanding type, or group of aircraft with similar characteristics, to operate more than 500 times per year at an airport. Aircraft are categorized by airport reference code (ARC), which is made up of the aircraft approach category (AAC) and airplane design group (ADG), as defined in Terminology in Section 2.2 of this chapter. The critical aircraft will be used to design and scale improvement projects and setbacks in **Chapter 3, Facility Requirements** and **Chapter 4, Improvement Alternatives**.

Two data sources, the TFMSC and FlightAware, provide a sample size of aircraft operations at the Airport, but not the total operations. Both data sources only capture operations by aircraft that file flight plans under Instrument Flight Rules (IFR). Operations occurring under Visual Flight Rules (VFR) are not captured. Therefore, aircraft with no flight plans will be missing from the sample data. Due to the absence of an airport traffic control tower, the number of total operations at the Airport are considered estimates.

The TFMSC and FlightAware data vary slightly for reporting aircraft operations due to limitations in radar coverage and incomplete messaging. In order to estimate a base sample of operations by type of aircraft at the Airport the largest monthly operation counts by ARC between the TFMSC and FlightAware data were selected. **Table 2-22** lists a breakdown of operations by ARC in the sample data for RBG from 2011 to 2016.

In order to determine the total number of operations by ARC at the Airport, the sample data of operations in **Table 2-22** was extrapolated at the same operations percentage to the estimated total operations that occur at the Airport. **Table 2-23** lists a breakdown of operations by ARC for the total operations at RBG from 2016 to 2036.

Table 2-22: ARC Operations Sample Data (TFMSC and FlightAware)

Year	A-I	A-II	A-III	B-I	B-II	B-III	C-I	C-II	C-III	D[1]	Sample Operations
2011	2,748	754	-	235	538	2	12	14	3	-	4,306
2012	2,317	716	2	345	536	-	14	14	-	10	3,954
2013	2,318	715	-	447	902	-	4	14	-	8	4,408
2014	2,012	754	-	280	590	2	34	19	2	8	3,701
2015	1,635	830	-	424	455	-	22	24	-	-	3,390
2016	1,197	844	2	440	507	1	22	18	2	2	3,035

1: Column D includes D-I, D-III, and D-V due to the limited number of operations

Notes: ARC counts were determined by selecting the max monthly operations from the TFMSC and FlightAware. ARC Data was corrected using the FAA Aircraft Characteristics Database *(January 2018)*

Sources: TFMSC, FlightAware

Table 2-23: Forecasted Annual ARC Operations

Year	A-I	A-II	A-III	B-I	B-II	B-III	C-I	C-II	C-III	D[1]	Total Operations
2016	17,095	6,450	6	3,035	4,933	7	151	144	10	39	31,869
2021	17,889	6,749	6	3,176	5,162	7	158	151	10	41	33,350
2026	18,748	7,073	6	3,329	5,409	8	166	158	11	43	34,950
2031	19,660	7,417	6	3,491	5,673	8	174	166	11	45	36,650
2036	20,571	7,761	7	3,653	5,936	8	182	173	. 12	47	38,350

1: Column D includes D-I, D-III, and D-V due to the limited number of operations

Notes: Operations were calculated by determining the average annual operations of each ARC from the sample data shown in **Table 2-22**, then extrapolating the average sample data to the 2016, and forecasted total number of operations at RBG.

Source: TFMSC, FlightAware

The existing and future ARC for RBG on the Airport Layout Plan (ALP) is B-II. Based on the sample data shown in **Table 2-22,** the most demanding type of aircraft by ARC to exceed 500 annual operations at the Airport is B-II. Therefore, the existing ARC for the Airport will remain B-II. Based on the data shown in **Table 2-23,** the most demanding type of aircraft by ARC forecasted to exceed 500 annual operations at the Airport is B-II. Therefore, the future ARC of RBG will remain B-II.

Due to limited operations data available for RBG there is no single B-II aircraft that exceeds the 500 annual operations requirement, therefore a representative B-II aircraft is selected to be the critical aircraft. **Table 2-24** lists the recent number of operations by individual B-II aircraft available from the sample TFMSC and FlightAware data. Since 2014, the Cessna Excel/XLS has had more operations annually than any other B-II aircraft at RBG. Additionally, the Cessna Excel/XLS is a based aircraft at the Airport. Therefore, the Cessna Excel/XLS is the existing critical aircraft for the Airport. The future critical aircraft is forecasted to remain the Cessna Excel/XLS.

Table 2-24: Sample Data of B-II Operations (2014-2016)

Rank	Aircraft Type	2016	2015	2014	Total Sample Operations
1	Cessna Excel/XLS	206	202	214	622
2	Cessna Citation II/Bravo	52	34	90	176
3	Beechcraft King Air 90 (F/C)	56	50	54	160
4	Beechcraft Super King Air 200	74	32	36	142
5	Gulfstream Commander	0	8	124	132
6	Cessna Citation II/SP	28	22	20	70
7	Dassault Falcon/Mystère 50	18	30	0	48
8	Embraer Phenom 300	6	20	8	34
9	Raytheon 300 Super King Air	18	6	2	26
10	Cessna Citation V/Ultra/Encore	6	6	14	26

Source: TFMSC, FlightAware

2.7 FORECAST SUMMARY

The forecast summary is presented in **Table 2-25** and **Table 2-26**. These are the forecast highlights:

- RBG is the only GA airport in Douglas County to offer both 100LL and Jet A fuels, and has one FBO.
- Single-engine and multi-engine piston aircraft will be retired faster than they are replaced. Jet, turbo-prop, helicopter, and Other aircraft (experimental, gliders, light sport) are growing segments.
- Local and itinerant GA operations will grow, albeit at a slow rate; however, RBG has facilities that will attract pilots.
- The future ARC for RBG will remain B-II and the critical aircraft is the Cessna Excel/XLS.

Table 2-25: Forecast/TAF Comparison

Category	Year	Airport Forecast	TAF	AF/TAF (% Difference)
Passenger Enplanements				
Base Year	2016	0	0	0.0%
Base Year + 5 years	2021	0	0	0.0%
Base Year + 10 years	2026	0	0	0.0%
Base Year + 15 years	2031	0	0	0.0%
Commercial Operations				
Base Year	2016	2,550	2,550	0.0%
Base Year + 5 years	2021	2,500	2,550	-2.0%
Base Year + 10 years	2026	2,600	2,550	2.0%
Base Year + 15 years	2031	2,700	2,550	5.9%
Total Operations				
Base Year	2016	31,869	31,869	0.0%
Base Year + 5 years	2021	33,350	32,478	2.7%
Base Year + 10 years	2026	34,950	33,110	5.6%
Base Year + 15 years	2031	36,650	33,763	8.6%

Notes: TAF data is on a U.S. Government fiscal year basis (October through September).

AF/TAF (% Difference) column has embedded formulas.

Airport Name: Roseburg Regional Airport

Table 2-26: TAF Forecast Worksheet

Category	Forecast Levels 2016	2017	2021	2026	2031	Average Annual Compound Growth Rates 2016	2021	2026	2031
Passenger Enplanements									
Air Carrier	0	0	0	0	0	0	0	0	0
Commuter	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0
Itinerant Operations									
Air Carrier	0	0	0	0	0	0	0	0	0
Com/Air Taxi	2,550	2,500	2,500	2,600	2,700	-2.0%	-0.4%	0.2%	0.4%
Total	2,550	2,500	2,500	2,600	2,700	-2.0%	-0.4%	0.2%	0.4%
GA	17,609	18,000	18,900	20,100	21,400	2.2%	1.4%	1.3%	1.3%
Military	50	50	50	50	50	0.0%	0.0%	0.0%	0.0%
Local Operations									
GA	11,660	11,700	11,900	12,200	12,500	0.3%	0.4%	0.5%	0.5%
Military	0	0	0	0	0	0.0%	0.0%	0.0%	0.0%
Total Ops	31,869	32,250	33,350	34,950	36,650	1.2%	0.9%	0.9%	0.9%
Instrument Ops	6,740	6,784	6,998	7,383	7,791	0.7%	0.8%	0.9%	1.0%
Peak Hour Ops	0	0	0	0	0	0.0%	0.0%	0.0%	0.0%
Cargo/Mail	0	0	0	0	0	0.0%	0.0%	0.0%	0.0%
Based Aircraft									
SEP	78	86	87	88	89	0.0%	2.2%	1.2%	0.9%
MEP	9	9	9	10	10	0.0%	0.0%	0.0%	0.0%
Jet	8	9	9	10	10	0.0%	4.6%	2.3%	2.1%
Helicopter	3	4	4	4	5	0.0%	5.9%	5.2%	3.5%
Other	0	0	0	0	0	0.0%	0.0%	0.0%	0.0%
Total	98	108	109	112	114	0.0%	2.3%	1.3%	1.0%

Category	Operational Factors 2016	2017	2021	2026	2031
Average Aircraft Size (seats)					
Air carrier	0.0	0.0	0.0	0.0	0.0
Commuter	0.0	0.0	0.0	0.0	0.0
Average Enplaning Load Factor					
Air carrier	0.0%	0.0%	0.0%	0.0%	0.0%
Commuter	0.0%	0.0%	0.0%	0.0%	0.0%
GA Ops per BA	299	303	326	0	0

Note: SEP: Single Engine Piston, MEP: Multi Engine Piston, GA: General Aviation, BA: Based Aircraft, Com: Commuter

FACILITY REQUIREMENTS

CH. 3

ROSEBURG REGIONAL AIRPORT
CHAPTER 3: FACILITY REQUIREMENTS

CHAPTER OVERVIEW

The Facility Requirements Chapter documents the recommended airport facilities to address the existing and 20-year aviation forecast demand for the Roseburg Regional Airport (RBG or the Airport). This chapter compares current and forecasted aviation activity levels presented in **Chapter 2, Aviation Forecasts**, Federal Aviation Administration (FAA) policy and guidance, and site inspections, to the Airport's operational capacity, design requirements, and facility needs. Options for meeting the identified facility needs will be analyzed in **Chapter 4, Improvement Alternatives**. Facility requirements are presented in these following sections:

Airside Facility Requirements

- Critical Aircraft
- Airport Design Standards
- Runway Capacity and Utilization
- Runway Alignment
- Runway Length
- Navigational Aids and Procedures
- Airspace
- Pavement Markings, Lighting, Signage
- Taxiway System Analysis

Landside Facility Requirements

- Terminal Area and Support Facilities
- Landside and Other Support Facilities

Airside Facilities:
Facilities that are accessible to aircraft, such as runways and taxiways.

Landside Facilities:
Facilities that support airside facilities, but are not part of the aircraft movement area, such as terminal buildings, hangars, aprons, access roads, and parking facilities.

Support Facilities
Facilities that can be either airside or landside facilities that aid in the operation of the airport.

3.1 AIRSIDE FACILITY REQUIREMENTS

The airside facilities are airfield components: the runway, taxiway, and navigation systems used to support aeronautical operations. The facility requirements analysis involves an assessment of aircraft utilization, airfield capacity, and airfield configuration to accommodate forecast activity. Facility requirements are predicated on FAA design standards that must be met for the Airport to receive FAA funding for improvement projects.

3.1.1 CRITICAL AIRCRAFT

The first step in airside facility planning is to identify the critical aircraft. The critical aircraft is the most demanding aircraft type, or group of aircraft with similar characteristics, that operates at the Airport with more than 500 annual operations. The critical aircraft's wingspan, tail height, approach speed, cockpit to main gear length, aircraft weight, and takeoff and landing distances will be used for facility planning.

The existing and future critical aircraft based on historical operations and projections from **Chapter 2, Aviation Activity Forecasts** is the Cessna Citation XLS. **Figure 3-1** below lists the characteristics of the critical aircraft.

Aircraft Design Characteristics:	
Aircraft Type:	Business Jet (Light/Small)
FAA ARC/TDG:	**B-II; TDG 2**
Approach Speed:	±107 Knots
Wingspan:	56.3'
Length:	52.5'
Tailheight:	17.2'
Maximum Weight:	20,400 Pounds
Seating Configuration:	4 to 8 Passengers
Cockpit to Main Gear (CMG)	21.9'
Wheelbase	21.9'
Main Gear Width (MGW)	15.6'

Figure 3-1: Cessna Citation XLS Characteristics

Critical Aircraft:
This is an aircraft with characteristics that determine how to apply airport design standards for a specific runway, taxiway, taxilane, apron, or other facility. This can be a specific aircraft type or a composite of several aircraft currently using, expected to use, or intended to use the airport or part of the airport. This is also called the "critical design aircraft."

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

Taxiway Design Group (TDG):
A classification of airplanes based on outer to outer Main Gear Width (MGW) and Cockpit to Main Gear distance (CMG).

Runway Visibility Range (RVR):
Instrument approach visibility minimums in feet.

Runway Design Code (RDC):
A code signifying the design standards to which the runway is to be built.

3.1.2 AIRPORT DESIGN STANDARDS

The FAA's airport design standards provide basic guidelines for a safe, efficient, and economic airport system. The FAA's standards and recommendations are primarily presented in a series of Advisory Circulars (AC). FAA AC 150/5300-13A *Airport Design* (AC 5300-13A), is the primary AC that covers design standards that apply to RBG. Additional information related to design standards can be found in **Chapter 1, Inventory and Environmental Overview**.

Design Standards Concepts

The FAA is responsible for overseeing all civil aviation activity in the United States. Standards and recommendations by the FAA are based on safety as the highest priority. Due to a constantly evolving and developing aviation industry, changes to airfield design standards are expected to evolve alongside the development of new aircraft, technologies and procedures.

Airport Reference Codes (ARC)

AC 5300-13A uses a coding system to determine design standards for an airport. When combined, the Aircraft Approach Category (AAC) and Airplane Design Group (ADG) of an airport yield the Airport Reference Code (ARC), which is the FAA classification for airfield design. AAC is based on the reference landing speed of similarly grouped aircrafts. ADG is a classification of aircraft based on wingspan and tail height of aircraft.

Runway Design Code (RDC)

The Runway Design Code (RDC) builds on the ARC by adding a third component for runway approach visibility minimums, expressed as Runway Visual Range (RVR). The design aircraft and RDC determine the scale and setbacks of airfield facilities. **Table 3-1** summarizes the existing and future RDC for the Airport based on critical design aircraft ARC and approach minimums. **Table 3-2** summarizes the FAA design standards, existing conditions and Airport compliance with the standards and any recommended actions.

Table 3-1: Runway Design Code

Runway		AAC	ADG	Approach Visibility Minimums	Design Aircraft
16/34	Existing	B	II	Greater than 1 mile	Cessna Citation II
	Future	No Change	No Change	Greater than 1 mile	Cessna Citation XLS

Table 3-2: **Runway 16/34 Design Standards Matrix**

Runway 16/34 RDC:		B-II		
Item	**Existing Conditions**	**FAA Design Standards**	**Meets Standards?**	**Disposition**
Runway Design				
Width	100 ft.	75 ft.	Exceeds	Reduce[1]
Shoulder Width	10 ft.	10 ft.	Yes	No Action
Blast Pad Width (Runway 16)	100 ft.	95 ft.	Exceeds	Reduce[1]
Blast Pad Length (Runway 16)	150 ft.	150 ft.	Yes	No Action
Blast Pad Width (Runway 34)	N/A	95 ft.	No	Add to ALP
Blast Pad Length (Runway 34)	N/A	150 ft.	No	Add to ALP
Crosswind Component (all weather)	99.87% @ 16 knots	99.96% @ 16 knots	Yes	No Action
Gradient (maximum)	1.50%	2.00%	Yes	No Action
Runway Protection				
Runway Safety Area (RSA)				
Length beyond departure end	300 ft.	300 ft.	Yes	No Action
Length prior to threshold	300 ft.	300 ft.	Yes	No Action
Width	150 ft.	150 ft.	Yes	No Action
Runway Object Free Area (ROFA)				
Length beyond departure end	300 ft [2]	300 ft.	No	Add to ALP
Length prior to threshold	300 ft	300 ft.	Yes	No Action
Width	500 ft [2]	500 ft.	No	Add to ALP
Runway Obstacle Free Zone (OFZ)				
Length prior to threshold	200 ft.	200 ft.	Yes	No Action
Width	400 ft.	400 ft.	Yes	No Action
Inner Approach OFZ	N/A	N/A	N/A	N/A
Inner Transitional OFZ	N/A	N/A	N/A	N/A
Length	1000 ft.	1,000 ft	Yes	No Action
Inner Width	500 ft.	500 ft.	Yes	No Action
Outer Width	700 ft.	700 ft.	Yes	No Action
Departure Runway Protection Zone (RPZ)				
Length	1000 ft.	1000 ft.	Yes	No Action
Inner Width	500 ft.	500 ft.	Yes	No Action
Outer Width	700 ft.	700 ft.	Yes	No Action
Runway Separation				
From Runway Centerline to:				
Hold Line	200 ft.	200 ft.	Yes	No Action
Parallel Taxiway Centerline	240 ft.	240 ft.	Yes	No Action
Aircraft Parking Area	300 ft.	250 ft.	Yes	No Action

1: Reduction will occur when the pavements require reconstruction

2: The ROFA at the South End of Runway 34 does not meet standards

Taxiway Design Group (TDG)

The TDG design criteria is a new FAA design standard incorporated in AC 5300-13A. The previous RBG Airport Layout Plan (ALP) and subsequent ALP updates have not addressed this new standard. The TDG standard accounts for the critical design aircraft's outer-to-outer main gear width (MGW) and cockpit to main gear distance (CMG). The TDG for an airport dictates the taxiway widths and fillet geometries. The FAA taxiway design groups are illustrated below in **Figure 3-2**. Based on the wheel configuration of the Cessna Citation XLS, the taxiway design standard for the Airport is TDG-2.

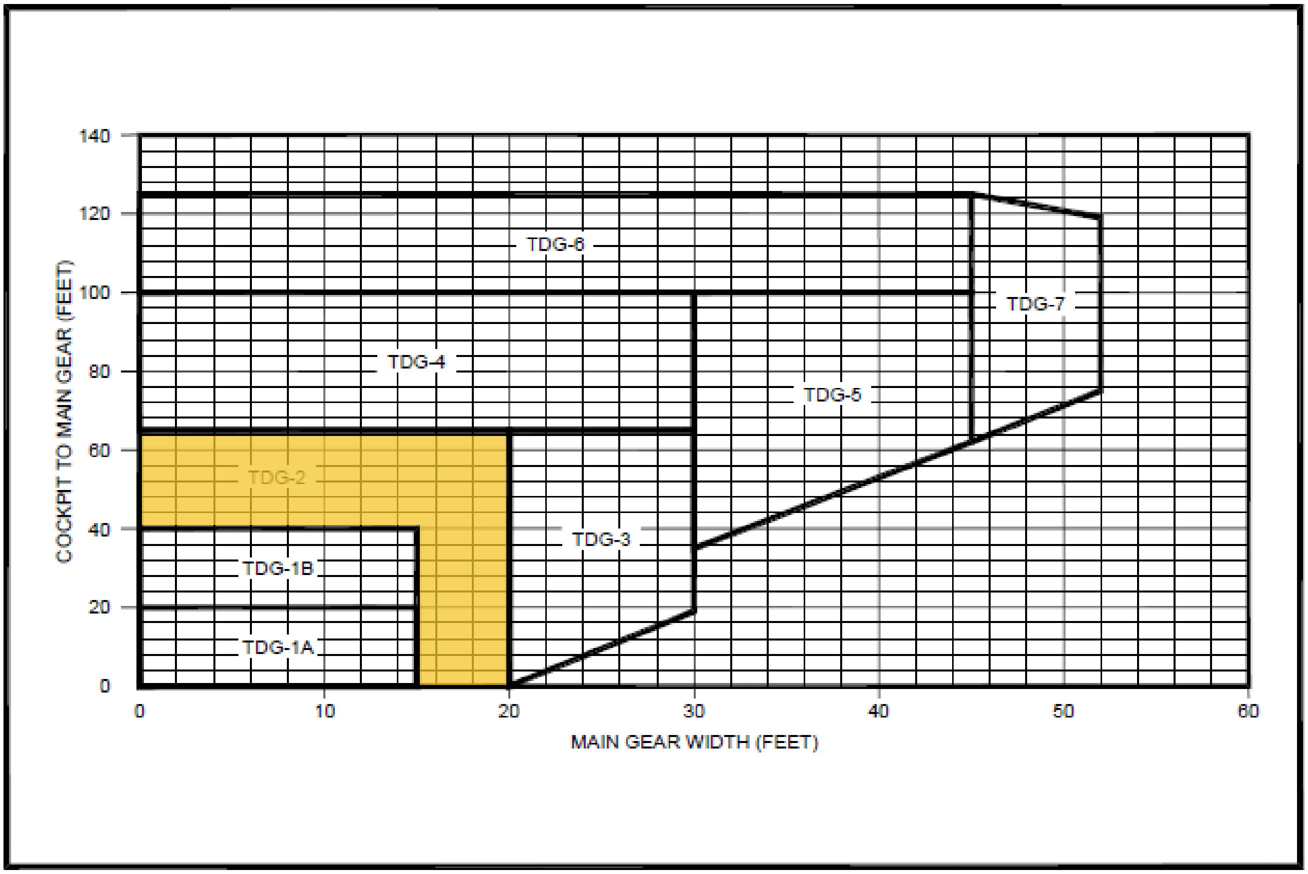


Figure 3-2: Taxiway Design Groups

Source: FAA AC 150/5300-13A – Change 1, Airport Design, February 2014

3.1.3 Runway Capacity and Utilization

Airfield Capacity

Airfield capacity is a measure of airport operational performance. The Annual Service Volume (ASV) is the FAA method to quantify airport capacity and delay. The ASV, as defined in AC 150/5060-5, *Airport Capacity and Delay* (AC 150/5060-5), is the number of annual aircraft operations accommodated by the runway and taxiway configuration. The ASV is calculated from the Airport's annual, monthly, and hourly operational levels, in consideration of the following factors:

- Runway orientation and taxiway system configuration
- Runway traffic volume and utilization during peak periods (aircraft types, categories, and operational mix usage)
- Meteorological/weather conditions (visual, instrument, low instrument-airport closed)
- Runway instrumentation and lighting systems

Annual Service Volume (ASV):
A reasonable estimate of an airport's annual operational capacity.

Demand:
The magnitude of aircraft operations to be accommodated in a specified period, provided by the forecasts.

Capacity:
A measure of the maximum number of aircraft operations that can be accommodated on an airport in one hour.

Delay:
The difference between the actual time it takes an aircraft to operate on the airfield and the time it would take the aircraft if it were operating without interference from other aircraft, usually expressed in minutes.

The ASV is calculated by formula using the weighted hourly capacity (C), average daily demand (D), and average peak hour demand (H) by equation (ASV = C x D x H). FAA Order 5090.38, "Field Formation of the National Plan of Integrated Airport Systems (NPIAS)" recommends the planning process for an additionally runway to enhance capacity when 60 percent of the ASV has been reached. **Table 3-3** summarizes the ASV analysis inputs. **Figure 3-3** depicts the runway-use configuration.

Annual Service Volume (ASV) Capacity Analysis

Runway 16/34 and associated parallel taxiway configurations provide an airfield capacity of 230,000 aircraft operations per year. There were 31,869 operations in 2016, and the FAA approved forecasts project 38,350 operations by 2036. This indicates that in 2017, the airfield will be at 14 percent of the available capacity. The ASV analysis does not indicate areas of systemic airfield capacity challenges on an annual basis. Future operations do not exceed the FAA 60-percent threshold to trigger planning for a secondary runway. **Table 3-4** summarizes the ASV and hourly capacity for the Airport.

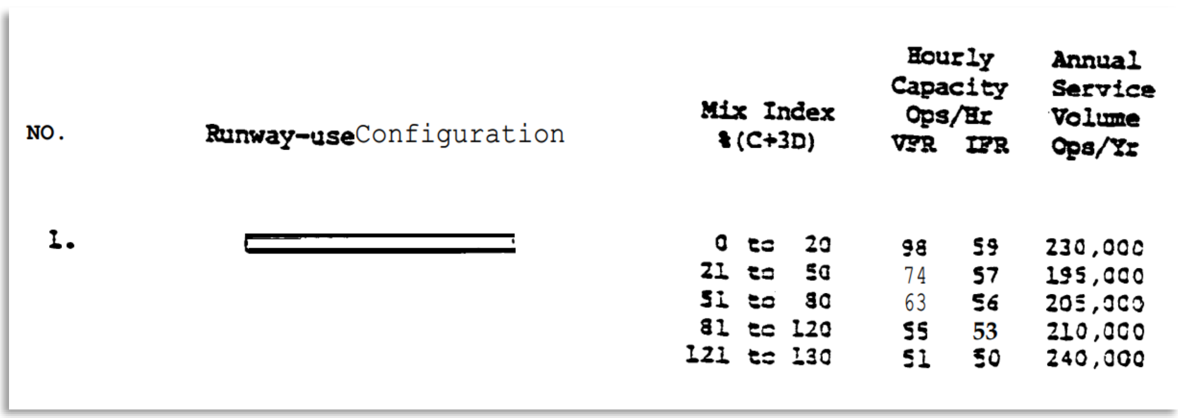
Table 3-3: Mix Index

Description	Quantity
Landings[1]	15,935
Operations (> 12,500 lbs)[2]	5,060
Total RBG 2016 Operations	31,869
C	15.9
D	0.0
Mix Index	15.9

1: Includes Air Carrier/Air Taxi/Commuter/Air Tanker/Air Cargo for Aircraft over 12,500 lbs

2: Operations = Landings x 2

Source: FAA AC 150/5060-5 – Change 1 and 2, *Airport Capacity and Delay*, September 1983



NO.	Runway-use Configuration	Mix Index %(C+3D)	Hourly Capacity Ops/Hr VFR	IFR	Annual Service Volume Ops/Yr
1.		0 to 20	98	59	230,000
		21 to 50	74	57	195,000
		51 to 80	63	56	205,000
		81 to 120	55	53	210,000
		121 to 130	51	50	240,000

Figure 3-3: Runway Configuration

Source: FAA AC 150/5060-5 – Change 1 and 2, *Airport Capacity and Delay*, September 1983

Table 3-4: Annual Service Volume and Hourly Capacity

Runway Use Configuration	Mix Index (C+3D)	Capacity (Operations/Hour) VFR	IFR	Annual Service Volume (Operations/Year)
#1	**0 to 20**	**98**	**59**	**230,000**
	21 to 50	74	57	195,000
	51 to 80	63	56	205,000
	81 to 120	55	53	210,000
	121 to 130	51	50	240,000

Source: FAA AC 150/5060-5 – Change 1 and 2, *Airport Capacity and Delay*, September 1983

Runway Utilization

The runway utilization percentage is determined from airport users and analysis of wind observations. The activity level percentages reflect an annualized average of total Airport traffic. Prevailing winds at RBG are from the north, so the dominant runway use is on Runway 34. Airport users report that Runway 34 is utilized for 80 percent of aircraft operations.

3.1.4 RUNWAY ALIGNMENT

Wind patterns are important for assessing runway traffic levels, aircraft mix, runway operational utility and noise modeling. Wind data for the Airport is collected from the RBG Automated Surface Observing System (ASOS) and is sent to the National Oceanic and Atmospheric Administration (NOAA). AC 5300-13A states that if the primary runway is not aligned with the prevailing wind 95 percent of the time annually, then a crosswind runway may be justified. The crosswind component of wind patterns is the resultant vector which acts at a right angle to the runway.

Runway 16/34 is an ARC B-II category runway with a crosswind component of 13 knots. The crosswind coverage was computed using FAA standards for an annualized wind observation in **Chapter 1, Airport Inventory and Environmental Overview**. Runway 16/34 attains 99.87 percent crosswind coverage at 10.5 knots, and 99.96 percent at 13.0 knots for all-weather conditions. Therefore, a crosswind runway at the Airport is not justified.

3.1.5 RUNWAY LENGTH

This section summarizes the findings and recommendations for runway length found in **Appendix F, Runway Length Analysis**. The analysis identifies a single length in consideration of aircraft design characteristics and annual activity levels. For planning purposes, the future runway length should be suitable to meet the takeoff and landing performance distances of the critical design aircraft, or the regular use threshold for a grouping of the aircraft fleet with similar characteristics. At RBG, the large business jets are the most demanding type of aircraft in terms of runway length requirements.

The runway length study follows a five-step procedure to determine the recommended runway lengths at airports as described in AC 150/5325-4B:

- **Step 1** – *Identify the list of critical design airplanes*. As determined in **Chapter 2, Aviation Activity Forecasts** the critical design grouping of airplanes is B-II aircraft as represented by the Cessna Citation XLS.

- **Step 2** – *Identify the airplanes that will require the longest runway lengths at maximum certificated takeoff weight*. The Cessna Citation XLS maximum certificated takeoff weight (MTOW) is 20,200 pounds.

- **Step 3** – *Determine the method that will be used for establishing the recommended runway length*. When the MTOW aircraft identified in step 2 is 60,000 pounds or less, the recommended runway length is determined according to a family grouping of airplanes having similar performance characteristics and operating weights. For this reason, Chapter 3 of AC 150/5325-4B, Table 1-1 will be used to establish the recommended runway length based on 75 percent fleet mix as shown in **Appendix F, Table F-3**.

- **Step 4** – *Select the recommended runway length*. The design procedure outlined in Chapter 3 of AC 150/5325-4B requires the airport elevation above mean sea level (533.5 ft), mean daily maximum temperature of the hottest month at the airport (83º F), and the critical design airplanes under evaluation with their respective useful loads. See **Appendix F, Figure F-1 and F-2** for the aircraft performance curve charts. The useful load of an aircraft is defined as the difference between the maximum allowable structural gross weight and its operating weight empty, or in other words, the load that can be carried by the aircraft comprising passengers, useable fuel, and cargo. Generally, longer haul lengths require higher useful loads to accommodate fuel carriage and consumption. Due to the insufficient data available from Traffic Flow Management System Counts (TFMSC) and FlightAware, not enough information is available to accurately determine if jet aircraft at the Airport are operating at 90 percent of their useful load. For this reason, the 60 percent useful load runway length is used, which yields a runway length of 4,677 feet.

- **Step 5** – *Apply any necessary adjustment to the obtain runway length*. The runway lengths obtained from **Appendix F, Figures F-1** and **F-2** are based on a runway with no wind, a dry runway surface, and zero effective runway gradient. To determine the recommended runway length, adjustments for effective runway gradient and wet and slippery runway conditions need to be applied. These increases are not cumulative since the runway gradient adjustment applies to takeoffs and the wet and slippery runway conditions adjustment applies to landings. After both adjustments have been independently applied, the larger resulting runway length becomes the recommended runway length.

Effective Runway Gradient (Takeoff Only)

The runway length obtained from **Step 4** is increased at a rate of 10 feet for each foot of elevation difference between the high and low points of the runway centerline. The high point elevation on Runway 16/34 is 533.5 feet and the low point elevation is 500.8 feet. This results in an increase of 327 feet to the runway length found in **Step 4**. The adjusted runway length based on effective runway gradient is 5,004 feet.

Wet and Slippery Runways (Landing Only)

By regulation, the runway length for turbojet-powered airplanes obtained from the "60 percent useful load" curves are increased by 15 percent or up to 5,500 feet, whichever is less, for wet and slippery conditions. When the 15 percent increase is applied to the runway length found in **Step 4**, the adjusted runway length is 5,400 feet.

Runway Length Recommendations

The result of the runway length analysis is an FAA justifiable runway up to 5,400 feet.

3.1.6 RUNWAY WIDTH, SHOULDER, AND BLAST PAD

Runway width standards are a function of the design aircraft characteristics (ADG), aircraft takeoff weight, and runway visibility minimums (statute miles).

Runway 16/34

Runway 16/34 is 100 feet wide. The ARC B-II design criteria for runway width is 75 feet wide with a 10-foot wide shoulder. The ARC B-II design criteria dimensions for the runway blast pad are 95 feet wide by 150 feet long. There is a blast pad for the Runway End 16, but not for the Runway 34 end. Adding a blast pad at the end of pavement prior to the Runway End 34 is recommended to prevent erosion effects of jet blast in the safety area prior to the paved surfaces.

3.1.7 RUNWAY DESIGN SURFACES

Complete definitions, descriptions, and dimensions of the Airport's runway design surfaces can be found in **Chapter 1, Inventory and Environmental Overview**. Below is a discussion about deficiencies within the Airport's runway design surfaces. Deficiencies are depicted in **Figure 3-4**.

Runway Safety Area (RSA)

The RSA is a defined surface surrounding the runway that provides a graded clear area to reduce the risk of damage to aircraft in the event of an undershoot, overrun, or excursion from the runway. Under dry conditions, the RSA must be capable of supporting Aircraft Rescue and Firefighting (ARFF) equipment and the maintenance vehicles. Additionally, the RSA must be free of objects except for those that need to be in the RSA because of their function, such as lights, signs, and ground-based navigation equipment. The RSA for the Airport meets FAA design standards. The Airport is required to maintain a clear and graded RSA.

Runway Object Free Area (ROFA)

The ROFA, like the RSA, is a design surface intended to enhance the safety of aircraft operations by clearing above-ground objects protruding above the nearest points of the RSA. As documented in **Chapter 1, Inventory and Environmental Overview**, the ROFA beyond the Runway 34 does not meet standards for a small area near NW Stewart Parkway. Alternatives to correct the ROFA for the Airport will be evaluated in **Chapter 4, Improvement Alternatives**.

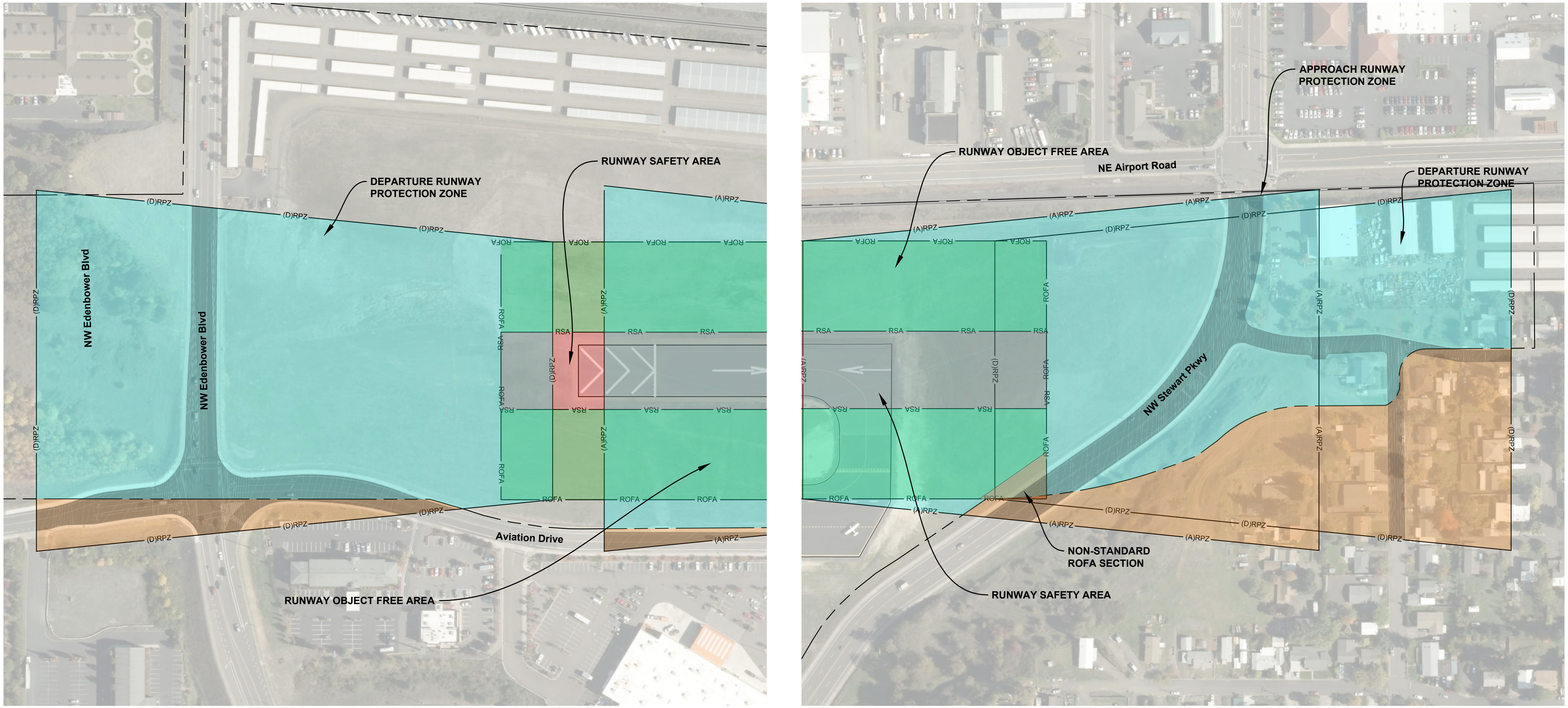
Runway Protection Zone (RPZ)

The RPZ is a trapezoidal design surface beyond each Runway End to enhance the safety and protection of people and property on the ground. As discussed in **Chapter 1, Inventory and Environmental Overview**, existing incompatible land uses such as roads, homes, and businesses are within the Airport's RPZs. The incompatible land uses are summarized in **Table 3-5**. The FAA does not have the authority to regulate local land use, so it relies on the Airport to work with local authorities to promote compatible development within the RPZs. Although the FAA recognizes that, in certain situations, the Airport may not fully control land within the RPZ, the FAA expects the Airport to take all possible measures to protect against and remove or mitigate incompatible land uses. Alternatives to correct the incompatible land uses within the RPZ's for the Airport will be evaluated in **Chapter 4, Improvement Alternatives**.

Table 3-5: Runway Protection Zone Incompatible Land Uses

RPZ	Airport Property (Acres)		Roads (Acres)	Light Industrial Properties		Single-Family Residential Properties		Mixed Use Properties	
	On	Off		Quantity	Size (Acres)	Quantity	Size (Acres)	Quantity	Size (Acres)
Runway 16 DPZ	11.52	2.26	1.73	0	0	0	0	0	0
Runway 16 APZ	13.54	0.23	0.16	1	3.45	0	0	2	0.22
Runway 34 DPZ	8.09	5.68	1.70	2	2.67	24	3.31	0	0
Runway 34 APZ	10.49	3.28	1.32	1	0.69	2	0.53	0	0

Note: DPZ = Departure Protection Zone, APZ = Approach Protection Zone



Legend

- RPZ On Airport Property
- RPZ Off Airport Property
- Existing Roads Inside RPZs

0 250 500

Figure 3-4
Design Surfaces Deficiencies

3.1.8 PAVEMENT STRENGTH

FAA pavement design standards consider the damage to the pavement from each individual aircraft in the traffic fleet mixture. The final pavement thickness is based upon the cumulative damage of all aircraft. There is no critical design aircraft designated for pavement strength.

The Runway 16/34 pavement strength is 42,000 pounds for single-wheel configuration, 54,000 pounds for dual wheel gear (DWG), and 88,000 pounds dual tandem wheel gear (DTWG). On occasion, Runway 16/34 experiences traffic by larger and heavier aircraft, including large cabin business jets. These aircraft typically have a maximum takeoff weight (MTOW) of 65,000 to 90,000 pounds, but would normally be at less than 100 percent useful load. The recommended pavement strength is 60,000 pounds DWG, to accommodate the small to medium cabin class business jets operating at less than MTOW. **Table 3-6** presents aircraft weight characteristics and recommended aircraft pavement strength requirements.

Table 3-6: Aircraft Weight Characteristics

Aircraft Type/Category	Aircraft Seats (Typical)	FAA ARC	Aircraft Type	MTOW (Pounds)	Gear Type	Applicable Airfield Pavement
Existing Runway 16/34 Pavement Strength: 42,000 (SWG), 54,000 (DWG), 88,000 (DTWG)						
Airport critical design aircraft						
Cessna Citation XLS	8	B-II	GA Business Jet	20,200	SWG	Runway 16/34
Representative Aircraft Categories						
Large Business Jet	10 to 16	C/D-III	GA Business Jet	65,000 to 90,000	DWG	Runway 16/34
Medium Business Jet	8 to 12	C/D-II	GA Business Jet	28,000 to 60,000	DWG	Runway 16/34
Small Business Jet	6 to 8	B/C-II	GA Business Jet	15,000 to 22,000	SWG	Runway 16/34
Turboprop	4 to 10	B-II	GA Turboprop	10,500 to 15,000	DWG	GA Apron
Single/Twin Piston	2 to 6	A/B-I	GA Piston	2,500 to 6,500	SWG	GA Taxilane
Helicopters	4 - 8	N/A	Turbine	20,000 to 50,000	--	GA Apron
Note: The gear type and configuration dictate how the aircraft weight is distributed to the pavement and determines the pavement response to aircraft loadings. (SWG): single-wheel gear aircraft – each landing gear is supported by a single tire. (DWG): dual-wheel gear aircraft – each landing gear consists of a single axle with two tires per axle that equally share the weight of the aircraft and provide for greater weight distribution.						

3.1.9 NAVIGATIONAL AIDS AND PROCEDURES

The FAA is currently developing the Next Generation Air Transportation System (NextGen) to transition from ground-based Navigational Aids (NAVAIDs) to satellite-enabled navigation systems. NextGen is not one single technology. NextGen is a portfolio of innovative technologies. Satellites allow for the FAA to create optimum routes anywhere in the National Airspace System (NAS) for departure, cruising altitude, approach and arrival operations. The higher precision of operations afforded as part of NextGen can reduce flying time, fuel use, increase safety, and aircraft exhaust emissions while getting aircraft to their destinations at more predictable times. In a modernized NAS, aircraft must be able to receive complex instructions that can identify where they need to be and at what time. NextGen development is occurring simultaneously with improvements in aircraft onboard avionics. As the NextGen system develops, many ground-based NAVAIDs will be decommissioned at the end of their useful lives or maintained as backup systems.

RBG's on-airport NAVAIDs include Runway End Identifier Lights (REILs) on both runway ends, a non-directional rotating light beacon, automated surface observing system, a primary wind cone with segmented circle, and a Precision Approach Path Indicator (PAPI) that is expected to be active in the summer of 2018. RBG's one off-airport NAVID is a Very-High Frequency Omni Directional (VOR) for operations on the Runway 34 end. It is recommended that RBG's NAVAIDs should be maintained to FAA standards for aircraft without satellite receivers.

The airspace analysis conducted as part of this Master Plan allows the FAA to evaluate the potential for new Instrument Approach Procedures (IAPs). New IAPs that improve visibility minimums have the potential to increase RPZ dimensions. Additionally, new IAPs such as a ≥1 statue mile straight in approach are recommended to have ground-based approach lights. Due to Airport property space constraints on both runway ends, it is recommended the Airport consider the tradeoffs when pursuing lower visibility minimums.

3.1.10 AIRSPACE

Chapter 1, Inventory and Environmental Overview, Section 1.2.5 for instrument procedures and navigational aids identified existing obstacle penetrations in approach surfaces. In November 2015, the FAA Office of Air Traffic Organization (ATO) issued notice to the Airport identifying obstacles penetrating the IAP 20:1 Visual Surface for Runway 34. The identified obstacles included ground penetrations from Mt. Nebo south of the Airport and numerous tree penetrations. The penetrations to the 20:1 Visual Surface resulted in the loss of IAPs for Runway 34 during night operations. As a corrective measure to reestablish nighttime instrument approaches for approach category A and B aircraft, a new PAPI set to 4-degree glide path (steeper approach than the 3-degree standard approach slope) is being installed. Primary airspace restrictions are due to obstacles and rising terrain that penetrate approach surfaces. The obstacles and terrain on approach to RBG result in displaced thresholds at each end of the runway. The existing penetrations to the Runway 16 and Runway 34 20:1 Visual Surfaces are described below in **Table 3-7**.

Table 3-7: Runway 16-34 20:1 Visual Surface Penetrations

Runway End	Terrain Removal (Cubic Yards)	Tree Cluster Removal	Power Poles
16	146,726	37	4
34	30,500	18	3

Alternatives to reestablish night time IAPs will be evaluated in **Chapter 4, Improvement Alternatives**. Further Terminal Instrument Procedures (TERPS) analysis is required by the FAA to determine the feasibility of reducing minimums for instrument procedures to Runway Ends 16 and 34, including the possibility of a curved Required Navigation Performance (RNP) procedure. AN RNP procedure requires on-board navigation performance monitoring and alerting equipment to ensure that an aircraft stays within a specific containment area.

3.1.11 PAVEMENT MARKINGS, LIGHTING AND SIGNAGE

Runway Markings

Runway markings are white. The requirements for runway markings depend on its approach category. The markings on non-precision Runway 16/34 include runway landing designators, threshold markings, and centerline markings. AC-150/5340-1L, Table 2-1 *Minimum Required Runway Surface Marking Schemes for Paved Runways*, states that, for non-precision approach runways, an aiming point is required on instrumented runways 4,200 feet long or longer. Runway 16/34 is 5,003 feet in length and an instrument runway based on the IAPs described in **Chapter 1, Inventory and Environmental Overview, Table 1-8**. Runway 16/34 currently does not have any runway aiming point markings.

Taxiway Markings

Taxiway markings are yellow. At airports without operating control towers, holding position markings identify the location where pilots should make sure their aircraft have adequate separation from other aircraft operating on the runway. The markings on the taxiways at the Airport include centerline, taxiway edge marking, and runway holding position markings.

Runway Lighting

Runway 16/34 has Medium Intensity Runway Lights (MIRLs) and each end is equipped with Runway End Identifier Lights (REILs). A PAPI is currently being installed at the Runway 34 End.

Chapter 1, Inventory states the electrical infrastructure was constructed in the 1970s. The 2018 RBG Capital Improvement Plan (CIP) includes a 2019 project to design and complete a runway lighting rehabilitation project.

Taxiway Lighting

Taxiway A is equipped with Light Emitting Diode (LED), medium-intensity taxiway edge lighting (MITL). Taxiway lighting at RBG is in good condition and functions as intended.

Signage

The airfield is equipped with new runway and taxiway signs installed in 2013 as part of the Taxiway C relocation. The signs are in good condition.

3.1.12 TAXIWAY SYSTEM ANALYSIS

The taxiway system on an airport is a series of designed paths for the taxiing of aircraft from one part of an airport to another. Like runways, the FAA design standards outlined in AC 5300-13A provided guidance on recommended taxiway and taxilane layouts to enhance safety by avoiding runway incursions and to enable safe and efficient taxiing by aircraft. Taxiway design standards are defined in **Chapter 1**, **Airport Inventory and Environmental Overview**. This section analyzes the existing Airport taxiway system and recommends improvements based on FAA design standards. In general, taxiways should be designed to increase pilot situational awareness. A pilot who knows where they are on an airport is less likely to enter a runway improperly. The use of the three-node concept is intended to reduce taxiway design complexity by keeping taxiway systems simple.

Direct Access to Runways

One of the methods to reduce runway incursions is by designing taxiways that do not lead directly from an apron to a runway without requiring a direction change prior to arriving at the runway entrance. Direct access from the apron without any change in direction to the runway can potentially lead to a runway incursion. A pilot typically expects to encounter a parallel taxiway and if distracted or confused, a pilot may lose situational awareness and inadvertently enter the runway environment. Three areas on the airport, listed below and identified on **Figure 3-5**, currently have direct access.

- Taxiway A3
- Taxiway A4
- Taxiway A5

Runway Incursions:

Any occurrence at an airport involving the incorrect presence of an aircraft, vehicle or person on the protected area of a surface designated for the landing and takeoff of an aircraft.

Three-Node Concept:

In this design concept, a pilot is presented with no more than three choices at an intersection – ideally, left, right, and straight ahead.

Avoid "High Energy Intersections"

AC 5300-13A states that when designing taxiways "high energy" intersections in the middle third of runways should be avoided. However, the fleet mix of aircraft that operate at the Airport includes large numbers of single-engine piston aircraft and Jet aircraft. The majority of aircraft operations at RBG are performed by single-piston engine. The single-piston engine Airport users report that Taxiway A4, the taxiway connector currently located in the middle third of the Runway is the most used exit taxiway for exiting Runway 16/34. The removal of Taxiway A4 would greatly increase runway occupancy time for single-engine piston aircraft. It is recommended for Taxiway A4 to remain at the Airport.

Increase Visibility

Right-angle intersections, whether between taxiways or between taxiways and runways, provide the best visibility to the left and right for a pilot. A right-angle turn at the end of the parallel taxiway is a clear indication of approaching a runway. Acute-angle exit taxiways can improve runway capacity but should not be used for runway entrance or crossing points.

Partial Parallel Taxiway A

Full-length parallel taxiways prevent using the runway for taxiing, and therefore, reduce runway occupancy time and protection for the aircraft under low visibility condition. As discussed in **Chapter 1, Inventory and Environmental Overview**, the Airport does not have a full-length parallel taxiway for the last 400 feet on the Runway 16 end. According to AC 5300-13A, Table 3-4, *Standards for Instrument Approach Procedures,* the FAA recommends that airports with circling instrument approaches such as RBG have a full-length parallel taxiway. The lack of a full-length parallel taxiway causes aircraft to perform back-taxi operations which increases runway occupancy time.

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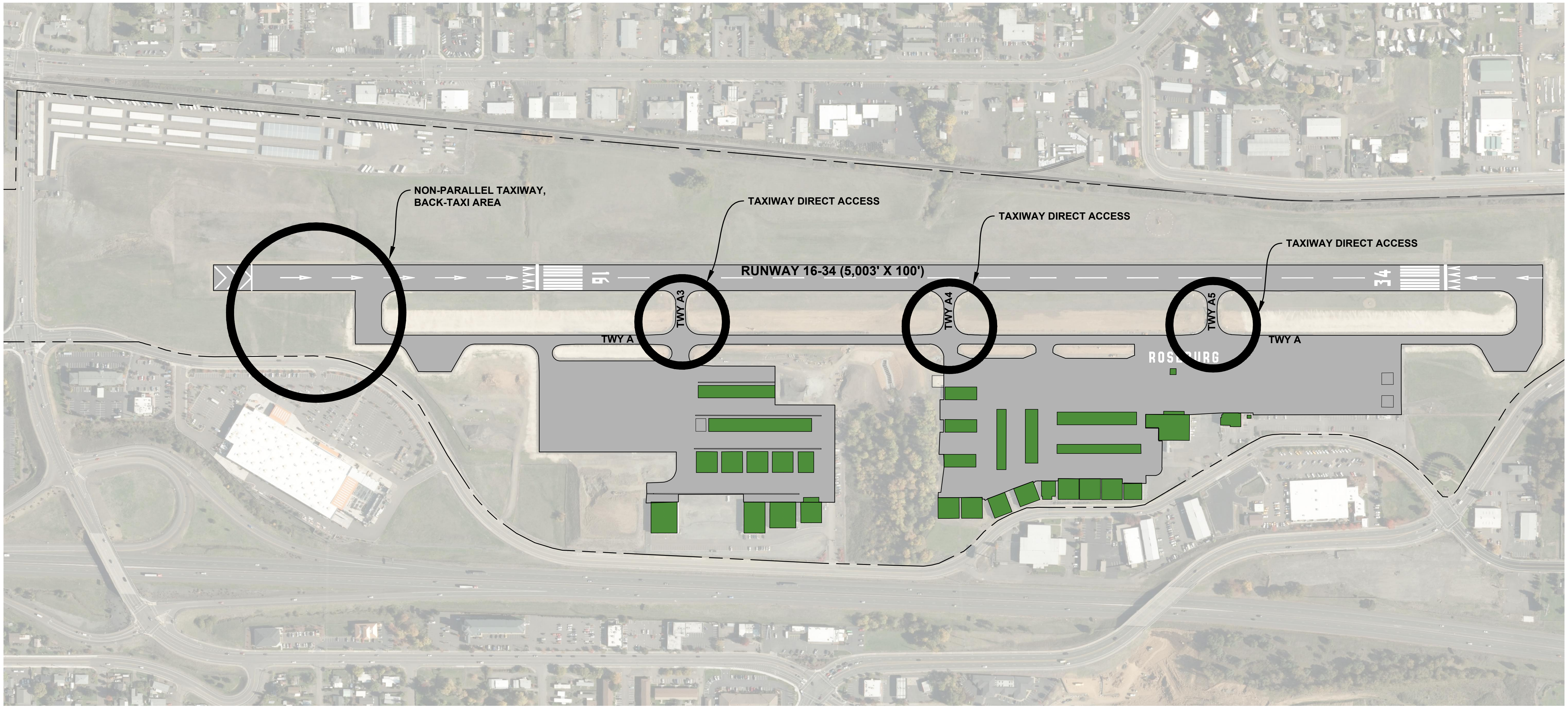

Figure 3-5
Taxiway Design

3.2 LANDSIDE FACILITY REQUIREMENTS

This section describes areas and facilities that support Airport activity. Landside facilities include aircraft support facilities, aprons, access roads, and vehicle parking facilities.

3.2.1 AIRCRAFT APRONS

The Airport has two apron areas, the south apron and the north apron. The aprons serve the landside facilities such as the Fixed Based Operator (FBO), aviation hangars, and transient parking for fixed-wing and helicopter aircraft. The Airport has 57 single-engine aircraft tie-downs, 11 multi-engine aircraft tie-downs, and three designated helicopter apron parking spaces. The based aircraft apron parking is accommodated on the north ramp with 26 single-engine tie-down spaces, five twin-engine tie-down spaces and two for helicopters. Based aircraft are forecasted to increase from 98 to 104, with three of those expected to be jet aircraft. Jets are more likely to be stored in hangars to be protected from the elements. Based aircraft tie-down spaces are sufficient for existing and forecasted demands of based aircraft.

A larger demand is placed on apron tie-down capacity by itinerant aircraft. Itinerant aircraft are more likely to use tie-down spaces for short-term stays. **Chapter 2, Aviation Activity Forecast**, shows an annual increase of 5,291 operations by itinerant aircraft in 2036. This averages to an increase of 14.25 itinerant aircraft operations per day by 2036. Existing apron tie-down capacity can accommodate the expected increase of itinerant aircraft for the planning period. However, additional apron space should be designated for development purposes in case demand increases to existing capacity levels. Based on the existing number of tiedowns aircraft, and the estimated increase in based aircraft and overall operations described in **Chapter 2, Aviation Activity Forecasts,** an additional 10 tie-down spaces and approximately 100,000 square feet, or 2.3 acres, of apron will be required.

3.2.2 DOUGLAS FIRE PROTECTION AGENCY (DFPA) APRON

During forest fire events the DFPA uses a temporary operations site on the far north apron. The Single Engine Air tanker (SEAT) aircraft operations reduce the available tie-down spaces for use by based aircraft. The temporary site does not have a fixed water or power supply for DFPA's equipment and retardant tanks.

It is recommended that alternatives be evaluated in **Chapter 4, Improvement Alternatives**, for a permanent, designated DFPA operations site that supports firefighting activity and mitigates the impacts to apron tie-down users.

3.2.3 AIRCRAFT STORAGE

The inventory count of based aircraft conducted in September 2017 shows 108 aircraft being stored at RBG. The existing airport hangar capacity has spaces for 59 single-engine aircraft T-hangars, 12 multi-engine T-hangars, and 18 spaces in corporate box hangars for a total of 89 aircraft spaces. Many of the corporate box hangars at the Airport house more than one aircraft.

The forecast for based aircraft shows an expected increase of eight based aircraft by 2036. As noted in **Chapter 2, Aviation Activity Forecasts,** the largest increase in based aircraft is expected to be in aircraft that require larger, corporate-style box hangars. Three jet aircraft, four single-engine piston, two helicopters, and the loss of one multi-engine piston aircraft is forecasted.

It is recommended that hangar development layouts be evaluated to infill vacant areas within existing hangar developments and evaluate a mix of hangar types within undeveloped sites. Based on the existing number of based aircraft at the Airport, and the estimated in increase in based aircraft described in **Chapter 2, Aviation Activity Forecast**, an additional 10 hangars are needed to accommodate the forecasted demand.

3.2.4 AIRCRAFT SUPPORT FACILITIES

Fuel Facilities

Table 1-12 in **Chapter 1, Inventory and Environmental Overview** summarizes the fuel storage capacity at the airport. The FBO has two 12,000-gallon, above-ground tanks, with one tank each for Jet-A fuel, and 100-LL AvGas. Two privately owned, under-ground tanks for Jet-A are also on the airfield. Based on interviews with the FBO and airport users, the existing fuel facilities are sufficient.

Snow Removal Equipment (SRE)

AC 150/5200-30D states that non-commercial service airports with over 10,000 operations and at least 15 inches of annual snowfall should have, as a minimum, one high-speed rotary plow (snow blower) supported by two snow plows of equal snow removal capacity. Although RBG has over 10,000 operations per year, the City experiences on average less than 1 inch of snow per year, and therefore, SRE is not required.

3.2.5 VEHICLE ACCESS

Users access the Airport's FBOs, hangars, and aprons from Aviation Drive between the NW Stewart Parkway to the south and NW Edenbower Boulevard to the north. Entrance roads off Aviation Drive serve as access points to individual businesses and hangar sites. There are no vehicle access points to the airport from the east side of the airfield. Vehicle access to the airport is controlled by gates.

3.2.6 NON-AVIATION REVENUE DEVELOPMENT

The Airport is developed for aviation use on the west side of the Airfield. Due to Airport property space constraints, the east side of the Airfield has been developed for non-aviation revenue areas. The mini-storage facilities generates the largest amounts of annual non-aviation revenue for the Airport.

A Building Restriction Line (BRL) is a line that identifies suitable and unsuitable locations for buildings on airports. BRLs are set beyond runway design surfaces. Based on the existing Building Restriction Line for RBG an additional 3.29 acres of land adjacent to the existing non-aviation land use area is available development on the east side of the Airport. The BRL and available developable area for the Airport is depicted in **Figure 3-6**. Due to the small size of the available developable area on the east side, it is not a sufficient area to construct aviation facilities such as hangars and apron parking areas. It is recommended the east side of the Airport be reserved for future non-aviation use.

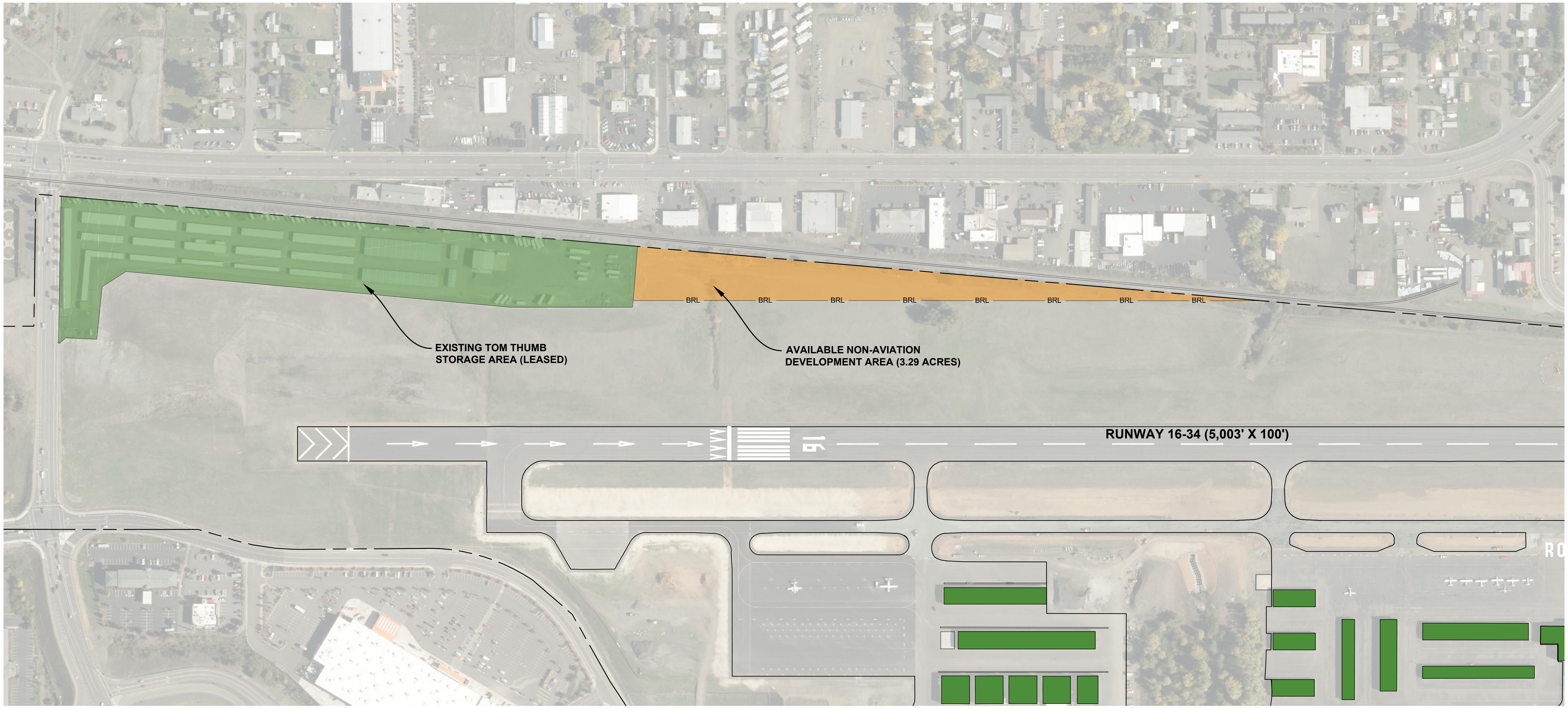

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Figure 3-6
Non-Aviation Development Area

3.3 FACILITY REQUIREMENTS SUMMARY

The following section summarizes the facility requirements needed to meet the forecasted 20-year growth at the Airport.

Airside Facilities Requirements

- The Cessna Citation XLS is the most demanding aircraft for runway length and represents the B-II ARC as the critical aircraft
- TDG-2 is the standard that should be used for Taxiway Design
- The recommended runway length for RBG based on AC 150/5325-4B is 5,400 feet
- The ROFA does not meet design standards at the area nearest NW Stewart Parkway
- Taxiways A3, A4, A5 should be relocated to remove direct access from the Airport aprons to Runway 16/34
- A full-length parallel Taxiway A should be constructed.

Landside Facility Requirements

- Site aircraft storage hangars should accommodate forecasted growth of eight additional based aircraft.
- Provide a dedicated area for firefighting activity
- Reserve Airport property outside the Building Restriction Line on the east side of the airfield for non-aviation development

IMPROVEMENT ALTERNATIVES

CH. 4

ROSEBURG REGIONAL AIRPORT
CHAPTER 4: IMPROVEMENT ALTERNATIVES

CHAPTER OVERVIEW

This chapter evaluates a series of alternatives to satisfy the Roseburg Regional Airport's (RBG or the Airport) facility requirements, described in **Chapter 3, Facility Requirements**, and the 20-year aviation forecast activity described in **Chapter 2, Aviation Activity Forecasts**. This chapter presents the Airport alternatives in the following sections:

- Airport Development Objectives
- Evaluation Criteria
- Evaluation Process
- Airport Development Alternatives
- Alternatives Summary
- Preferred Alternative

The alternatives presented in this chapter relate to the Airport's runway, taxiways, general aviation development, vehicle parking, support facilities, and non-aeronautical development. The basis for alternative analysis are these four criteria: alignment with operational performance, environmental considerations, financial feasibility, and stakeholder feedback. Feedback was collected throughout the planning process from an involved collaborative effort with the Master Plan Advisory Committee (AC) and the public. The AC is a diverse group of City of Roseburg officials, on- and off-airport businesses, and members of the pilot community. The AC's role in the Master Plan is to help shape the document to ensure it reflects community goals and interests while satisfying Federal Aviation Administration (FAA) requirements.

The outcome of the alternatives analysis, AC input, and public feedback is the selection of the Preferred Alternative. The Preferred Alternative is carried forward into the Airport Capital Improvement Program, as described in **Chapter 6, Capital Improvement Program,** and the Airport Layout Plan (ALP) as described in **Appendix A, Airport Layout Plan**. When the FAA approves an ALP, that indicates that the existing facilities and proposed development depicted on the ALP conform to the FAA airport design standards and finds proposed development to be safe and efficient. Furthermore, proposed development shown on an FAA-approved ALP is considered eligible for Airport Improvement Program (AIP) funding.

4.1 AIRPORT DEVELOPMENT OBJECTIVES

The master planning process is intended to present various alternatives to address identified facility requirements and accommodate forecasted demand over the next 20 years. Before development and evaluation of specific alternatives, the Airport's objectives for development must be understood. The City of Roseburg (City) has these development objectives for this Master Plan:

- Accommodate future demand over the next 20 years.
- Determine opportunities for increased airport revenue generation from non-aeronautical land.
- Provide development areas for general aviation activities.
- Develop facilities in an environmentally compatible manner.
- Develop facilities according to federal, state, and City regulations.
- Develop facilities consistent with airport stakeholder and community needs.

Development of the Airport is intended to meet long-term demand for both airside and landside needs. Airside facilities include runways, taxiways, support facilities, and hangars. Landside facilities include vehicle parking areas, walkways, public access roads, non-aviation land uses, and other areas of the Airport accessible to the public. The airside and landside planning needs are described below.

4.1.1 AIRSIDE PLANNING

For the 20-year planning term, RBG has these airside needs:

- Improve the reliability of Runway 16/34.
- Address FAA design standards.
- Address the non-full length parallel Taxiway A.

4.1.2 LANDSIDE PLANNING

For the 20-year planning term, RBG has these airside needs:

- Provide a variety of aircraft storage options to meet future based aircraft growth.
- Provide distinct areas for general aviation, helicopter, and aerial firefighting operations.
- Remove incompatible land uses within existing Runway Protection Zones (RPZs) where feasible.
- Maximize buildable property for aeronautical and non-aeronautical development.
- Analyze locations for expanded vehicle parking.

4.2 EVALUATION CRITERIA

These evaluation categories are used to compare each alternative and support an evidence-based comparison:

- Alignment with operational performance
- Financial feasibility
- Stakeholder feedback
- Environmental considerations

The evaluation criteria are described in the following sections.

4.2.1 OPERATIONAL PERFORMANCE

Operational performance refers to the alternatives' ability to meet the needs described in the **Chapter 3, Facility Requirements**. This criteria accounts for the airfield's demand and capacity, FAA design standards, and performance requirement benchmarks.

4.2.2 FINANCIAL FEASIBLITY

Financial feasibility refers to the affordability of the alternatives based on constructability, phasing, and implementation cost factors. Additionally, this criteria is used to evaluate potential revenues and funding sources for each alternative.

4.2.2 STAKEHOLDER FEEDBACK

Input from Airport stakeholders is used to evaluate the alternatives in terms of stakeholders' unique and overlapping concerns and gauge the level of support for each alternative. The consultant obtained stakeholder input from the AC, City of Roseburg, FAA, community members, and members of the public. Public and committee meetings were held on the following dates:

- AC #1 Kickoff – September 21, 2017
- AC #2 Inventory and Forecasts – November 30, 2017
- AC #3 Facility Requirements and Initial Alternatives – May 17, 2018
- FAA Initial Alternatives – May 22, 2018
- Public #1 Final Alternatives – Scheduled for August 2018
- AC #4 Capital Improvement Plan and Financial Feasibly – Scheduled for September 6, 2018

AC, FAA, and public meetings relied on presentations, exhibits, and handouts to help facilitate discussion. The consultants worked with the City to vet insights, suggestions, and recommendations from Airport stakeholders and incorporate their input into the alternatives.

4.2.2 ENVIRONMENTAL CONSIDERATIONS

Environmental considerations study the potential impacts of the alternatives to critical environmental issues and alignment with the Airport's environmental goals. The following environmental elements were considered:

- Air quality
- Historical, architectural, archaeological, and cultural resources
- Section 4(f) property
- Threatened and endangered species
- Water quality
- Wetlands
- Farmland
- Floodplains
- Compatible land uses

This analysis is not intended to fulfill the environmental clearance requirements defined in FAA Order 1050.1F, *Environmental Impacts: Policies and Procedures*, and FAA Order 5050.4B, *National Environmental Policy Act.* However, early considerations of environmental impacts can assist in future development plans.

4.3 EVALUATION PROCESS

This section describes how the City and the consultant evaluated alternatives according to FAA AC 150/5070-6B, *Airport Master Plans*. The development of airport alternatives unites many different elements of the master planning process to meet the existing and future needs of airport users and the City of Roseburg's strategic vision for the Airport.

The foundation for the alternatives development was established in **Chapter 1, Inventory and Environmental Overview**; **Chapter 2, Aviation Activity Forecasts**; and **Chapter 3, Facility Requirements**. Based on the information in these chapters, the consultant developed layouts and alternatives that meet the Airport's existing and long-term development needs.

The process of evaluating alternatives is iterative, beginning with a broad range of possibilities that are then refined based on Alternative evaluation criteria. Use of quantitative and qualitative evaluation criteria helps to refine and eliminate alternatives to arrive at a preferred alternative. Although the assessment of alternatives is based on technical judgment, the most favorable airport improvement alternative considers local planning policies and the social, economic, political and environmental goals of the Airport.

The general airport alternatives development and evaluation process is illustrated in **Figure 4-1**.

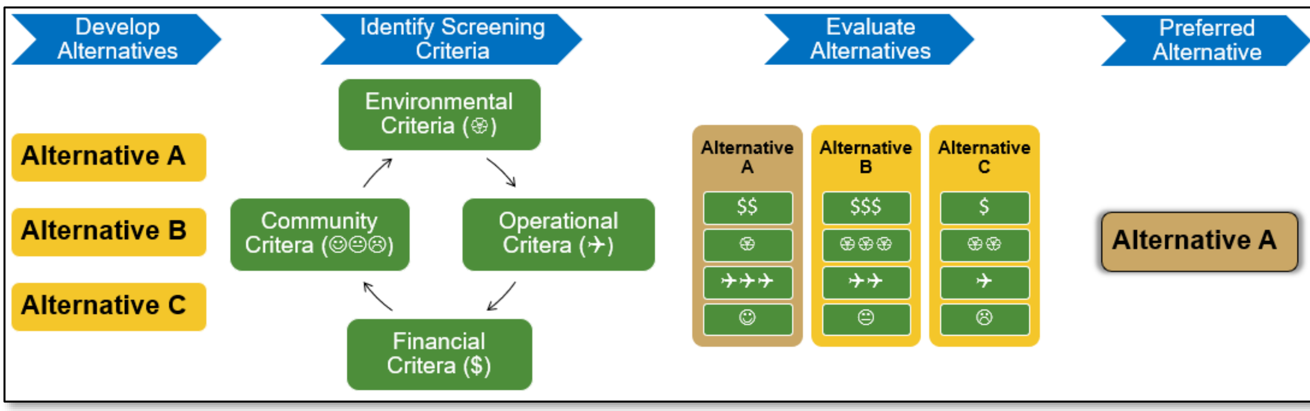


Figure 4-1: Airport Alternatives Development Process

4.4 AIRPORT DEVELOPMENT ALTERNATIVES

In recent years, airport users have had to cope with low reliability associated with restrictions due to topographic and tree obstruction to instrument approaches into the Airport. The airport alternatives primarily focus on altering the runway to resolve these issues and improve the overall reliability of the Airport. These airport alternatives facilitate discussion regarding the most efficient way to meet the facility and forecasted needs of the Airport:

- Alternative 1 – Maintain 4-Degree Precision Approach Path Indicator (PAPI)
- Alternative 2 – 3.77-Degree PAPI
- Alternative 3 – Rotate Runway 2 Degrees
- Alternative 4 – 1,522-foot Runway 34 Displaced Threshold
- Alternative 5 – 5,400-foot Runway

The alternatives share these common factors:

FAA Runway Design Standards

- Add a Runway 34 blast pad.
- Add runway aiming point markings.
- Reduce runway width from 100 feet to 75 feet when rehabilitation is necessary.
- Bring ROFA dimensions into compliance
- Do not change size of RPZ for Runway Ends 16 and 34.

FAA Taxiway Design Standards

- Relocate the taxiway connectors with direct access from the Airport aprons to Runway 16/34.
- Construct a full parallel Taxiway A.
- Maintain the middle runway exit taxiway for small aircraft to reduce runway occupancy time.
- Reduce taxiway connector widths when rehabilitation is necessary.

Landside Facilities

- Reserve the east side of the airfield for non-aviation development.
- Construct a vehicle access road between the North and South Aprons.
- Construct new hangars to accommodate forecasted growth.
- Expand vehicle parking for the North and South Aprons
- Develop ramp and facilities for firefighting operations
- Develop ramp and facilities for helicopter parking and a service area.
- Develop ramp and facilities for additional fixed base operator/aviation services.

4.4.1 ALTERNATIVE 1 – MAINTAIN 4 DEGREE PAPI

This alternative improves reliability to Runway 16/34 by maintaining the new PAPI system being installed in summer of the 2018. The 4-box PAPI will mitigate existing obstacles penetrating the Instrument Approach Procedure (IAP) 20:1 Visual Surface on Runway 34. Maintenance of the PAPI occurs by monitoring the growth of trees within the PAPI Obstacle Clearance Surface (OCS) and actively clearing trees growing near the surface.

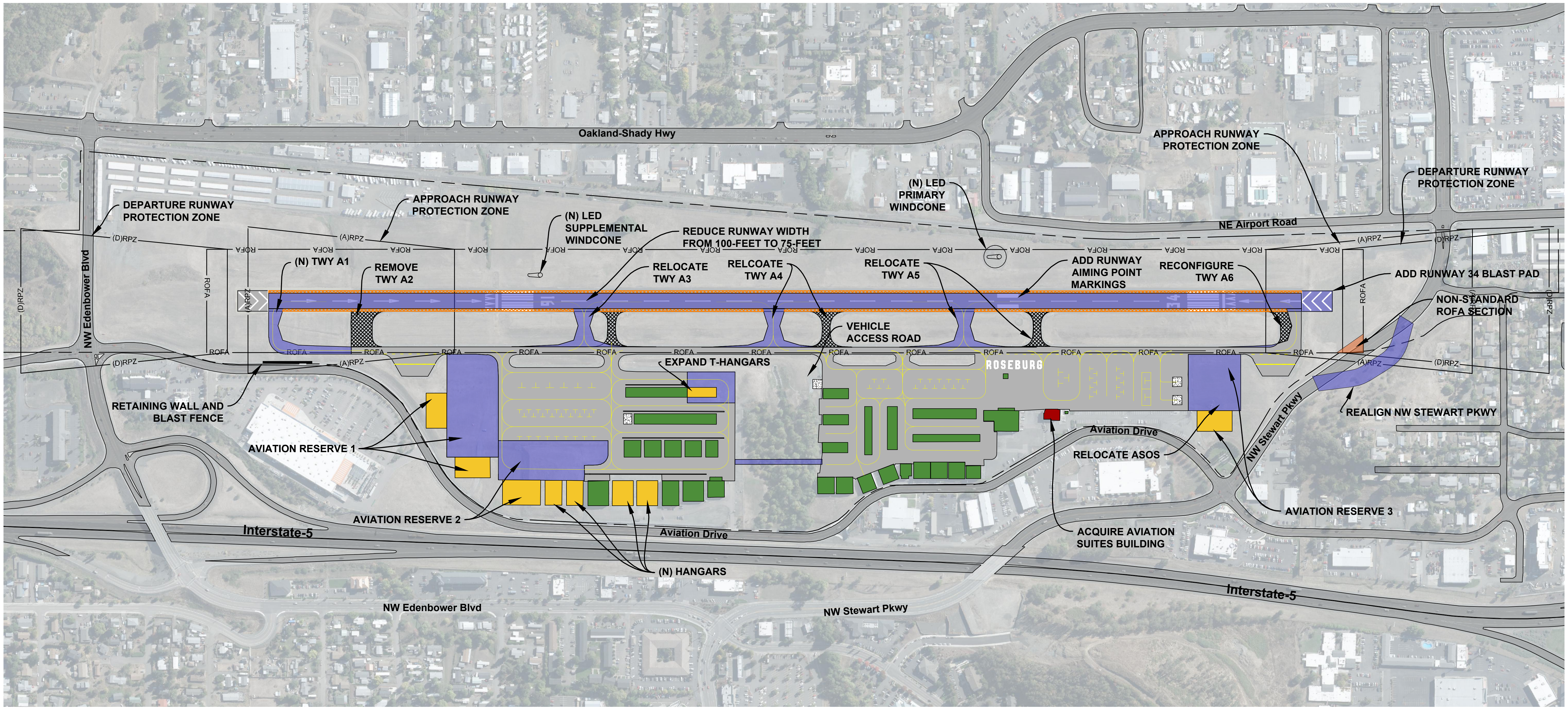
This alternative assumes the FAA would not require RPZ incompatible land use compliance to be addressed for the existing alignment of NW Edenbower Boulevard inside the Runway 16 departure RPZ, the small portion of Aviation Drive within the Runway 16 RPZ, and NW Stewart Parkway within the Runway 34 approach and departure RPZ. Because of this alternative proposes to maintain the existing location and size for the Runway 16/34 RPZs, it is not expected that FAA analysis of land uses within the RPZs is required.

Although it is the City of Roseburg's intent to make every effort to bring RBG up to current standards, this alternative assumes the Airport will receive an FAA Modification of Standards for the small 5,900-square-foot portion of Runway Object Free Area (ROFA) does not meet AC 5300-13A design standards on the Runway 34 end due to the location of NW Stewart Parkway. The City of Roseburg is planning to correct the non-standard ROFA when NW Stewart Parkway reaches the end of its useful life and will need to be constructed.

The 4-degree PAPI allows for operations of Aircraft Approach Category (AAC) types A and B; however, it does not allow for operations by AAC type C and D aircraft. The AAC of the Airport's critical design aircraft is type B. Although AAC type C and D do operate at the Airport, as found in **Chapter 2, Aviation Activity Forecasts**, they do not operate more than 500 operations per year.

While the actual construction of the proposed taxiway connectors and aviation apron development is complex, the project schedule, contractor construction and mobilization are assumed to be straightforward, and therefore, would have minimal impact to airport operation and require minimal closures to Runway 16/34.

Airport Alternative 1 is illustrated in **Figure 4-2**, and costs are summarized in **Table 4-1**.



Aviation Reserve Potential Uses:

- Dedicated Firefighting Area
- Dedicated Helicopter Parking Area
- Additional FBO/Aviation Services

0 250 500

Figure 4-2
Alternative 1 - Maintain 4 Degree PAPI

Table 4-1: Alternative 1 Estimated Costs

Airport Alternative 1 Costs	Estimated Project Cost
Parallel Taxiway A Extension	$850,000
Relocation of Taxiway Connectors	$1,940,000
Runway 34 Blast Pad	$410,000
Construct North/South Apron Vehicle Access Road	$280,000
North Apron Expansion	$1,180,000
North Apron Hangars	$4,660,000
Aviation Reserve 1 Apron	$4,170,000
Aviation Reserve 1 Hangars	$5,050,000
Aviation Reserve 2 Apron	$3,140,000
Aviation Reserve 2 Hangars	$6,200,000
Aviation Reserve 3 Apron	$2,340,000
Aviation Reserve 3 Hangars	$2,530,000
PAPI Tree Maintenance Program (20-Year Program)	$100,000
Realign NW Stewart Parkway	$3,174,000
Estimated Total Cost	**$36,024,000**

Alternative 1 Advantages

- No property acquisition is required for this alternative
- This has the lowest total cost for all five alternatives
- Airport operations will experience minimal impacts
- This alternative maximizes development of land on Airport property
- Mitigate 20:1 Surface penetrations with the use of a PAPI

Alternative 1 Disadvantages

- This alternative does not include 5,400-foot runway length identified in **Appendix F, Runway Length Study.**
- Cannot accommodate AAC C and D Aircraft.

Stakeholder Feedback

The stakeholders ranked Alternative 1 first among the five alternatives considered. Airport users acknowledged that, although an ultimate 5,400-foot runway would desirable for aircraft operations, the financial limitations of the City of Roseburg render a longer runway financially infeasible.

4.4.2 ALTERNATIVE 2 – 3.77-DEGREE PAPI

This alternative provides improved reliability to Runway 16/34 by altering the PAPI glide slope approach angle from 4 degrees to 3.77 degrees. The 4-degree PAPI allows for operations of Aircraft Approach Category (AAC) types A and B; however, it does not allow for operations by AAC type C and D aircraft. The AAC of the Airport's critical design aircraft is type B. Although AAC type C and D do operate at the Airport, as found in **Chapter 2, Aviation Activity Forecasts**, they do not operate more than 500 operations per year. This alternative explores the possibility of improving the reliability for larger (AAC C and D) jets to operate at RBG.

Like Alternative 1, this alternative assumes the FAA would not require RPZ incompatible land use compliance within the 16/34 RPZs to be addressed, and an FAA analysis of land uses within the RPZs is not expected.

Like Alternative 1, this Alternative assumes the Airport will receive an FAA Modification of Standards for the small, 5,900-square-foot portion of ROFA that is out of compliance on the Runway 34 end.

Like Alternative 1, the actual construction of the proposed taxiway connectors and aviation apron development is complex, but the project schedule, contractor construction and mobilization are assumed to be straightforward. Therefore, construction would have minimal impact to airport operation and require minimal closures to Runway 16/34.

To clear the PAPI OCS for a 3.77-degree glide slope angle, the removal of an estimated 70,000 cubic yards of terrain, 13 clusters of trees, and two power line poles is anticipated.

Airport Alternative 2 is illustrated in **Figure 4-3**, and costs are summarized in **Table 4-2**.

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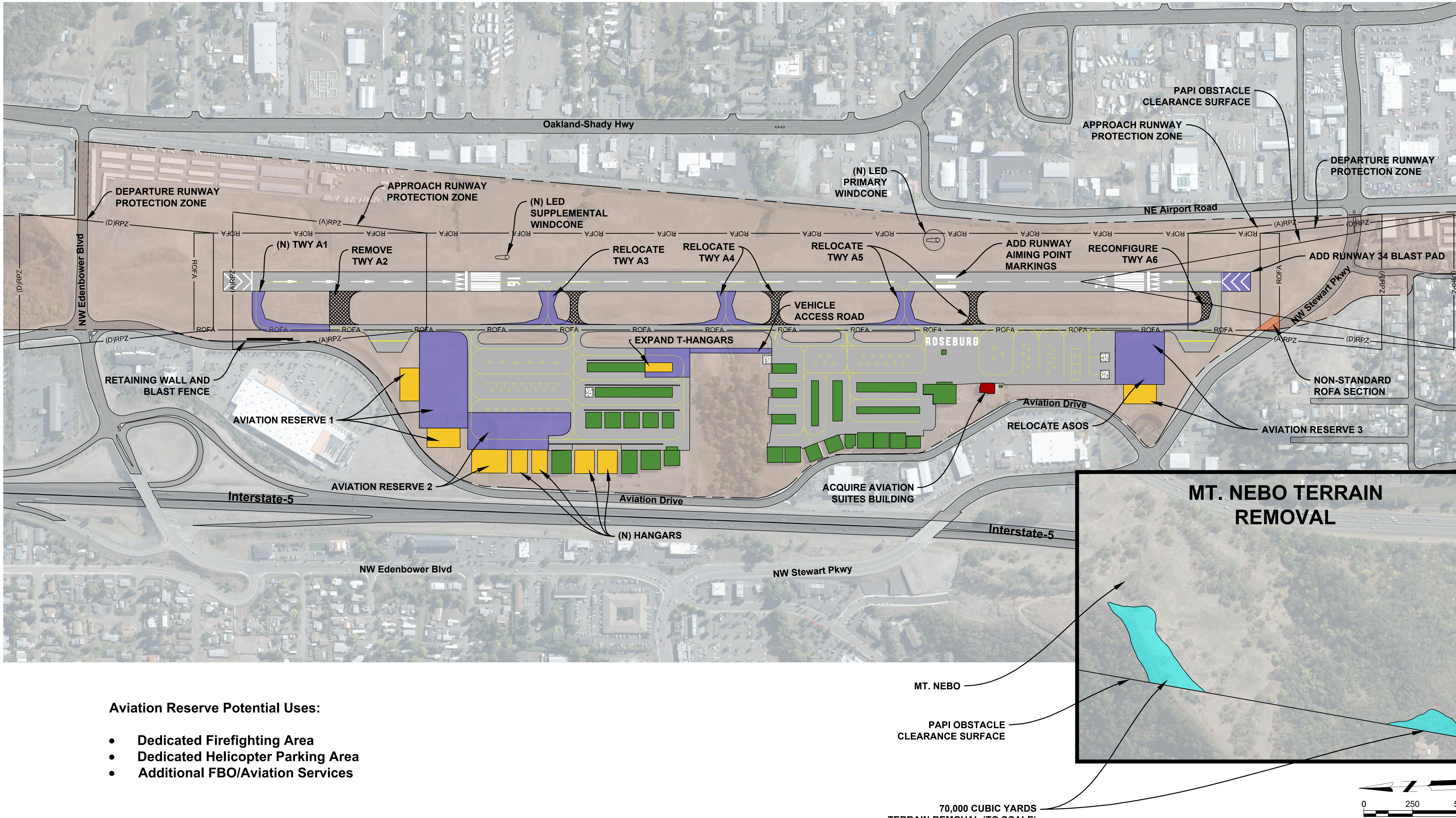


Aviation Reserve Potential Uses:

- Dedicated Firefighting Area
- Dedicated Helicopter Parking Area
- Additional FBO/Aviation Services

Figure 4-3

Alternative 2 - 3.77 Degree PAPI

Table 4-2: Alternative 2 Estimated Costs

Airport Alternative 2 Costs	Estimated Project Cost
3.77-Degree PAPI OCS Obstruction Removal	$2,840,000.00
Parallel Taxiway A Extension	$850,000.00
Relocation of Taxiway Connectors	$1,940,000.00
Runway 34 Blast Pad	$410,000.00
Construct North/South Apron Vehicle Access Road	$280,000.00
North Apron Expansion	$1,180,000.00
North Apron Hangars	$4,660,000.00
Aviation Reserve 1 Apron	$4,170,000.00
Aviation Reserve 1 Hangars	$5,050,000.00
Aviation Reserve 2 Apron	$3,140,000.00
Aviation Reserve 2 Hangars	$6,200,000.00
Aviation Reserve 3 Apron	$2,340,000.00
Aviation Reserve 3 Hangars	$2,530,000.00
PAPI Tree Maintenance Program (20-Year Program)	$100,000.00
Realign NW Stewart Parkway	$3,174,000.00
Estimated Total Cost	**$38,864,000**

Alternative 2 Advantages

- This alternative allows for reliable operations from AAC type C and D aircraft
- Improved reliability for AAC type A and B aircraft
- The total cost for this alternative is the third lowest for all five alternatives.
- Airport Operations will experience minimal impacts
- This alternative allows the Airport to maximizing development of land on Airport property
- Mitigate 20:1 Surface penetrations with the use of a PAPI

Alternative 2 Disadvantages

- Property acquisition is expected for terrain removal.
- Does not include 5,400-foot runway length identified in **Appendix F, Runway Length Study**.
- There is not an existing or forecasted operational demand for AAC type C and D aircraft to exceed 500 annual operations at the Airport.

Stakeholder Feedback

The stakeholders did not prefer Alternative 2. Airport users noted that, although the improved reliability for AAC type C and D aircraft can help a few of the aircraft that operate at the Airport.

4.4.3 ALTERNATIVE 3 – ROTATE RUNWAY 2 DEGREES

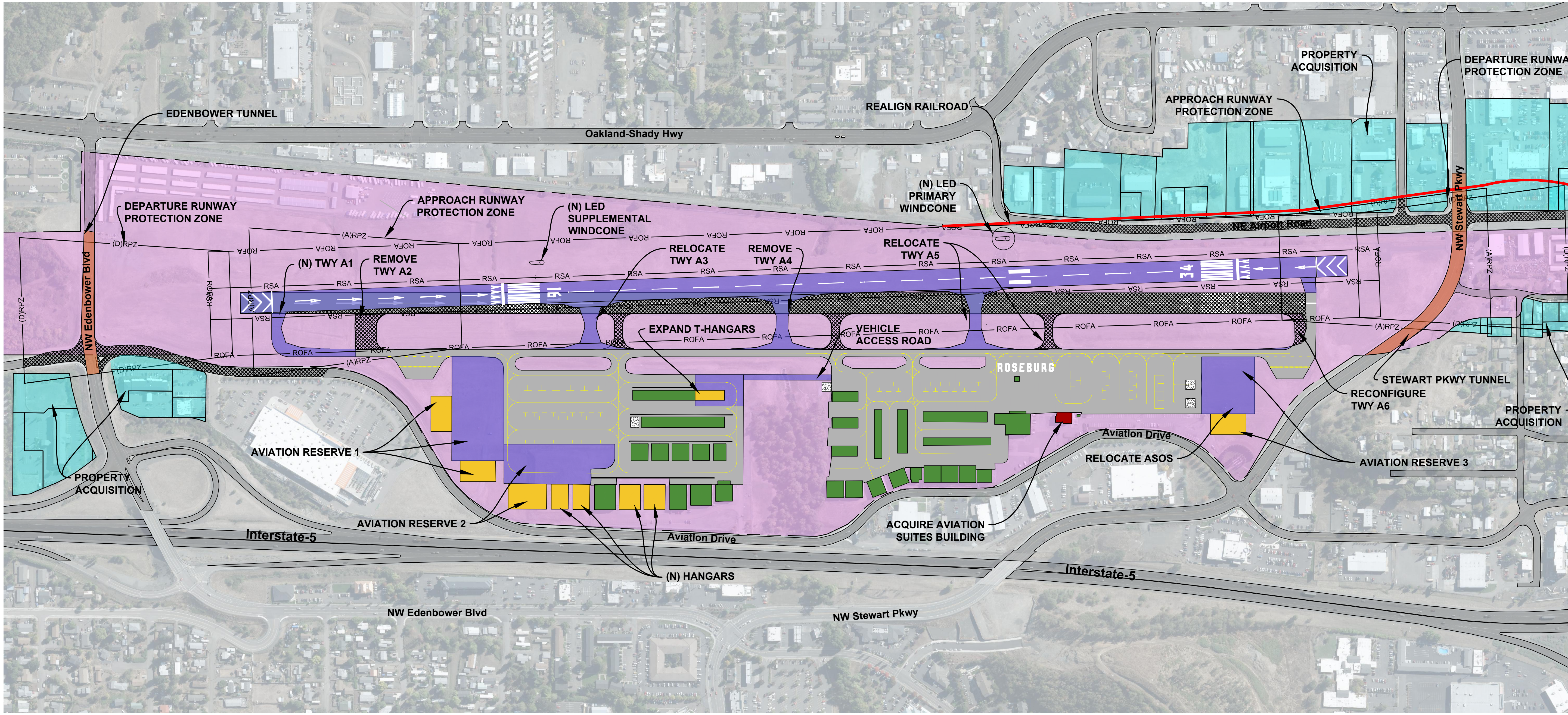
This alternative improves reliability to Runway 16/34 by rotating the runway two degrees. Terrain obstacles from Mt. Nebo currently lie within the 20:1 visual surface for Runway 34. The rotation of two degrees east is the estimated realignment required to remove all terrain-related obstacles within the 20:1 visual surface for Runway 34.

The realignment of Runway 16/34 will trigger a FAA review of incompatible land uses within the RPZs due to their new locations. It is anticipated the newly located RPZs will be required to clear all incompatible land uses. As noted in **Chapter 3, Facility Requirements**, four major roads allow for travel between the eastern and western sides of the City of Roseburg. These roads are reported to be critical for the City's traffic network. As a result, to simply remove NW Edenbower Boulevard and NW Stewart Parkway out of Runway 16/34's RPZ is not a viable option for the City. This alternative proposes tunnels for both roads to be constructed below ground to meet RPZ land use compliance. Other RPZ incompatible land use compliance that will need to be addressed includes other business, homes, and minor roads that lie within the realigned Runway 16/34 RPZs.

The realignment of Runway 16/34 requires a shift of the ROFA. The impacts of the realigned ROFA includes the Central Oregon and Pacific Railroad and NE Airport Road.

Alternative 3 has the most complex construction needs and greatest cost among all five alternatives due to the numerous roads that need to be altered, a railroad track that needs to be realigned, and grading necessary to bring the new Runway Safety Area (RSA) and ROFA into compliance. Estimates indicate the Airport will need to acquire 36 acres of land will need to accommodate Alternative 3.

Airport Alternative 3 is illustrated in **Figure 4-4**, and costs are summarized in **Table 4-3**.



Aviation Reserve Potential Uses:

- Dedicated Firefighting Area
- Dedicated Helicopter Parking Area
- Additional FBO/Aviation Services

0 250 500

Figure 4-4

Alternative 3 - Rotate Runway 2 Degrees

Table 4-3: Alternative 3 Estimated Costs

Airport Alternative 3 Costs	Estimated Project Cost
Runway 16/34 Realignment	$17,900,000.00
Property Acquisition	$64,800,000.00
Railroad Realignment	$46,600,000.00
NW Edenbower Boulevard Tunnel	$43,340,000.00
NW Stewart Parkway Tunnel	$65,350,000.00
ROFA Grading Compliance and Road Demo	$3,350,000.00
Parallel Taxiway A Extension	$860,000.00
Relocation of Taxiway Connectors	$3,190,000.00
Runway 34 Blast Pad	$410,000.00
Construct North/South Apron Vehicle Access Road	$280,000.00
North Apron Expansion	$1,180,000.00
North Apron Hangars	$4,660,000.00
Aviation Reserve 1 Apron	$4,170,000.00
Aviation Reserve 1 Hangars	$5,050,000.00
Aviation Reserve 2 Apron	$3,140,000.00
Aviation Reserve 2 Hangars	$6,200,000.00
Aviation Reserve 3 Apron	$2,340,000.00
Aviation Reserve 3 Hangars	$2,530,000.00
PAPI Tree Maintenance Program (20-Year Program)	$100,000.00
Realign NW Stewart Parkway	$3,174,000.00
Estimated Total Cost	$278,624,000

Alternative 3 Advantages

- This alternative removes all terrain obstacles from the Runway 34 20:1 visual surface.
- This alternative allows for the potential for the Runway 16/34 increase the useable runway length.

Alternative 3 Disadvantages

- This alternative anticipates significant property acquisition.
- Various businesses will need to be acquired including two hotels.
- This is the most expensive option of all five alternatives.

Stakeholder Feedback

The stakeholders did not prefer Alternative 3. Airport users noted that realigning Runway 16/34 is financially not practical when there other cost-effective solutions are available to improve the reliability of the runway.

4.4.4 ALTERNATIVE 4 – 1,522-FOOT RUNWAY 34 DISPLACED THRESHOLD

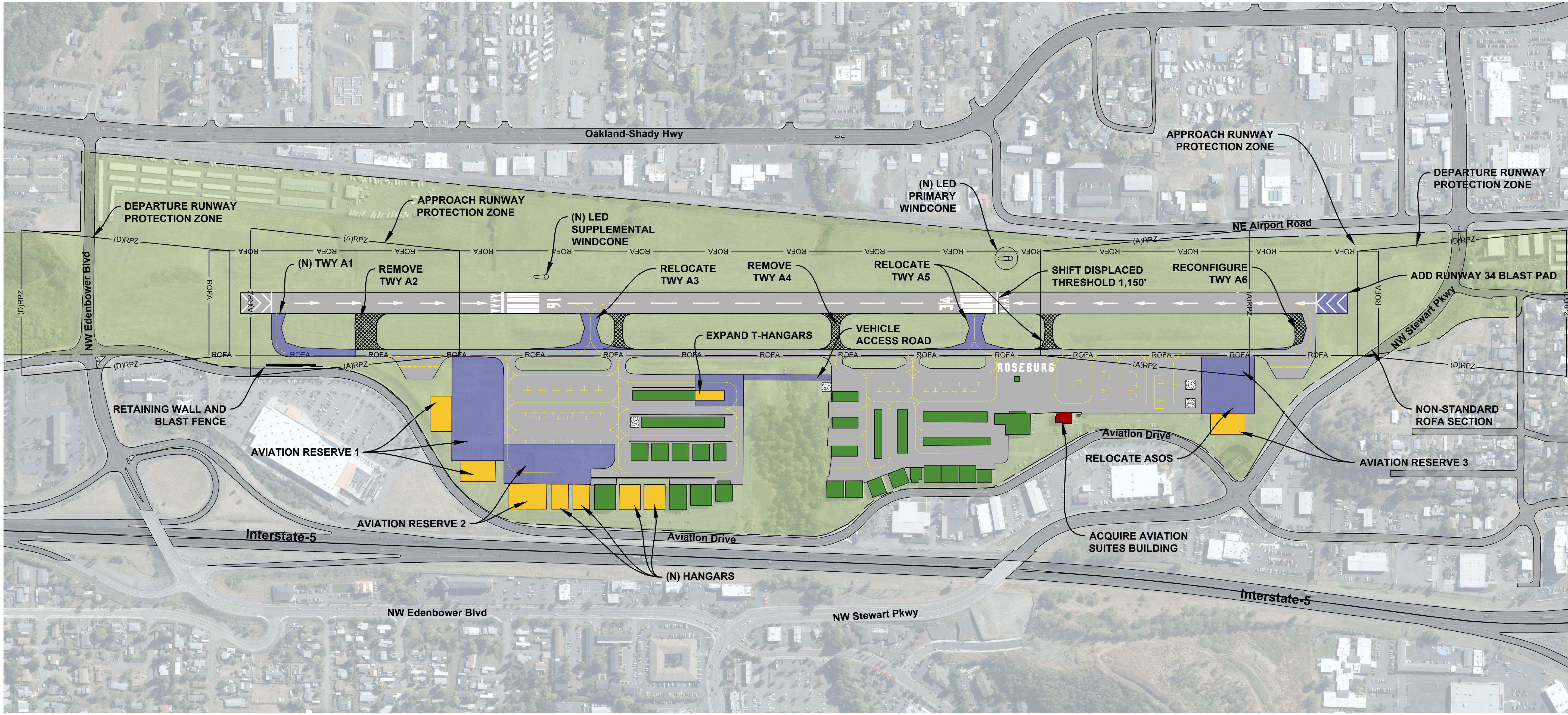
This alternative improves reliability to Runway 16/34 by shifting the Runway 34 end threshold an additional 1,150 feet to remove all terrain related obstacles within the 20:1 visual surface for Runway 34. The shift of the Runway 34 end threshold reduces the landing distance available on the Runway 34 end from 4,631 feet to 3,481 feet.

Like Alternative 1, this alternative assumes the FAA would not require RPZ incompatible land use compliance within the Runway 16/34 RPZs to be addressed. Although there are new incompatible land uses within the new 34 approach RPZ, it is assumed the FAA would allow the presence of the existing Central Oregon and Pacific Railroad for a small portion of the RPZ, and an FAA analysis of land uses within the RPZs is it is not expected.

Like Alternative 1, this alternative assumes the Airport will receive an FAA Modification of Standards for the small 5,900-square-foot portion of ROFA that is out of compliance on the Runway 34 end.

Like Alternative 1, construction is complex for the Runway 16/34 remarking, proposed taxiway connectors, and aviation apron development, but the project schedule, contractor construction and mobilization are assumed to be straightforward. Therefore, the alternative is expected to have minimal impact to airport operations and require minimal closures to Runway 16/34.

Airport Alternative 4 is illustrated in **Figure 4-5**, and costs are summarized in **Table 4-4**.



Aviation Reserve Potential Uses:

- Dedicated Firefighting Area
- Dedicated Helicopter Parking Area
- Additional FBO/Aviation Services

Figure 4-5

Alternative 4 - 1,522' Runway 34 Displaced Threshold

Table 4-4: Alternative 4 Estimated Costs

Airport Alternative 4 Costs	Estimated Project Cost
Runway Remark and PAPI Relocation	$110,000.00
Parallel Taxiway A Extension	$850,000.00
Relocation of Taxiway Connectors	$1,940,000.00
Runway 34 Blast Pad	$410,000.00
Construct North/South Apron Vehicle Access Road	$280,000.00
North Apron Expansion	$1,180,000.00
North Apron Hangars	$4,660,000.00
Aviation Reserve 1 Apron	$4,170,000.00
Aviation Reserve 1 Hangars	$5,050,000.00
Aviation Reserve 2 Apron	$3,140,000.00
Aviation Reserve 2 Hangars	$6,200,000.00
Aviation Reserve 3 Apron	$2,340,000.00
Aviation Reserve 3 Hangars	$2,530,000.00
PAPI Tree Maintenance Program (20-Year Program)	$100,000.00
Realign NW Stewart Parkway	$3,174,000.00
Estimated Total Cost	**$36,134,000**

Alternative 4 Advantages

- This alternative requires no property acquisition.
- This alternative maximizes the development of land on Airport property.

Alternative 4 Disadvantages

- The alternative significantly decreases the landing distance available for Runway 34.
- Does not include 5,400-foot runway length identified in **Appendix F, Runway Length Study**.
- The shortened runway length does not meet the needs of the critical aircraft.

Stakeholder Feedback

The stakeholders did not prefer Alternative 4. Airport users noted the reduction in landing distance available caused by the shifting the Runway 34 threshold an additional 1,150 feet would cause a significant negative impact in aircraft operations and their ability to land at the Airport.

4.4.5 ALTERNATIVE 5 – 5,400-FOOT RUNWAY

This alternative provides improved reliability to Runway 16/34 by increasing the total runway length from 5,003 feet to 5,400 feet. The 5,400-foot runway length was obtained from **Appendix F, Runway Length Study**. On Airport property, land is available for a runway extension on the Runway 16 End. However, the Taxiway A Taxiway Object Free Area (TOFA) and new ROFA would require the closure for a portion of Aviation Drive.

The extension of Runway 16 will trigger a review of incompatible land uses within the departure RPZ due to its new location. It is anticipated the newly located RPZ will be required to clear all incompatible land uses. Like Alternative 3, the four major roads that travel between the eastern and western sides of the City of Roseburg remain critical for the City's traffic network. Simply removing NW Edenbower Boulevard is not a viable option for the City. This alternative proposes a tunnel to be constructed beneath the Runway 16 departure RPZ to maintain the road. Other RPZ incompatible land use compliance that will need to be addressed includes other businesses and minor roads that lie within the realigned Runway 16 RPZs.

Alternative 5 has the second greatest complexity and cost among all five alternatives due to the RPZ shift, construction of the NW Edenbower Boulevard tunnel, Runway 16/34 extension, and grading necessary to bring the new RSA and ROFA into compliance. It is estimated seven acres of land will need to be acquired to accommodate Alternative 5.

Airport Alternative 5 is illustrated in **Figure 4-6**, and costs are summarized in **Table 4-5**.

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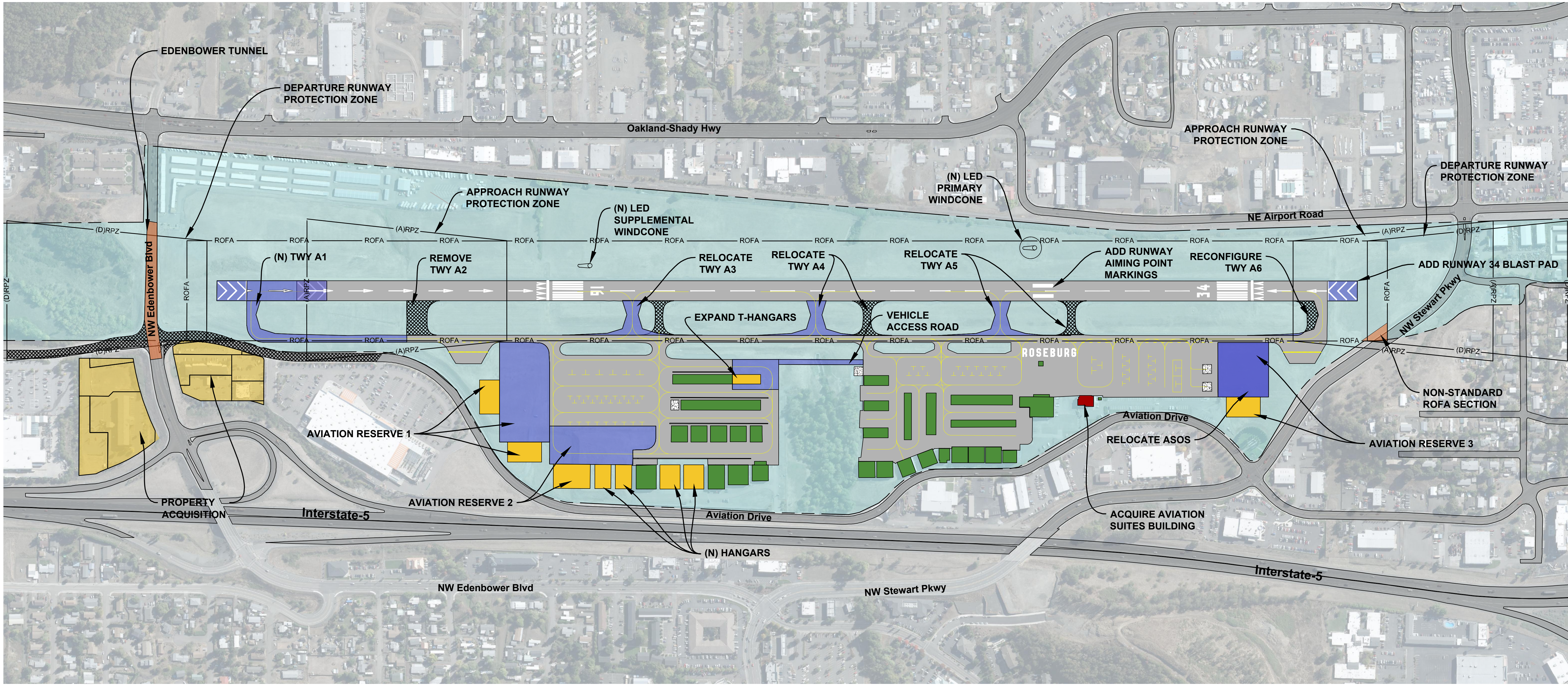

Aviation Reserve Potential Uses:

- **Dedicated Firefighting Area**
- **Dedicated Helicopter Parking Area**
- **Additional FBO/Aviation Services**

0 250 500

Figure 4-6

Alternative 5 - 5,400' Runway

Table 4-5: Alternative 5 Estimated Costs

Airport Alternative 5 Costs	Estimated Project Cost
Runway 16 Extension	$1,860,000.00
Property Acquisition	$37,800,000.00
NW Edenbower Boulevard Tunnel	$43,340,000.00
ROFA Grading Compliance and Road Demo	$340,000.00
Parallel Taxiway A Extension	$1,340,000.00
Relocation of Taxiway Connectors	$3,190,000.00
Runway 34 Blast Pad	$410,000.00
Construct North/South Apron Vehicle Access Road	$280,000.00
North Apron Expansion	$1,180,000.00
North Apron Hangars	$4,660,000.00
Aviation Reserve 1 Apron	$4,170,000.00
Aviation Reserve 1 Hangars	$5,050,000.00
Aviation Reserve 2 Apron	$3,140,000.00
Aviation Reserve 2 Hangars	$6,200,000.00
Aviation Reserve 3 Apron	$2,340,000.00
Aviation Reserve 3 Hangars	$2,530,000.00
PAPI Tree Maintenance Program (20-Year Program)	$10,000.00
Realign NW Stewart Parkway	$3,174,000.00
Estimated Total Cost	**$121,014,000**

Alternative 5 Advantages

- This alternative provides a 5,400-foot runway to allow for more efficient operations by the existing critical aircraft

Alternative 5 Disadvantages

- This alternative calls for significant property acquisition
- Various businesses will also need to be acquired including two hotels
- This alternative is the second most expensive option of all five alternatives

Stakeholder Feedback

The stakeholders ranked Alternative 5 second among the five alternatives, however it was still determined not to be preferred. Airport users noted that extending Runway 16/34 is financially not practical when there are other cost-effective solutions to improve the reliability of the runway

.

Table 4-6: Summary Evaluation Matrix of Runway Alternatives

Impact Category	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5
Description of Improvement	Maintain 4-Degree PAPI	3.77-Degree PAPI	Rotate Runway 2 Degrees	1,522-Foot Runway 34 Displaced Threshold	5,400-Foot Runway
Operational Performance					
Impact to Airport Operations	Low	Low	High	High	High
Phasing Complexity	Low	Low	High	Medium	High
Environmental Considerations					
Air Quality	None	Increased operations by larger jet aircraft may increase emissions	None		Increased operations by larger jet aircraft may increase emissions
Historical, Architectural, Archaeological, and Cultural Resources	None		Properties to be acquired are not listed in the National Register of Historic Places, however an assessment of their eligibility has not been conducted.	None	Properties to be acquired are not listed in the National Register of Historic Places, however an assessment of their eligibility has not been conducted.
Section 4(f) Property	None	Potential effects on 4(f) resources due to increased noise from larger jet aircraft	Central Oregon and Pacific Railroad	None	Potential effects on 4(f) resources due to increased noise from larger jet aircraft
Threatened and Endangered Species	There are no documented occurrences of any listed species threatened and/or endangered species for all alternatives. However, the United States Fish and Wildlife Service indicates that Kincaid's lupine may be present in the vicinity of the Airport.				
Water Quality	All alternatives would increase the amount of impervious surfaces. Depending on the amount of impervious surface and proposed stormwater treatment, the Stormwater Pollution Control Plan (SWPCP) may need to be modified.				
Wetlands	All alternatives may impact wetlands. Proposed development areas contain previously delineated wetlands. A wetland delineation study would be needed to assess wetland and water body impacts.				
Farmland	None				
Floodplains	None		Necessitates changes to upstream end of the Newton Creek culvert; Impacts the Newton Creek floodplain.	None	
Stakeholder Feedback					
On/Off Airport Related Impacts	Low	Medium	High	High	High
Project Risk	Low	Medium	High	Low	High
Implementation Complexity	Low	Medium	High	Low	High
Financial Feasibility					
Project Cost	$36,024,000	$38,864,000	$278,624,000	$36,134,000	$121,014,000
Alternative Evaluation					
Determination	**Favorable**	**Neutral**	**Not Favorable**	**Not Favorable**	**Not Favorable**

4.6 PREFERRED AIRPORT ALTERNATIVE

Table 4-6 above summarizes the five airport alternatives. Alternative 1 maintains the existing Runway 16/34 runway thresholds, removes back-taxi operations on Runway 16/34 by extending Taxiway A, implements improvements to Taxiway A by removing direct access from aprons, and maximizes development on Airport property without the need to purchase additional land. Alternative 2 requires a significant terrain removal effort in order to allow for AAC C and D aircraft to operate at the Airport at night. The ability for AAC C and D type aircraft to land at the Airport is desirable to attract new airport users. However, due to the minimal number of C and D aircraft that currently use the Airport during daytime operations, it is unlikely that the improved PAPI glide slope angle will have a significant impact on the number of operations by larger jet aircraft. Alternative 3 requires the realignment of Runway 16/34 to avoid terrain obstacles. Although there is the potential of improving the runway declared distances from Alternative 3, the complications regarding clearing both Runway RPZs, purchasing 36 acres of land that are primarily used for businesses, and realigning an existing railroad makes the alternative unfeasible. Alternative 4 has the second lowest cost amongst all alternatives, yet the negative impacts to aircraft operations by decreasing the LDA for Runway 34 is not a viable option for the Airport. Alternative 5 implements a 5,400 foot runway which is preferred by the pilot community, however given the space constraints at RBG the alternative was dismissed by airport stakeholders.

Alterative 1 causes the least impact to on-airport and off-airport property while maintaining the existing runway length and thresholds and meeting design standards for B-II aircraft. Based on input from the City of Roseburg and airport stakeholders, **Alterative 1 is the preferred alternative**.

The Airport layout depicted in Alterative 1 is used to evaluate subsequent improvement alternatives.

FINANCIAL FEASIBLITY

CH. 5

ROSEBURG REGIONAL AIRPORT
CHAPTER 5: FINANCIAL FEASIBLITY

CHAPTER OVERVIEW

This chapter outlines the 20-year Capital Improvement Plan (CIP) for the Roseburg Regional Airport (RBG or the Airport). The CIP is a year-by-year strategic plan for development and implementation of facilities at the Airport as recommended in **Chapter 3, Facility Requirements** and **Chapter 4, Improvement Alternatives**. The CIP is developed according to federal and state grant program requirements and is sequenced with the City of Roseburg's (the City) ability to fund the projects.

The CIP does not require the Airport to build anything and does not require the Federal Aviation Administration (FAA) or the Oregon Department of Aviation (ODA) to fund projects identified in this Master Plan. The Financially Feasibility chapter is presented in the following sections:

- Approach to Capital Planning
- Sources of Funding
- Capital Improvement Plan
- Financial Feasibility Summary

Capital Improvement Plan (CIP):
An individual airport sponsor's plan for the capital needs of the airport, typically including their planned capital funding sources.

Airport Improvement Program (AIP):
A program authorized by the Airport and Airway Improvement Act of 1982 that provides funding for airport planning and development.

Airport Capital Improvement Program (ACIP):
The planning program used by the Federal Aviation Administration to identify, prioritize, and distribute funds for airport development and the needs of the National Airspace Systems to meet specified national goals and objectives.

National Plan of Integrated Airport Systems (NPIAS)
The national airport system plan developed by the Secretary of Transportation on a biannual basis for the development of public use airports to meet national air transportation needs.

5.1 APPROACH TO CAPITAL PLANNING

5.1.1 PROJECT PHASING

The CIP identifies individual projects, costs, and anticipated funding participation from the FAA and ODA phased within the near-term (1-5 years), mid-term (6-10 years), and long-term (11-20 years) planning periods. The sequence of CIP projects is based on needs identified in **Chapter 2, Aviation Activity Forecast,** and **Chapter 3, Facility Requirements**. Additionally, these considerations below influenced project priority:

- Projects that enhance efficiency and meet FAA design standards
- Projects that repair or upgrade facilities and address deficiencies
- Projects that meet user demand and delivered level of service
- Projects that support long-term Airport development goals

5.1.2 PROJECT COSTS ESTIMATES

Professional engineers and architects assisted in the development of the cost estimates for each project contained in the CIP. All project costs reflect evaluations based on the value of the dollar in 2018. The planning team and RBG used historical costs of past projects at RBG and at nearby airports similar to those identified in the CIP. For projects not occurring in 2018, estimates reflect an annual inflation rate of 3 percent. Additionally, unless noted otherwise, project estimates include a 15 percent contingency to the total project cost to account for design and construction unknowns. Project cost estimates include the cost for environmental assessment, design, construction, and construction management where appropriate.

5.2 SOURCES OF FUNDING

Airport development projects can be financed from various sources, including federal and state grants, private financing, airport revenue, bonds, and local funds. The CIP identifies funding classified into one of these two categories for each project:

- Federal funding – FAA Airport Improvement Program (AIP)
- Local funds (ODA grants, Airport revenue, bonds)

5.2.1 FEDERAL AVIATION ADMINISTRATION - AIRPORT IMPROVEMENT PROGRAM

The FAA AIP provides grants for the planning and development of eligible projects at public-use airports included in *the National Plan of Integrated Airport Systems* (NPIAS).

TABLE 5-1: EXAMPLES OF ELIGIBLE VERSUS INELIGIBLE AIP PROJECTS

Eligible Projects	Ineligible Projects
Runway, Taxiway, Apron Construction/Rehabilitation	Maintenance equipment and vehicles
Airfield Lighting and Signage	Office and office equipment
Airfield Drainage	Fuel farms[1]
Land Acquisition	Landscaping
Weather Observation Stations (AWOS)	Artworks
Navigational Aids	Aircraft Hangars[1]
Planning and Environmental Studies	Industrial park development
Safety Area Improvements	Marketing plans
Airport Layout Plans (ALPs)	Training
Access Roads only located on airport property	Improvements for commercial enterprises
Removing, lowering, moving, marking, and lighting hazards	Maintenance or repairs of buildings

1: May be conditionally eligible at non-primary airports such as RBG

Source: *https://www.faa.gov/airports/aip/overview/*, September 2018

Table 5-1 above lists examples of eligible versus ineligible AIP projects. Eligible projects include improvements to enhancing airport safety, capacity, security, and environmental concerns. The FAA NPIAS identifies nearly 3,400 existing and proposed airports that are significant to national air transportation and the needs of civil aviation, national defense, and the United States Postal Service. The NPIAS identifies airports eligible to receive federal grants under the AIP and estimates the amount of funds needed for projects. The NPIAS defines RBG as a non-primary regional airport, meaning it supports regional economies by connecting communities to statewide and interstate markets.

The funding source for AIP grants is the Aviation Trust Fund (ATF), which is financed by aviation system user fees and taxes (e.g., airline passenger tax, aircraft parts taxes, aircraft fuel taxes, and aircraft registration fees). The AIP is the mechanism to reinvest the ATF at eligible airports. FAA Order 5100.38D, *Airport Improvement Program Handbook* (*AIP Handbook*) describes AIP funding eligibility. The AIP program requires that RBG contribute a local match of 10 percent for grants received. FAA AIP funds are classified as either entitlement or discretionary.

FAA AIP Non-Primary Entitlements

Non-primary entitlement funds are for general aviation airports listed in latest published NPIAS that show needed airfield development. General aviation airports, such as RBG, with an identified need are eligible to receive $150,000 annually. Non-primary entitlement is available to use in the fiscal year it becomes available and the following three fiscal years. Airport sponsors may choose to delay using their entitlement the first, second, or third year and use all of the money in the final year in order to fund a larger project. Unused funds expire after four years unless the sponsor obligates the funds under a grant or transfers the funds to another NPIAS airport.

FAA AIP Discretionary Fund

The FAA distributes the AIP funds to projects that are national priorities and meet current objectives. Projects that rate with a high priority will receive higher consideration for funding than projects that have a lower priority ranking. Each FAA fiscal year, the FAA apportions AIP funds into four entitlement categories: passenger enplanements, cargo entitlement, non-primary entitlement, and state apportionment funds.

The remaining funds are set aside to the FAA discretionary fund. The FAA distributes discretionary funds to projects that best carry out the purpose of the AIP. Each project receives a priority ranking based on safety, security, reconstruction, capacity, and standards . The *AIP Handbook* defines the ranking priority and calculation.

AIP eligible projects at RBG may receive discretionary funding if the total cost of the project exceeds what can be covered by non-primary entitlement funds. However, discretionary funds are not guaranteed, and the project will have to compete with other airports for funding.

5.2.2 LOCAL FUNDS

Airport operations typically generate sufficient funds to pay for the costs of day-to-day operations. Airport revenue comes from various sources including leases for t-hangars, corporate hangar land leases, the Fixed Based Operator (FBO) maintenance hangar lease, the Learjet hangar lease, and non-aviation land leases from the mini-storage area. In total, current sources generate revenues of approximately $255,000 annually. The Airport fund currently has a budget of $175,000 to pay for all utilities and insurance related to the Airport, building maintenance, ground maintenance, general maintenance, City management services for the Airport, Public Works Services, and legal and audit services. The current positive operation revenue for the Airport is nearly $80,000 annually. Airport generated revenue is typically not enough to cover the 10-percent match on most AIP-eligible projects. The Airport uses local funds to provide the 10-percent match on AIP-eligible projects and for projects that are ineligible. Local funds include, but are not limited to, the City of Roseburg general fund and economic development fund.

5.3 CAPITAL IMPROVEMENT PLAN

The Airport completed its most recent CIP update in February 2018. This update covers projects from fiscal year (FY) 2019 to FY 2023. RBG, the planning team and the FAA Seattle Airports Districts Office (ADO) reviewed this CIP. Following review, the FAA prefers that the next three years of CIP projects remain unchanged due to the allocation of funds for all NPIAS airports. Therefore, near-term projects in the CIP have not changed significantly prior to 2021. The CIP update as part of this Master Plan focuses on projects occurring beyond FY 2021.

TABLE 5-2: Summary of RBG 20 Year Capital Improvement Plan

Period	Years	Project Costs	Entitlement	Discretionary	Local
Near-Term	2019-2023	$1,255,556	$770,000	$360,000	$125,556
Mid-Term	2024-2028	$7,304,000	$640,000	$5,933,600	$730,400
Long-Term	2029-2038	$30,426,444	$1,740,000	$25,643,800	$3,042,644
CIP	**2029-2038**	**$38,986,000**	**$3,150,000**	**$31,937,400**	**$3,898,600**

Table 5-2 above includes a summary of the 20-year CIP. The summary does not include projects ineligible for AIP funding. Additionally, the CIP summary excludes ODA grants due to unknown of availability for state funding. AIP discretionary funding can be variable, and projects included in this CIP may need to be advanced, delayed, or phased over multiple years depending on funding availability. The components of each period for the CIP is described in the following sections.

- Near-Term CIP (FY 2019 – FY 2023)
- Mid-Term CIP (FY 2024 – FY 2028)
- Long-Term CIP (FY 2029 – FY 2038)

5.3.1 NEAR-TERM CIP (FY 2019 – FY 2023)

The near-term CIP includes the construction of extension of Taxiway A to make it fully parallel to Runway 16/34, rehabilitation of the lights on Runway 16/34, and an environmental assessment of the projects highlighted in this Master Plan. **Table 5-3** below shows funding sources and values for the near-term CIP. **Figure 5-1** shows the project locations.

TABLE 5-3: Summary of RBG Near-Term Capital Improvement Plan (FY 2019 – FY 2023)

Year	Project	Entitlement	Discretionary	Local	Total
2019	Rehabilitate Runway Lighting Design & Construction	$300,000	$360,000	$73,333	$733,333
2020	Pavement Management Program (PMP)	$20,000	$0	$2,222	$22,222
2021	Environmental Assessment (ALP)	$280,000	$0	$31,111	$311,111
2022	Carryover	$0	$0	$0	$0
2023	Taxiway A Extension Design	$150,000	$0	$16,667	$166,667
	PMP	$20,000	$0	$2,222	$22,222
Near-Term CIP Total		**$770,000**	**$360,000**	**$125,556**	**$1,255,556**

2019 Projects

During the lighting rehabilitation project that is first in line, the Airport plans to upgrade the aging electrical system and lights on Runway 16/34. At the same time, the project will install a new LED supplemental windcone, a new LED primary windcone with segmented circle, and aiming point markings for Runway 16/34. The project is expected to cost a total of $733,333 and will be funded by $300,000 in AIP entitlement funding, $360,000 discretionary funding, and $73,333 of local funding.

2020 Projects

No environmental, design, or construction projects are planned for 2020. The Airport will use $20,000 of its entitlement funding towards maintaining the existing pavement and will carry over $130,000 in entitlement funding for the following year.

2021 Projects

The environmental assessment completed in September 2011 led to a Finding of No Significant Impact (FONSI) issued in September 2011 for the parallel taxiway relocation and runway extension project. Because of how much time has elapsed since the FONSI was issued, it is anticipated that a new environmental assessment is needed to cover the projects highlighted in this Master Plan.

2022 Projects

No environmental, design, or construction projects are planned for 2022. The Airport will carryover $150,000 in entitlement funding for the following year.

2023 Projects

Funding constraints and prior eligibility issues prevented completion of the last 400 feet of Taxiway A to match the runway extension on Runway 16 when the taxiway was relocated. As a result of the lack of a full parallel taxiway, pilots must perform back-taxi operations on Runway 16, which is a safety concern. The extension of Taxiway A will provide a full parallel taxiway to Runway 16/34 and remove back-taxi operations. The design for the project is expected to cost $166,667 and will be funded by $150,000 in entitlement funding and $16,667 in local funding. Additionally, the Airport will use $20,000 of its entitlement funding towards maintaining the existing pavement. The Airport will carryover $130,000 in entitlement funding for the following year.

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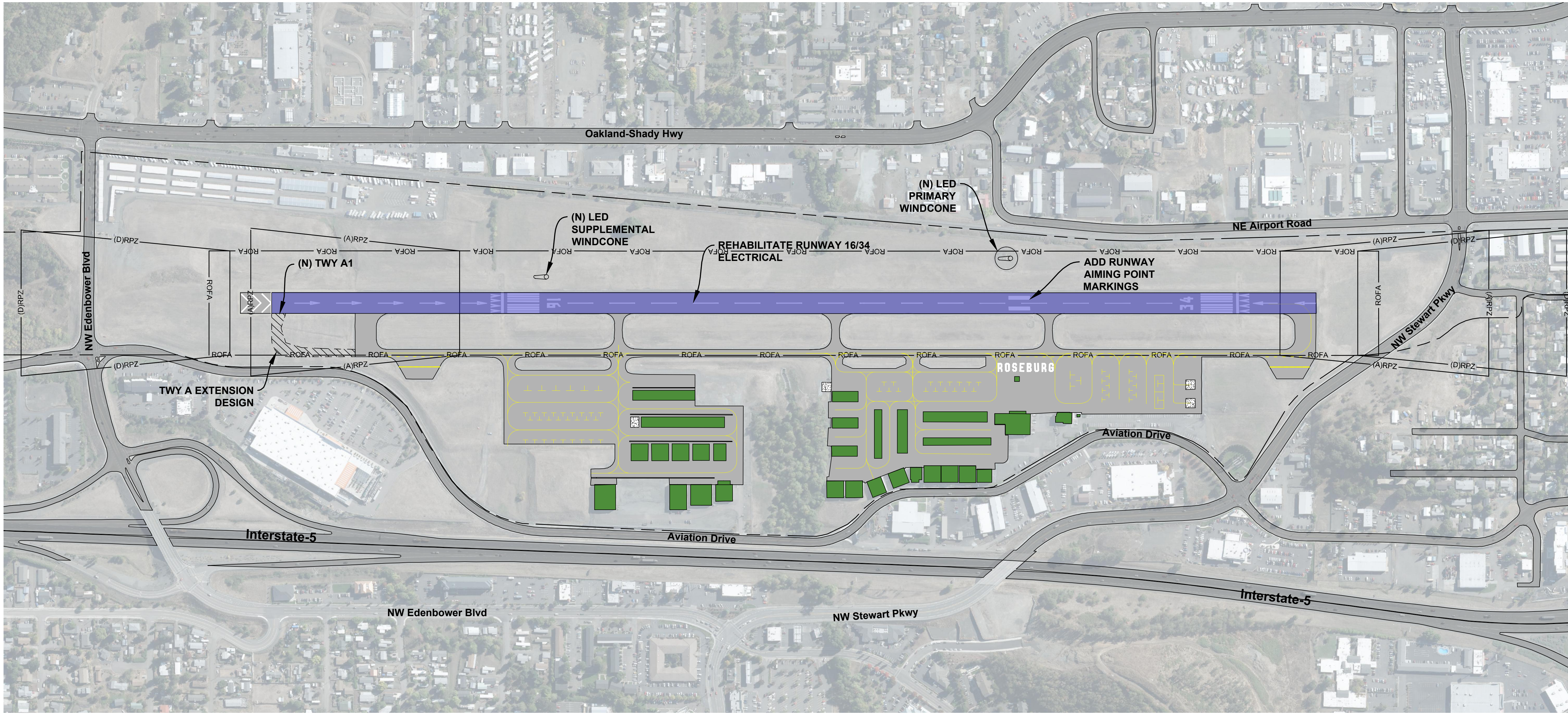

CIP Projects

Figure 5-1
Near-Term (2019-2023) CIP Projects

5.3.2 MID-TERM CIP (FY 2024 – FY 2028)

The mid-term CIP includes the construction of the Aviation Reserve 1 Apron, a blast pad on Runway 34, and an access road to connect the North and South aprons. **Table 5-4** below shows funding sources and values for the mid-term CIP. **Figure 5-2** shows the project locations.

TABLE 5-4: Summary of RBG Mid-Term Capital Improvement Plan (FY 2024 – FY 2028)

Year	Project	Entitlement	Discretionary	Local	Total
2024	Taxiway A Extension	$255,000	$960,000	$135,000	$1,350,000
2024	PAPI Tree Maintenance Program	$25,000	$0	$2,778	$27,778
2025	Aviation Reserve 1 Apron	$150,000	$4,466,100	$512,900	$5,129,000
2026	Runway 34 Blast Pad	$130,000	$239,000	$41,000	$410,000
2026	PMP	$20,000	$0	$2,222	$22,222
2027	North/South Apron Vehicle Access Road	$60,000	$268,500	$36,500	$365,000
2028	Carryover	$0	$0	$0	$0
Near-Term CIP Total		**$640,000**	**$5,933,600**	**$730,400**	**$7,304,000**

2024 Projects

The construction of Taxiway A is expected to cost $1,350,000 and will be funded by $255,000 in entitlement funding, $960,000 in discretionary funding, and $135,000 in local funding. Additionally, the Airport will use $25,000 of entitlement funding towards the management of potential tree obstacles for the Runway 34 Precision Approach Path Indicator (PAPI).

2025 Projects

Due to an unexpected increase in forest fires in recent years in Southern Oregon, the Douglas Fire Protection Agency (DFPA) has used RBG as a Single Engine Air Tanker (SEAT) base. On the airfield there is no existing space for SEAT aircraft to conduct peak operations in the summer. The construction of the Aviation Reserve 1 apron will allow enough space to accommodate the peak summer traffic. The project is expected to cost a total of $5,129,000 and will be funded by $150,000 in AIP entitlement funding, $4,466,000 in discretionary funding, and $512,900 of local funding.

2026 Projects

A blast pad will be constructed on the Runway 34 end to prevent the erosion effects of jet blast in the safety area. The project is expected to cost a total of $410,000 and will be funded by $130,000 in AIP entitlement funding, $239,000 in discretionary funding, and $41,000 of local funding. The Airport will use $20,000 of its entitlement funding towards maintaining the existing pavement

2027 Projects

Currently, tenants do not have vehicle access to the north and south aprons without exiting and reentering the Airport. The construction of an access road between the north and south aprons will allow users to travel between the two aprons more efficiently. The project is expected to cost a total of $365,000 and will be funded by $60,000 in AIP entitlement funding, $268,500 in discretionary funding, and $36,500 of local funding. The Airport will carryover $90,000 in entitlement funding for the following year.

2028 Projects

No environmental, design, or construction projects are planned for 2022. The Airport will carryover $240,000 in entitlement funding for the following year.

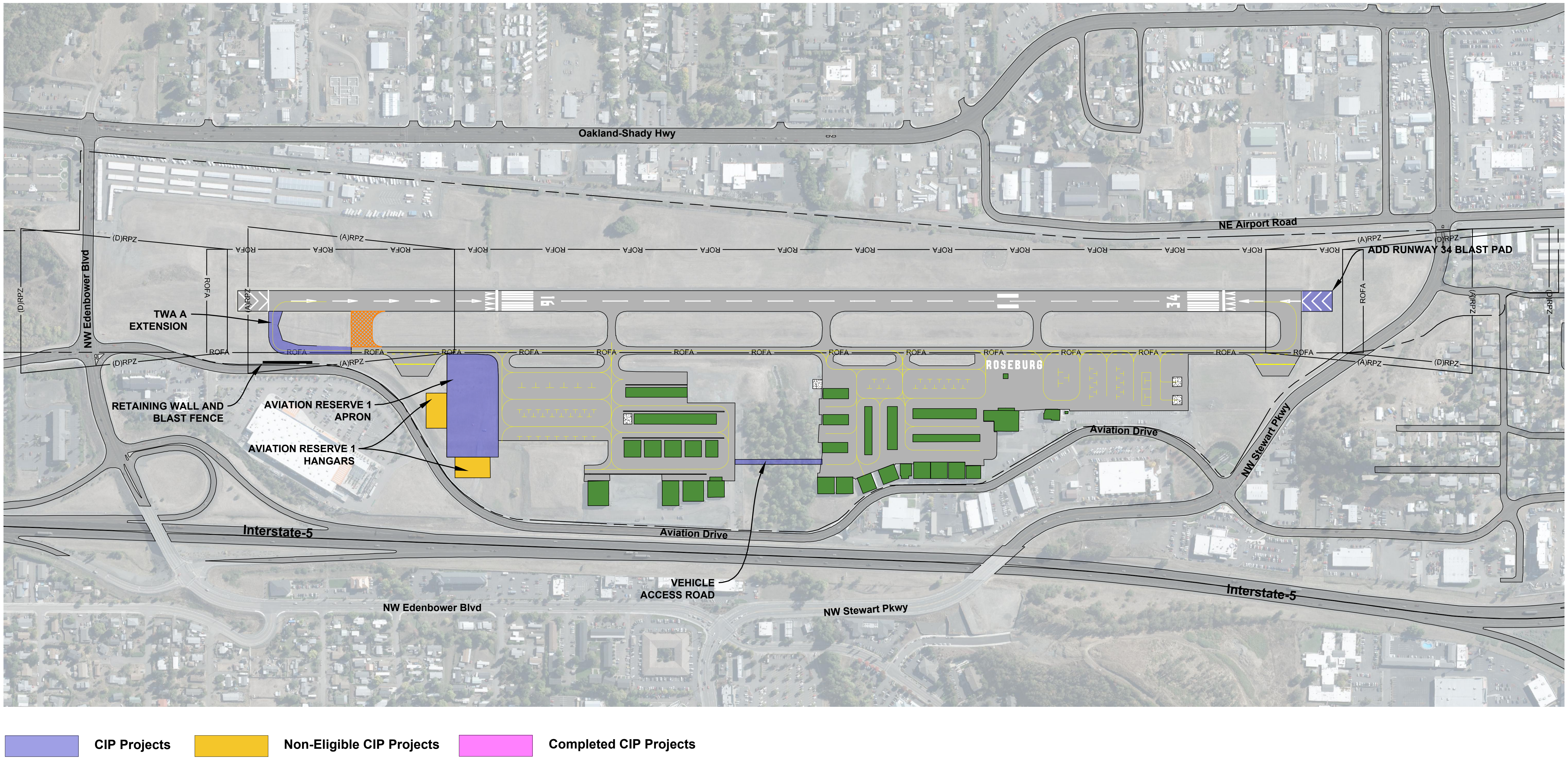

Figure 5-2
Mid-Term (2024-2028) CIP Projects

5.3.2 LONG-TERM CIP (FY 2029 – FY 2038)

The long-term CIP includes the construction of the Aviation Reserve 2 and 3 Aprons, the relocation of the taxiway connectors along Taxiway A, a realignment of NW Stewart Parkway, an expansion of the North apron, an update to the master plan and a new environmental assessment. **Table 5-5** below shows the long-term CIP prioritized projects with estimated costs and funding sources. **Figure 5-3** shows the project locations.

TABLE 5-5: Summary of RBG Long-Term Capital Improvement Plan (FY 2029 – FY 2038)

Year	Project	Entitlement	Discretionary	Local	Total
2029	Master Plan update	$150,000	$472,800	$69,200	$692,000
	PAPI Tree Maintenance Program	$25,000	$0	$2,778	$27,778
	PMP	$20,000	$0	$2,222	$22,222
2030	Environmental Assessment	$150,000	$120,000	$30,000	$300,000
2031	Aviation Reserve 2 Apron	$195,000	$3,954,900	$461,100	$4,611,000
	South Apron Rehabilitation	$150,000	$3,286,200	$381,800	$3,818,000
2032	PMP	$20,000	$0	$2,222	$22,222
2033	Aviation Reserve 3 Apron	$255,000	$4,147,800	$489,200	$4,892,000
2034	PAPI Tree Maintenance Program	$25,000	$0	$2,778	$27,778
2035	Relocation of Taxiway Connectors	$280,000	$4,465,700	$527,300	$5,273,000
	PMP	$20,000	$0	$2,222	$22,222
2036	Runway 16/34 Rehabilitation	$150,000	$2,454,600	$289,400	$2,894,000
2037	North Apron Expansion	$150,000	$1,712,100	$206,900	$2,069,000
2038	Realign NW Stewart Parkway	$130,000	$5,029,700	$573,300	$5,733,000
	PMP	$20,000	$0	$2,222	$22,222
Long-Term CIP Total		**$1,740,000**	**$25,643,800**	**$3,042,644**	**$30,426,444**

2029 Projects

An update to the Master Plan that will likely revisit the need for the runway extension and determine if additional automobile parking is needed. The master plan update will review and plan implementation of the long-term projects highlighted in this CIP. The Airport will use $25,000 of entitlement funding towards the management of potential tree obstacles for the Runway 34 Precision Approach Path

Indicator (PAPI). The Airport will use $20,000 of its entitlement funding towards maintaining the existing pavement. The Airport will carry over $195,000 in entitlement funding for the following year.

2030 Projects

An environmental assessment will be completed as it is anticipated that a new environmental assessment is needed due to the time that has elapsed since the last FONSI was issued and is needed to cover the projects highlighted in the 2029 master plan update. The Airport will carry over $195,000 in entitlement funding for the following year.

2031 Projects

Because the Airport continues to experience growth in based aircraft, the forecasts indicate a future need for more apron and hangar space. The construction of Aviation Reserve Apron 2 will provide sufficient space on the airfield to help meet the forecasted demand. The project is expected to cost a total of $4,611,00 and will be funded by $195,000 in AIP entitlement funding, $3,954,900 in discretionary funding, and $461,100 of local funding. Additionally, based on the Pavement Evaluation/Maintenance Management Program performed by ODA, it is expected the South Apron at the Airport will need to be rehabilitated. The project cost is expected to cost a total of $3,818,000 and will be funded by $150,000 in AIP entitlement funding, $3,286,200 in discretionary funding, and $381,800 of local funding.

2032 Projects

The Airport will split its entitlement funding with $20,000 going towards maintaining the existing pavement and carrying over $130,000 for the following year.

2033 Projects

Because the Airport continues to experience growth in helicopter operations, forecasts indicate a future need for more helicopter parking space. The construction of Aviation Reserve Apron 3 will provide a dedicated space on the airfield for helicopter operations. The project is expected to cost a total of $4,892,000 and will be funded by $255,000 in AIP entitlement funding, $4,147,800 in discretionary funding, and $489,200 of local funding. The Airport will carryover $25,000 in entitlement funding for the following year.

2034 Projects

The Airport will use $25,000 of its entitlement funding to manage potential tree obstacles for the Runway 34 PAPI. The Airport will carry over $150,000 in entitlement funding for the following year.

2035 Projects

The existing Taxiway A3, A4, and A5 connectors allow for aircraft to have direct access from the aprons on the airfield to Runway 16/34. In addition to this safety hazard, by 2035, the pavements for Taxiways A3, A4, and A5 will need significant rehabilitation. Relocation of the taxiway connectors will remove the direct access hazard. The project is expected to cost a total of $5,273,000 and will be funded by $280,000 in AIP entitlement funding, $4,465,700 in discretionary funding, and $527,100 of local funding. Additionally, the Airport will use $20,000 towards maintaining the existing pavement.

2036 Projects

Based on the Pavement Evaluation/Maintenance Management Program performed by ODA, it is expected Runway 16/34 at the Airport will need to be rehabilitated. The project cost is expected to cost a total of $2,894,000 and will be funded by $150,000 in AIP entitlement funding, $2,454,600 in discretionary funding, and $289,400 of local funding.

2037 Projects

Because the Airport continues to experience growth in based aircraft, forecasts indicate a future need for more apron and hangar space. The construction of the North Apron Expansion will provide sufficient space on the airfield to help meet the forecasted demand. The project is expected to cost a total of $2,069,000 and will be funded by $150,000 in AIP entitlement funding, $1,712,100 in discretionary funding, and $206,900 of local funding.

2038 Projects

In 2038, realigning NW Stewart Parkway will allow Runway 16/34 to meet FAA design standards. The project is expected to cost a total of $5,733,000 and will be funded by $130,000 in AIP entitlement funding, $5,029,700 in discretionary funding, and $573,300 of local funding. Additionally, the Airport will use $20,000 towards maintaining the existing pavement.

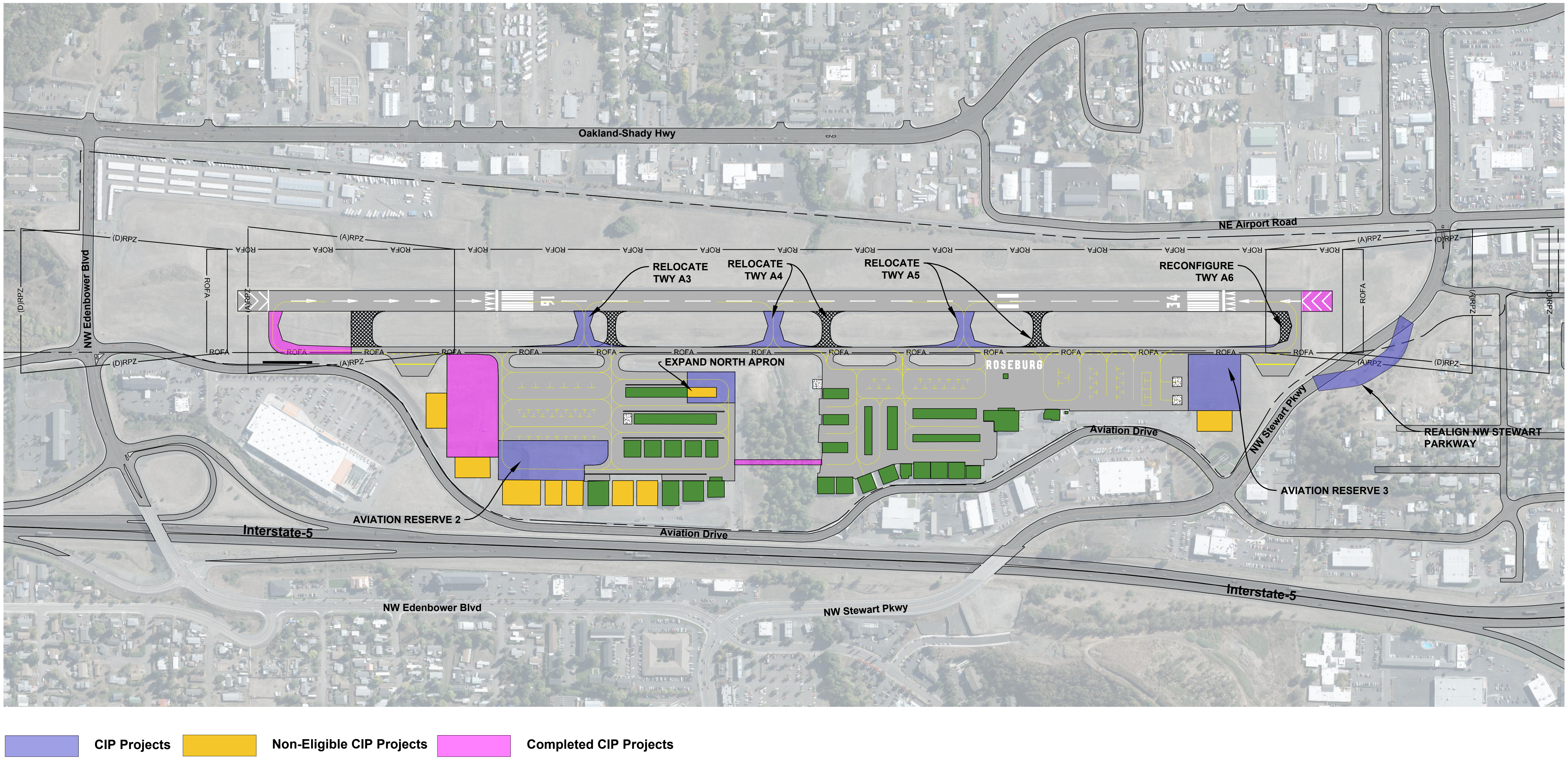

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Figure 5-3

Long-Term (2029-2038) CIP Projects

5.3 FINANCIAL FEASIBILITY SUMMARY

The 20-year CIP provides a flexible year-by-year strategic plan for the Airport to meet near-term, mid-term, and long-term project goals. The projects identified in this CIP have been distributed across 20 years to reflect airport needs and to distribute costs.

The near-term, five-year (FY 2019 – 2023) will help the Airport by addressing important projects such as the Runway Lighting Rehabilitation and the extension of Taxiway A to create a full-parallel taxiway to Runway 16/34, and setup the Airport for future projects by completing an environmental assessment.

The mid-term (FY 2024 – 2028) CIP projects include the construction of the Aviation Reserve 1 Apron, the Runway 34 Blast Pad and the on-Airport North/South Apron Vehicle Access road.

The Long-term (FY 2029-2038) CIP projects consist of large-scale projects including the Relocation of the Taxiway Connectors, and the expansion of the North Apron and the construction of Aviation Reserve Aprons 2 and 3 to meet demand. Additionally, the realignment of NW Stewart Parkway will bring the ROFA into FAA compliance.

APPENDIX

APPENDIX A:

AIRPORT LAYOUT PLAN

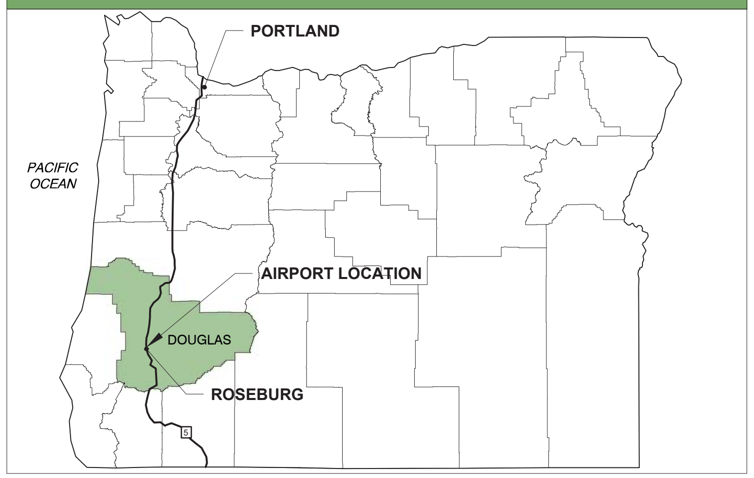
Roseburg Regional Airport
Airport Layout Plan

Roseburg, Oregon

DECEMBER 2019

AIP GRANT 3-41-0054-023

OREGON STATE MAP

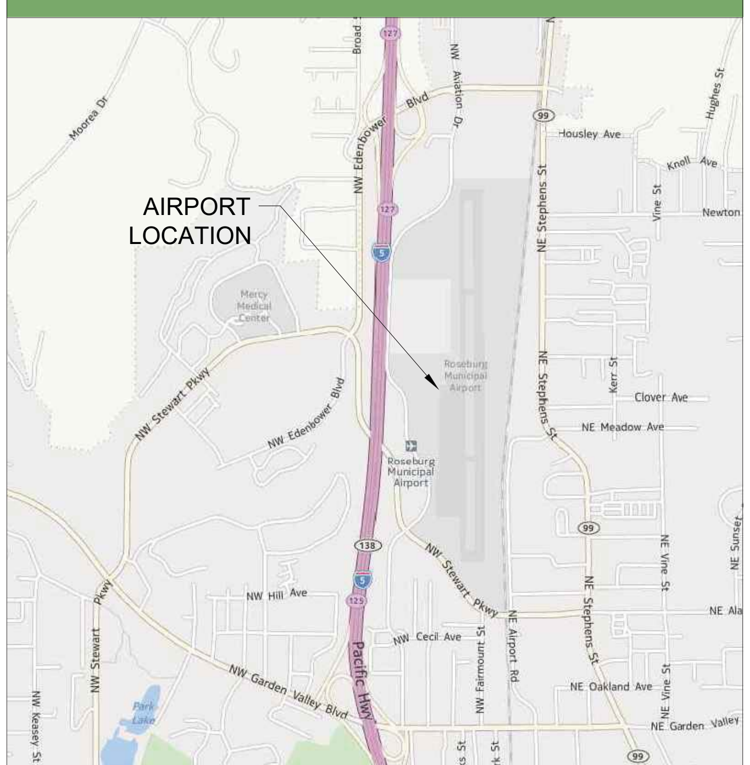


DOUGLAS COUNTY, OREGON

SHEET INDEX

SHEET NUMBER	SHEET TITLE
1	INDEX
2	DATA SHEET
3	AIRPORT LAYOUT PLAN
4	PART 77 AIRSPACE PLAN
5	PART 77 PROFILES
6	INNER APPROACH RUNWAY 16-34
7	DEPARTURE SURFACE
8	RUNWAY CENTERLINE PROFILE
9	BUILDING AREA PLAN SOUTH
10	BUILDING AREA PLAN NORTH
11	LAND USE PLAN
12	AIRPORT PROPERTY MAP

LOCATION MAP

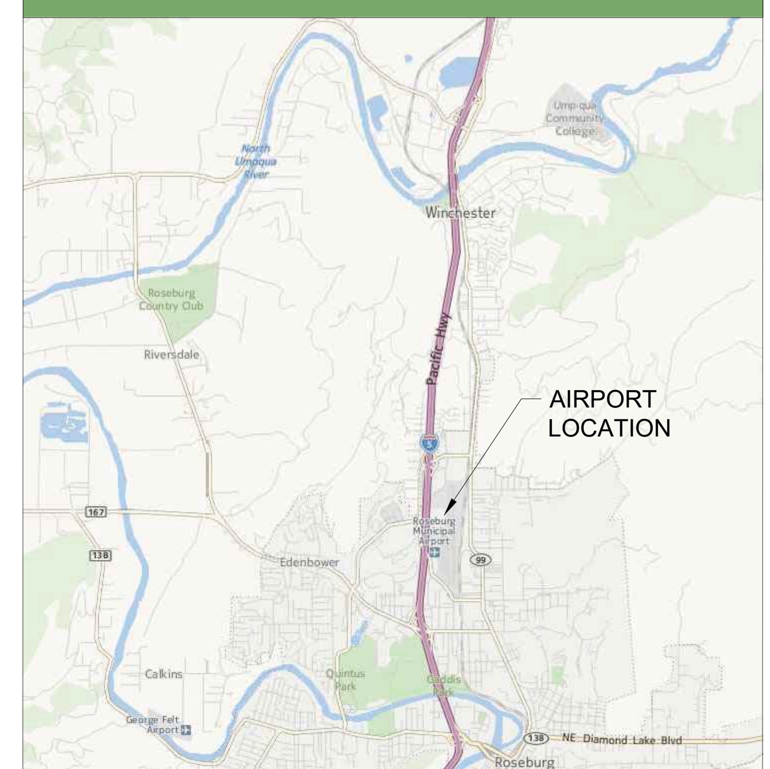


SUBMITTED BY:
CITY OF ROSEBURG

By ______________________

Title ______________________ Date ______________________

VICINITY MAP



Mead & Hunt

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meadhunt.com

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ROSEBURG REGIONAL AIRPORT
AIRPORT LAYOUT PLAN
City of Roseburg
900 SE Douglas Ave
Roseburg, Oregon 97470

REVISIONS

#	DESCRIPTION	BY	DATE
1	Updated Mar. 2006 - Century West Eng.	CWE	03/06
2	Updated Aug. 2015 AIP-022	M&H	08/15
3	2018 Master Plan - ALP Update	M&H	12/19

M&H NO.: 1821200-170097.01
DATE: DECEMBER 2019
DESIGNED BY: SHR
DRAWN BY: SHR
CHECKED BY: KM
DO NOT SCALE DRAWINGS

SHEET CONTENTS

INDEX

SHEET NO.

RUNWAY DATA

			RUNWAY 16-34			
			EXISTING		FUTURE	
UTILITY / GREATER THAN UTILITY			Greater than Utility		No Change	
RUNWAY DESIGN CODE			B-II		No Change	
APPROACH REFERENCE CODE			B/II/8000		No Change	
CRITICAL AIRCRAFT	AIRCRAFT		Cessna Citation XLS		No Change	
	WINGSPAN		56.3'		No Change	
	APPROACH SPEED (kts)		117 knots		No Change	
	MAX. TAKEOFF WT. (lbs.)		20,200 lbs		No Change	
	COCKPIT TO MAIN GEAR		21.9'		No Change	
	MAIN GEAR WIDTH		15.6'		No Change	
	TAXIWAY DESIGN GROUP		2		No Change	
PAVEMENT STRENGTH AND MATERIAL TYPE	SURFACE MATERIAL		Asphalt		No Change	
	DESIGN STRENGTH (1,000#) - S/D/DT		42/ 54 / 88		No Change	
	STRENGTH BY PCN		16/F/D/X/T		No Change	
c	SURFACE TREATMENT		Non-Grooved		No Change	
EFFECTIVE GRADIENT (%)			0.6%		No Change	
VERTICAL LINE OF SIGHT PROVIDED			Yes		No Change	
RUNWAY LENGTH			5,003'		No Change	
RUNWAY WIDTH			100'		75'	
RUNWAY END ELEVATIONS		16	533.5'	16	No Change	
		34	500.8'	34	No Change	
DISPLACED THRESHOLD		16	1,100'	16	No Change	
		34	372'	34	No Change	
DISPLACED THRESHOLD ELEVATIONS		16	523.8'	16	No Change	
		34	503.9'	34	No Change	
RUNWAY TOUCHDOWN ZONE ELEVATIONS		16	523.8'	16	No Change	
		34	520.3'	34	No Change	
RUNWAY HIGH POINT			533.5'		No Change	
RUNWAY LOW POINT			500.8'		No Change	
RUNWAY SAFETY AREA (RSA) LENGTH BEYOND RUNWAY END	REQUIRED	16	300'	16	No Change	
		34	300'	34	No Change	
	ACTUAL	16	300'	16	No Change	
		34	300'	34	No Change	
RUNWAY SAFETY AREA WIDTH	REQUIRED		150'		No Change	
	ACTUAL		150'		No Change	
RUNWAY EDGE LIGHTING			Medium Intensity		No Change	
RUNWAY PROTECTION ZONE (RPZ) APPROACH (Inner Width x Outer Width x Length)		16	500'x700'x1,000'	16	No Change	
		34	500'x700'x1,000'	34	No Change	
RUNWAY PROTECTION ZONE (RPZ) DEPARTURE (Inner Width x Outer Width x Length)		16	500'x700'x1,000'	16	No Change	
		34	500'x700'x1,000'	34	No Change	
RUNWAY MARKING		16	Non-Precision	16	No Change	
		34	Non-Precision	34	No Change	
PART 77 APPROACH CATEGORY		16	Non-Precision [C(NP)]	16	No Change	
		34	Non-Precision [C(NP)]	34	No Change	
PART 77 APPROACH SLOPE		16	34:1	16	No Change	
		34	34:1	34	No Change	
APPROACH VISIBILITY MINIMUMS		16	1 1/2 - Mile	16	No Change	
		34	1 1/2 - Mile	34	No Change	
AERONAUTICAL SURVEY REQUIRED (VERTICALLY GUIDED OR NOT)		16	No	16	No Change	
		34	No	34	No Change	
RUNWAY DEPARTURE SURFACE		16	N/A	16	No Change	
		34	N/A	34	No Change	
RUNWAY OBJECT FREE AREA (ROFA) (Length Beyond Runway End)		16	300'	16	No Change	
		34	300'	34	No Change	
RUNWAY OBJECT FREE AREA WIDTH		16	500'	16	No Change	
	N1	34	390'	34	500'	
OBSTACLE FREE ZONE (OFZ) (Length Beyond Runway End)		16	200'	16	No Change	
		34	200'	34	No Change	
OBSTACLE FREE ZONE WIDTH			400'		No Change	
INNER-APPROACH OFZ LENGTH		16	N/A	16	No Change	
(For Rwys w/ Approach Lighting System. Begins 200' from Rwy end @ 50:1		34	N/A	34	No Change	
INNER-APPROACH OFZ WIDTH			N/A		No Change	
INNER-TRANSITIONAL OFZ WIDTH		16	N/A	16	No Change	
(For Runways w/ <3/4-mile Approach Visibility Minimums)		34	N/A	34	No Change	
PRECISION OBSTACLE FREE ZONE (Length x Width)		16	N/A	16	No Change	
(For Rwys w/vert. guided approach and <250' ceiling/<3/4 mile visibility)		34	N/A	34	No Change	
THRESHOLD SITING SURFACE (Per AC 150/5300-13A, Table 3-2 - Change 1. See Airspace Plan for more information.)		16	20:1- Approach end expected to serve large airplanes (visual day/night); or instrument minimums ≥ 1 statue mile (day only)	16	No Change	
		34	20:1- Approach end with instrument night operations serving approach category A and B aircraft only	34	No Change	
NAVIGATION AIDS		16	N/A	16	No Change	
		34	RNAV (GPS)-B, VOR-A	34	No Change	
VISUAL AIDS		16	REIL	16	Supplemental Wind Cone	
		34	PAPI-4R, REIL, Primary Wind Cone	34	No Change	
RUNWAY C.L. TO:	PARALLEL RUNWAY C.L.		N/A		N/A	
	HOLDING POSITION		200'		No Change	
	PARALLEL TAXIWAY C.L.		240'		No Change	
	AIRCRAFT PARKING AREA		250'		No Change	
	HELICOPTER TOUCHDOWN PAD		N/A		No Change	

DECLARED DISTANCES

	RUNWAY 16		RUNWAY 34	
	EXISTING	FUTURE	EXISTING	FUTURE
TAKEOFF RUN AVAILABLE (TORA)	5,003'	No Change	5,003'	No Change
TAKEOFF DISTANCE AVAILABLE (TODA)	5,003'	No Change	5,003'	No Change
ACCELERATE-STOP DISTANCE AVAILABLE (ASDA)	5,003'	No Change	5,003'	No Change
LANDING DISTANCE AVAILABLE (LDA)	3,902'	No Change	4,631'	No Change

RUNWAY END COORDINATES

		EXISTING	FUTURE
16	LAT.	43° 14' 46.308" N	No Change
	LONG.	123° 21' 21.107" W	No Change
34	LAT.	43° 13' 56.905" N	No Change
	LONG.	123° 21' 21.031" W	No Change
16 DT	LAT.	43° 14' 35.442" N	No Change
	LONG.	123° 21' 21.090" W	No Change
34 DT	LAT.	43° 14' 00.568" N	No Change
	LONG.	123° 21' 21.037" W	No Change

AIRPORT DATA

		EXISTING	FUTURE
AIRPORT IDENTIFIER		RBG	No Change
AIRPORT REFERENCE CODE		B-II	No Change
MEAN MAX. TEMP. (Hottest Month) b		85.5° F (July)	No Change
AIRPORT ELEVATION (Above Mean Sea Level)		533.5'	No Change
AIRPORT NAVIGATIONAL AIDS a		PAPI, REILs	No Change
AIRPORT REFERENCE POINT	LATITUDE	43° 14' 21.6102" N	No Change
	LONGITUDE	123° 21' 21.0569 W	No Change
MISCELLANEOUS FACILITIES a d		100LL, Jet A, Tie-downs, Primary Wind Cone, ASOS	Supplemental Wind Cone
CRITICAL AIRCRAFT		Cessna Citation XLS	No Change
MAGNETIC DECLINATION e		14° 49' East (±0° 21') MAY 2019	Moving 0° 5' West / Year
NPIAS SERVICE LEVEL		Regional	No Change
STATE SERVICE LEVEL		Category III: Regional GA	No Change
AIRPORT ACREAGE f	Fee Simple	187 acres	No Change
	Avigation Easement	11.5 acres	No Change

ALP NOTES

- ALP prepared using design criteria from FAA Advisory Circulars 150/5300-13A Change 1, "Airport Design", 150/5070-6A, FAA Standard Operating Procedures 2.00 and 3.00, and Part 77 of the Federal Aviation Regulations (FAR), "Safe, Efficient Use, and Preservation of the Navigable Airspace."
- All coordinates NAD83 and all elevations NAVD88. Horizontal and vertical datum source: AGIS Survey, Geoterra, October 2017, performed for this ALP update.

a All Navigational Aids and Miscellaneous Facilities are owned by the Airport.

b Temperature data source: Western Regional Climate Center, Station ID: Eugene, Oregon (726930).

c Existing pavement design strength source: 5010 Master Record and Airport AVN Data Sheet and comments from Airport.

d The ASOS has a Critical Area of 500 feet.

e Magnetic Declination source: National Geophysical Data Center.

f Airport Property Boundary Source: Approved 2015 ALP. Property lines and acreages retained from previous ALP.

TAXIWAY DATA

	A (N3)		A1 (T1)		A2		A3 (N2)		A4 (N2)		A5 (N2)		A6	
	EXISTING	FUTURE	EXISTING	FUTURE	EXISTING	FUTURE	EXISTING	FUTURE	EXISTING	FUTURE	EXISTING	FUTURE	EXISTING	FUTURE
TAXIWAY DESIGN GROUP	2	No Change	N/A	2	2	No Change	2	No Change	2	No Change	2	No Change	2	No Change
AIRCRAFT DESIGN GROUP	II	No Change	N/A	II	II	No Change	II	No Change	II	No Change	II	No Change	II	No Change
WIDTH	35'	No Change	N/A	35'	100'	35'	36'	35'	36'	35'	36'	35'	100'	35'
TAXIWAY SAFETY AREA WIDTH	79'	No Change	N/A	79'	79'	No Change	79'	No Change	79'	No Change	79'	No Change	79'	No Change
TAXIWAY EDGE SAFETY MARGIN	7.5'	No Change	N/A	7.5'	7.5'	No Change	7.5'	No Change	7.5'	No Change	7.5'	No Change	7.5'	No Change
TAXIWAY OBJECT FREE AREA WIDTH	131'	No Change	N/A	131'	131'	No Change	131'	No Change	131'	No Change	131'	No Change	131'	No Change
DISTANCE from TWY. ℄ to FIXED/MOVABLE OBJECT	65.5'	No Change	N/A	65.5'	65.5'	No Change	65.5'	No Change	65.5'	No Change	65.5'	No Change	65.5'	No Change
TAXIWAY WINGTIP CLEARANCE	26'	No Change	N/A	26'	26'	No Change	26'	No Change	26'	No Change	26'	No Change	26'	No Change
DISTANCE from RUNWAY ℄ to TAXIWAY ℄	240'	No Change	N/A	240'	240'	No Change	240'	No Change	240'	No Change	240'	No Change	240'	No Change
TAXIWAY LIGHTING	Medium	No Change	N/A	Medium	Medium	No Change	Medium	No Change	Medium	No Change	Medium	No Change	Medium	No Change
DISTANCE FROM RUNWAY ℄ to HOLD BARS	N/A	No Change	N/A	N/A	N/A	No Change	N/A	No Change	N/A	No Change	N/A	No Change	N/A	No Change

NOTES:

T1 Future Taxiway Connector

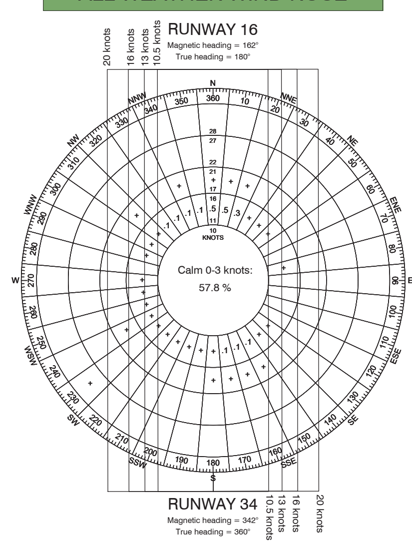
NON-STANDARD CONDITIONS

EXISTING CONDITION	DISPOSITION
N1 The ROFA at the South End of Runway 34 does not meet standards. NW Stewart Parkway lies within the ROFA.	Reroute NW Stewart Parkway outside ROFA when the road reaches the end of its useful life and will need to be constructed. A modification to standards will be submitted.
N2 Taxiways connect directly from Runway 16/34 to apron.	Existing taxiways will be relocated to break direct connection.
N3 No full length parallel Taxiway for Runway 16/34	Extend Taxiway A and construct Taxiway A1

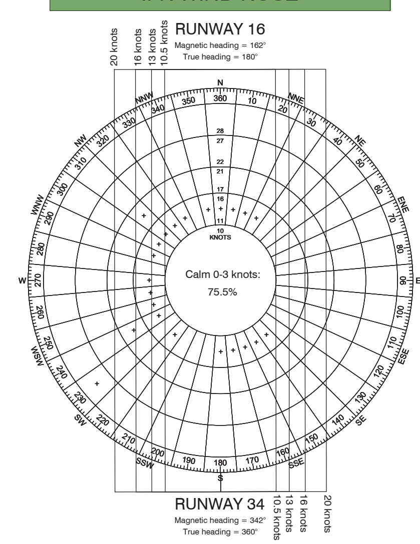
MODIFICATION TO STANDARDS

APPROVAL DATE	AIRSPACE CASE NO.	STANDARD TO BE MODIFIED	DESCRIPTION
PENDING APPROVAL	PENDING SUBMITTAL	ROFA	PENDING SUBMITTAL

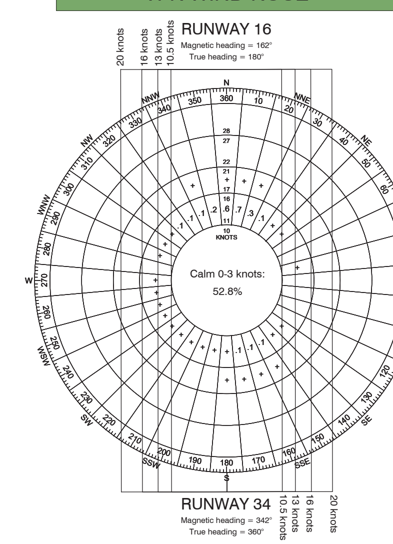
ALL WEATHER WIND ROSE



IFR WIND ROSE



VFR WIND ROSE



ALL WEATHER WIND COVERAGE

RUNWAY	10.5 KNOTS (12 M.P.H.)	13 KNOTS (15 M.P.H.)	16 KNOTS (18.5 M.P.H.)	20 KNOTS (23 M.P.H.)
16-34	99.87%	99.96%	100.00%	100.00%
Number of Observations:	111,273			

IFR WIND COVERAGE

RUNWAY	10.5 KNOTS (12 M.P.H.)	13 KNOTS (15 M.P.H.)	16 KNOTS (18.5 M.P.H.)	20 KNOTS (23 M.P.H.)
16-34	99.94%	99.97%	99.99%	100.00%
Number of Observations:	24,591			

VFR WIND COVERAGE

RUNWAY	10.5 KNOTS (12 M.P.H.)	13 KNOTS (15 M.P.H.)	16 KNOTS (18.5 M.P.H.)	20 KNOTS (23 M.P.H.)
16-34	99.85%	99.96%	100.00%	100.00%
Number of Observations:	87,088			

Wind Data Source: FAA AGIS Wind Data Observations (Station # 726930)
Period of Time: 2006 - 2017
Note: Windrose compass headings are true north.
Crosswind component computed using Runway True Bearings (179.921 - 359.921).

Mead & Hunt

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THE CITY OF ROSEBURG

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AIRPORT LAYOUT PLAN

City of Roseburg
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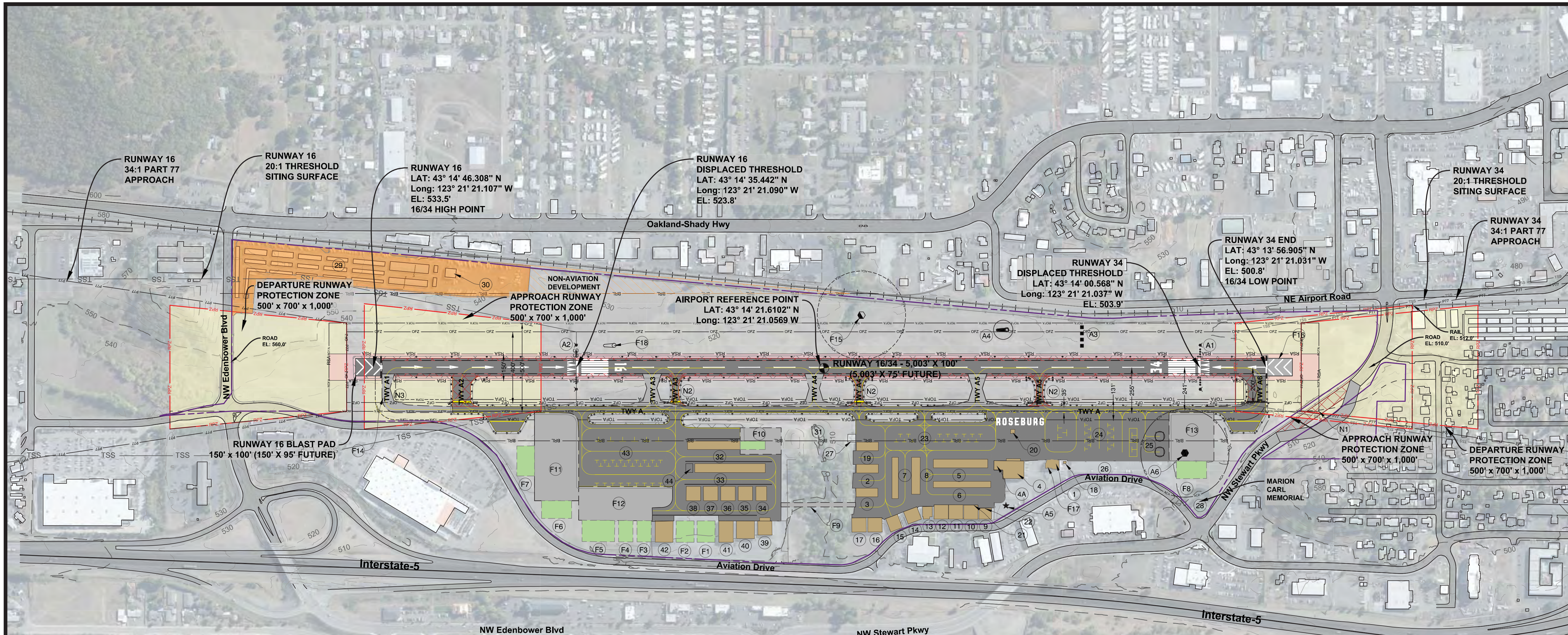
SHEET CONTENTS

DATA SHEET

SHEET NO.



DRAWING LEGEND

	EXISTING	FUTURE
AIRFIELD PAVEMENT		
PAVEMENT TO BE REMOVED	N/A	
PAVEMENT SHOULDER		N/A
AIRPORT PROPERTY		N/A
AIRPORT REFERENCE POINT		N/A
RUNWAY SAFETY AREA (RSA)	RSA	N/A
RUNWAY PROTECTION ZONE (RPZ)	RPZ	N/A
RUNWAY OBJECT FREE AREA (ROFA)	ROFA	N/A
OBSTACLE FREE ZONE (OFZ)	OFZ	N/A
FAR PART 77 APPROACH SURFACE	P77	N/A
THRESHOLD SITING SURFACE (TSS)	TSS	N/A
BUILDING - ON AIRPORT		
BUILDING - OFF AIRPORT		N/A
BUILDING RESTRICTION LINE (BRL)	BRL	N/A
TAXIWAY / LANE MARKING		
TAXIWAY OBJECT FREE AREA (TOFA)	TOFA	N/A
RUNWAY LIGHTS (EDGE/THRESHOLD/TAXIWAY)	● / ●●● / •	N/A
RUNWAY END IDENTIFIER LIGHT (b)		N/A
AIRPORT BEACON	★	N/A
PRECISION APPROACH PATH INDICATOR (PAPI)	■ ■ ■ ■	N/A
RUNWAY / TAXIWAY SIGN		N/A
WIND CONE		
MONUMENT		N/A
AUTO. SURFACE OBSERVING SYSTEM (ASOS)		
ASOS CRITICAL AREA (ACA)	ACA	ACA ACA
RAILROAD		N/A
ROAD		
GRAVEL ROAD		N/A
FENCE (6 Feet)		N/A
TERRAIN CONTOURS	500	N/A
NON-AERONAUTICAL DEVELOPMENT		

EXISTING FACILITIES

FACILITY	ELEVATION	FACILITY	ELEVATION
1 Aviation Suites	537'	23 Aircraft Tiedown Apron	513'
2 G T-Hangars (Single)	526'	24 Aircraft Tiedown Apron	507'
3 H T-Hangars (Single)	525'	25 Helicopter Parking	503'
4 FBO (2251)	541'	26 Auto Parking	506'
4A Lear Hangar (2251A)	541'	27 Aircraft Wash Rack	513'
5 B T-Hangars (Single)	526'	28 Marion Carl Memorial	500'
6 C T-Hangars (Single)	527'	29 Mini Storage Facility (Leased)	580'
7 D T-Hangars (Twin)	528'	30 Shop (Leased)	567'
8 E T-Hangars (Single)	532'	31 Fish Passage	498'
9 Corporate Hangar (2311)	543'	32 J T-Hangars (Twin)	534'
10 Corporate Hangar (2321)	534'	33 I T-Hangars(Single)	530'
11 Corporate Hangar (2331)	532'	34 Corporate Hangar (2777)	530'
12 Corporate Hangar (2341)	535'	35 Corporate Hangar (2785)	530'
13 Corporate Hangar (2351)	532'	36 Corporate Hangar (2795)	533'
14 Corporate Hangar (2361)	533'	37 Corporate Hangar (2805)	534'
15 Corporate Hangar (2371)	535'	38 Corporate Hangar (2815)	536'
16 Corporate Hangar (2381)	536'	39 Corporate Hangar (2775)	530'
17 Corporate Hangar (2391)	535'	40 Corporate Hangar (2787)	534'
18 Electrical Vault	519'	41 Corporate Hangar (2797)	533'
19 F T-Hangars	527'	42 Corporate Hangar (2825)	543'
20 Fuel Farm	528'	43 Aircraft Tiedown Apron	517'
21 Fuel Tanks (Private)	--	44 Aircraft Wash Rack	513'
22 Fuel Tanks (Private)	--		

FUTURE FACILITIES (c)

F1 Corporate Hangar
F2 Corporate Hangar
F3 Corporate Hangar
F4 Corporate Hangar
F5 Corporate Hangar
F6 Corporate Hangar
F7 Corporate Hangar
F8 Corporate Hangar
F9 Vehicle Access Road
F10 J T-Hangars Extension
F11 Aviation Reserve 1
F12 Aviation Reserve 2
F13 Aviation Reserve 3
F14 Taxiway A Extension
F15 ASOS Location
F16 Runway 34 Blast Pad (150' X 95')
F17 Acquire Aviation Suites
F18 Supplemental Wind Cone

VISUAL AND NAVAIDS

A1 Runway 16 End Identifier Lights (REILs)
A2 Runway 34 End Identifier Lights (REILs)
A3 Runway 34 Precision Approach Path Indicator (PAPI)
A4 Primary Wind Cone and Segmented Circle
A5 Non-directional Rotating Light Beacon
A6 Automated Surface Observing System (ASOS)

SPONSOR APPROVAL SPACE

FAA APPROVAL SPACE

NON-STANDARD CONDITIONS

EXISTING CONDITION	DISPOSITION
N1 The ROFA at the South End of Runway 34 does not meet standards. A portion of NW Stewart Parkway lies within the ROFA.	Reroute road outside ROFA when NW Stewart Parkway needs improvement.
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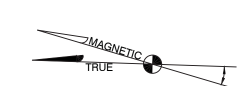
- All coordinates NAD83 and all elevations NAVD88. Horizontal and vertical datum source: AGIS Survey, Geoterra, October 2017, performed for this ALP update.
- Per Part 77, 15 feet vertical clearance added to road elevations and 23 feet added to railroads.

(a) Magnetic Declination source: National Geophysical Data Center, May 2019.

(b) Hangar layout footprints are conceptual based on facility requirements. Exact layout and dimensions may vary based on hangar developer.

(c) Specific facility development not conceptually shown will need to undergo a planning analysis to determine eligibility, layout and justification for the purposes of FAA AIP funding support. If the development is proposed within a 1-5 year time frame, such a planning study may not be able to be supported through AIP funding by the FAA.



(a) MAGNETIC DECLINATION:
14° 49' East (±0° 21')
ANNUAL CHANGE: 0° 5' WEST
MAY 2019

300'
0 FEET 600'

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AIRPORT LAYOUT PLAN

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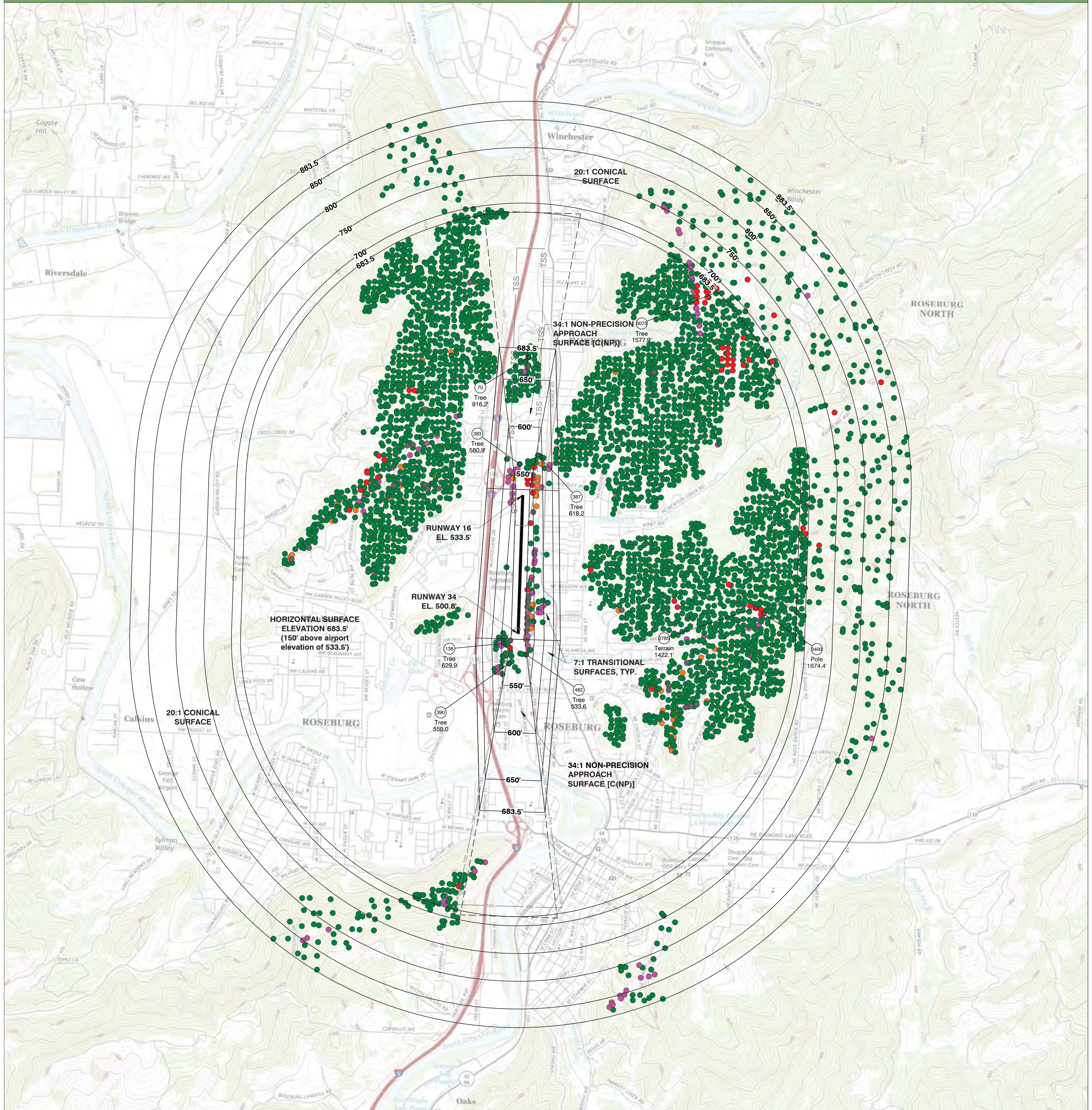
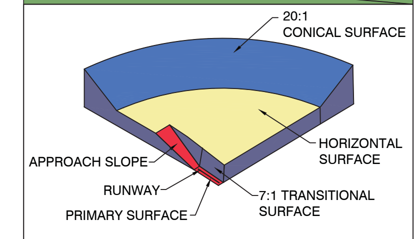
PART 77 PLAN



TYPICAL FAR PART 77 SURFACES



PART 77 PROFILES NOTES

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- All coordinates NAD83 and all elevations NAVD88. Horizontal and vertical datum source: AGIS Survey, Geoterra, October 2017, performed for this ALP update.
- Basemap source: USGS Topographic maps.
- For outer approach plans to Runway 16 and 34, see Sheet 5.
- For close-in obstruction detail near each runway end, see Inner-Approach Plans, Sheet 6.

(a) Magnetic Declination source: National Geophysical Data Center, May 2019.

DRAWING LEGEND

	EXISTING
PART 77 SURFACE	
THRESHOLD SITING SURFACE	TSS
RUNWAY	
TERRAIN CONTOURS	800
TREES / VEGETATION	
TERRAIN	
BUILDING / VERTICAL STRUCTURE	
TOWER / POLE	
ROAD / RAILROAD	

COMPREHENSIVE PART 77 AGIS PENETRATIONS

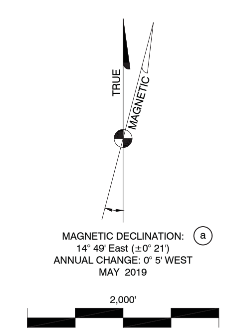
	APPROACHES 16	APPROACHES 34	PRIMARY	TRANSITION	HORIZONTAL	CONICAL
# TREES / VEGETATION THAT PENETRATE PART 77 SURFACE	66	9	0	57	3,297	512
# TERRAIN THAT PENETRATE PART 77 SURFACE	3	1	0	5	42	11
# BUILDINGS THAT PENETRATE PART 77 SURFACE	0	0	0	13	39	0
# TOWERS / POLES THAT PENETRATE PART 77 SURFACE	7	0	0	31	50	22
# ROADS / RAILRAODS THAT PENETRATE PART 77 SURFACE	2	0	0	13	19	0

Note: All penetrations from the 2017 AGIS survey are represented on this table. For detail on close-in obstructions in RPZ areas and lateral transitional surface, see Inner-Approach Plans.

PART 77 AGIS OBJECTS

Point#	OBJECT DESCRIPTION	OBJECT ELEVATION (feet)	PART 77 SURFACE	PART 77 SURFACE ELEVATION (feet)	PART 77 SURFACE PENETRATION (feet)	TSS SURFACE ELEVATION (feet)	TSS PENETRATION (feet)	DISPOSTION
3400	Pole	1674.4	Horizontal	683.5	990.9	Object Not Under Surface	--	Light
3075	Tree	1577.3	Horizontal	683.5	893.8	Object Not Under Surface	--	Remove
2765	Terrain	1442.1	Horizontal	683.5	758.6	Object Not Under Surface	--	Remove
387	Tree	618.2	Transitional	567.7	50.5	Object Not Under Surface	--	Remove
138	Tree	629.9	Transitional	579.5	50.4	Object Not Under Surface	--	Remove
482	Tree	533.6	RWY 34 Approach	516.7	16.8	549.5	-16.0	Remove
390	Tree	555.0	RWY 34 Approach	576.9	78.1	566.8	-11.8	Remove
70	Tree	816.2	RWY 16 Approach	673.7	142.5	827.1	-10.9	Remove
383	Tree	580.9	RWY 16 Approach	560.4	20.6	634.5	-53.5	Remove

Note: A negative penetration value indicates the object is clear of the airspace surface



Mead & Hunt
Mead & Hunt, Inc.
9600 NE Cascades Parkway
Suite 100
Portland, OR 97220
phone: 503-548-1494
meadhunt.com

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ROSEBURG REGIONAL AIRPORT
AIRPORT LAYOUT PLAN

City of Roseburg
900 SE Douglas Ave
Roseburg, Oregon 97470

REVISIONS

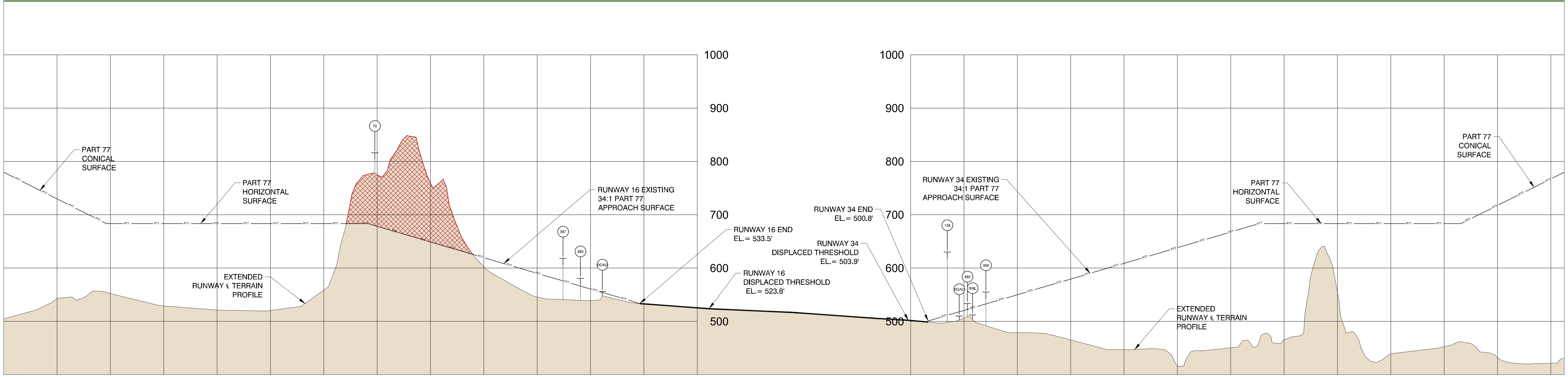
#	DESCRIPTION	BY	DATE
1	Updated Mar. 2006 - Century West Eng.	CWE	03/06
2	Updated Aug. 2015 AIP-022	M&H	08/15
3	2018 Master Plan - ALP Update	M&H	12/19

M&H NO.: 1821200-170097.01
DATE: DECEMBER 2019
DESIGNED BY: SHR
DRAWN BY: SHR
CHECKED BY: KM
DO NOT SCALE DRAWINGS

SHEET CONTENTS
PART 77 AIRSPACE PLAN

SHEET NO.

RUNWAY 16/34 OUTER APPROACH PROFILE



PART 77 AGIS OBJECTS

Point#	OBJECT DESCRIPTION	OBJECT ELEVATION (feet)	PART 77 SURFACE	PART 77 SURFACE ELEVATION (feet)	PART 77 SURFACE PENETRATION (feet)	TSS SURFACE ELEVATION (feet)	TSS PENETRATION (feet)	DISPOSTION
387	Tree	618.2	Transitional	567.7	50.5	Object Not Under Surface	--	Remove
138	Tree	629.9	Transitional	579.5	50.4	Object Not Under Surface	--	Remove
482	Tree	533.6	RWY 34 Approach	516.7	16.8	549.5	-16.0	Remove
390	Tree	555.0	RWY 34 Approach	526.9	28.1	566.8	-11.8	Remove
70	Tree	816.2	RWY 16 Approach	673.7	142.5	827.1	-10.9	Remove
383	Tree	580.9	RWY 16 Approach	560.4	20.6	634.5	-53.5	Remove

Note: A negative penetration value indicates the object is clear of the airspace surface.

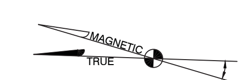
DRAWING LEGEND

	EXISTING
PART 77 SURFACE	—— P77 ——
TERRAIN PENETRATION	

PART 77 PROFILES NOTES

- ALP prepared using design criteria from FAA Advisory Circular 150/5300-13A Change 1, *Airport Design*, FAA Standard Operating Procedures 2.00 and 3.00, and Part 77 of the Federal Aviation Regulations (FAR), *Safe, Efficient Use, and Preservation of the Navigable Airspace*.
- All coordinates NAD83 and all elevations NAVD88. Horizontal and vertical datum source: AGIS Survey, Geoterra, October 2017, performed for this ALP update.

(a) Magnetic Declination source: National Geophysical Data Center, May 2019.



MAGNETIC DECLINATION: (a)
14° 49' East (±0° 21')
ANNUAL CHANGE: 0° 5' WEST
MAY 2019

PROFILE VIEW:
VERTICAL EXAGGERATION OF 100
VERTICAL SCALE: 1"=100

0 1,000' 2,000'
FEET

Mead & Hunt

Mead & Hunt, Inc.
9600 NE Cascades Parkway
Suite 100
Portland, OR 97220
phone: 503-548-1494
meadhunt.com

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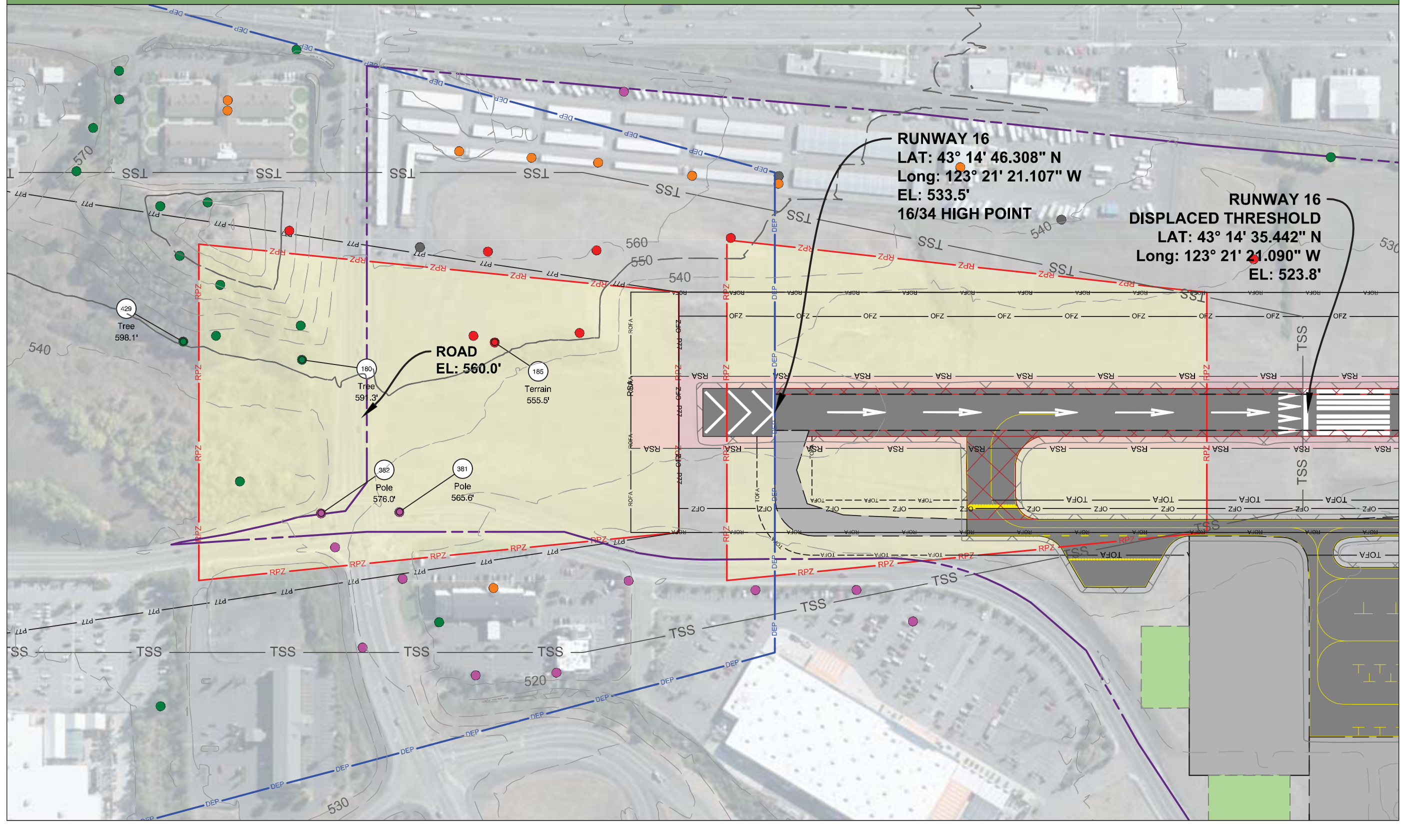
DESIGNED BY: SHR
DRAWN BY: SHR
CHECKED BY: KM
DO NOT SCALE DRAWINGS

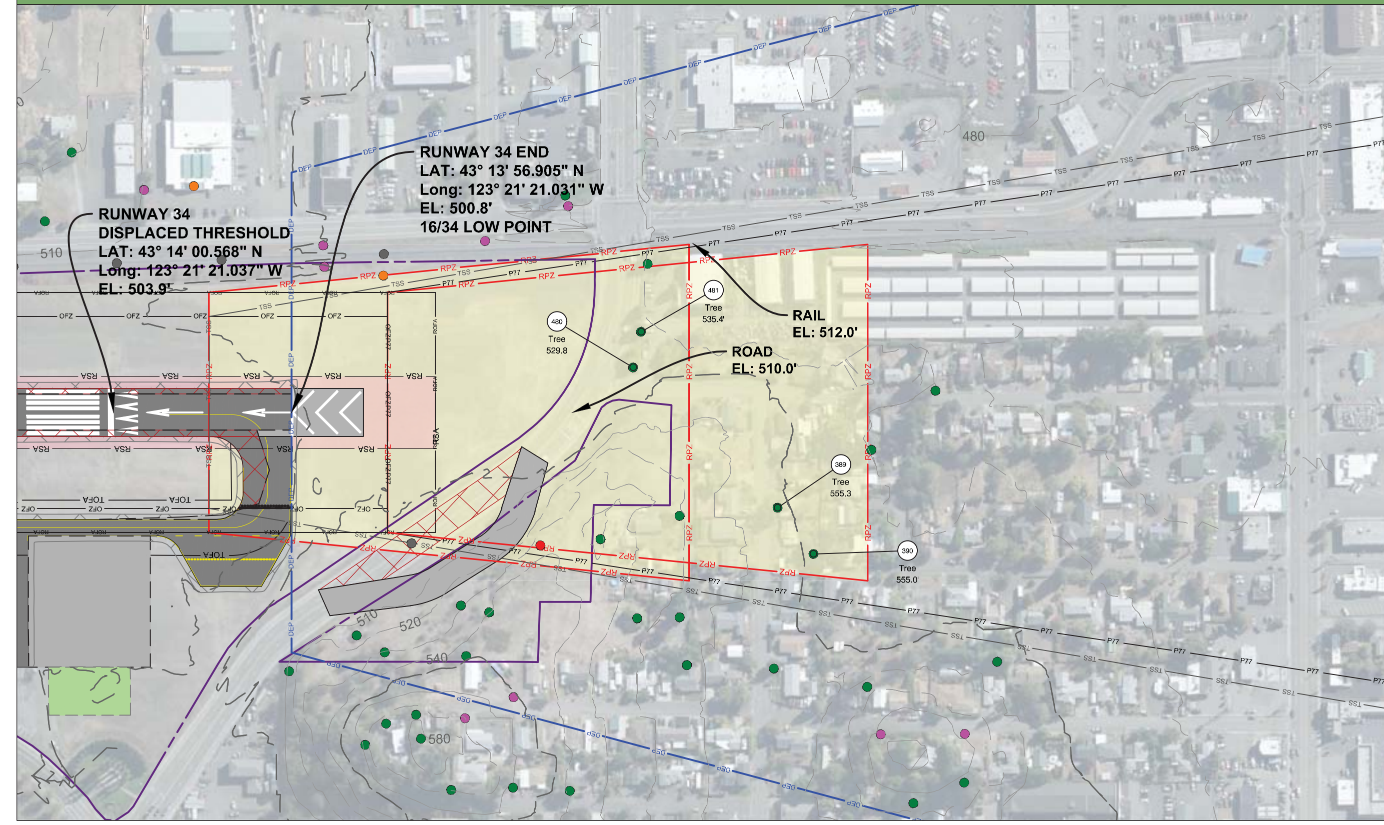
SHEET CONTENTS
PART 77 PROFILES

SHEET NO.

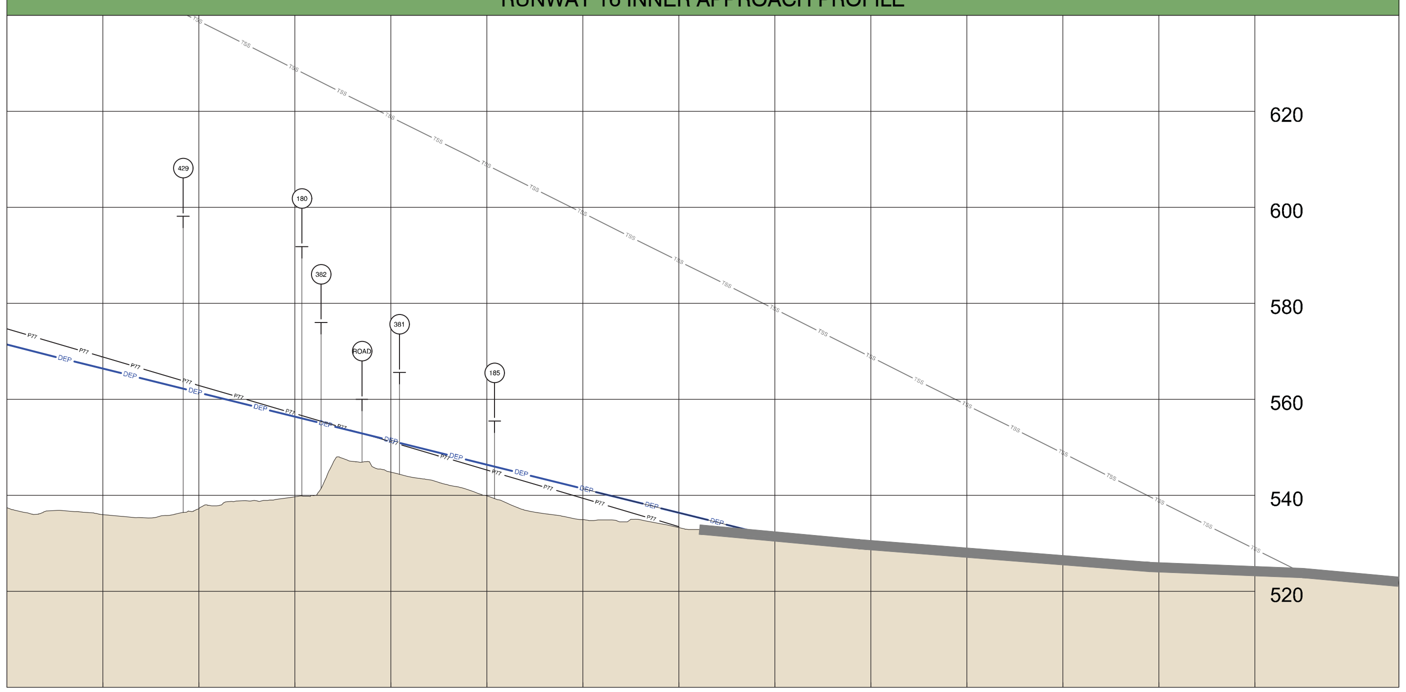
RUNWAY 16 INNER APPROACH PLAN



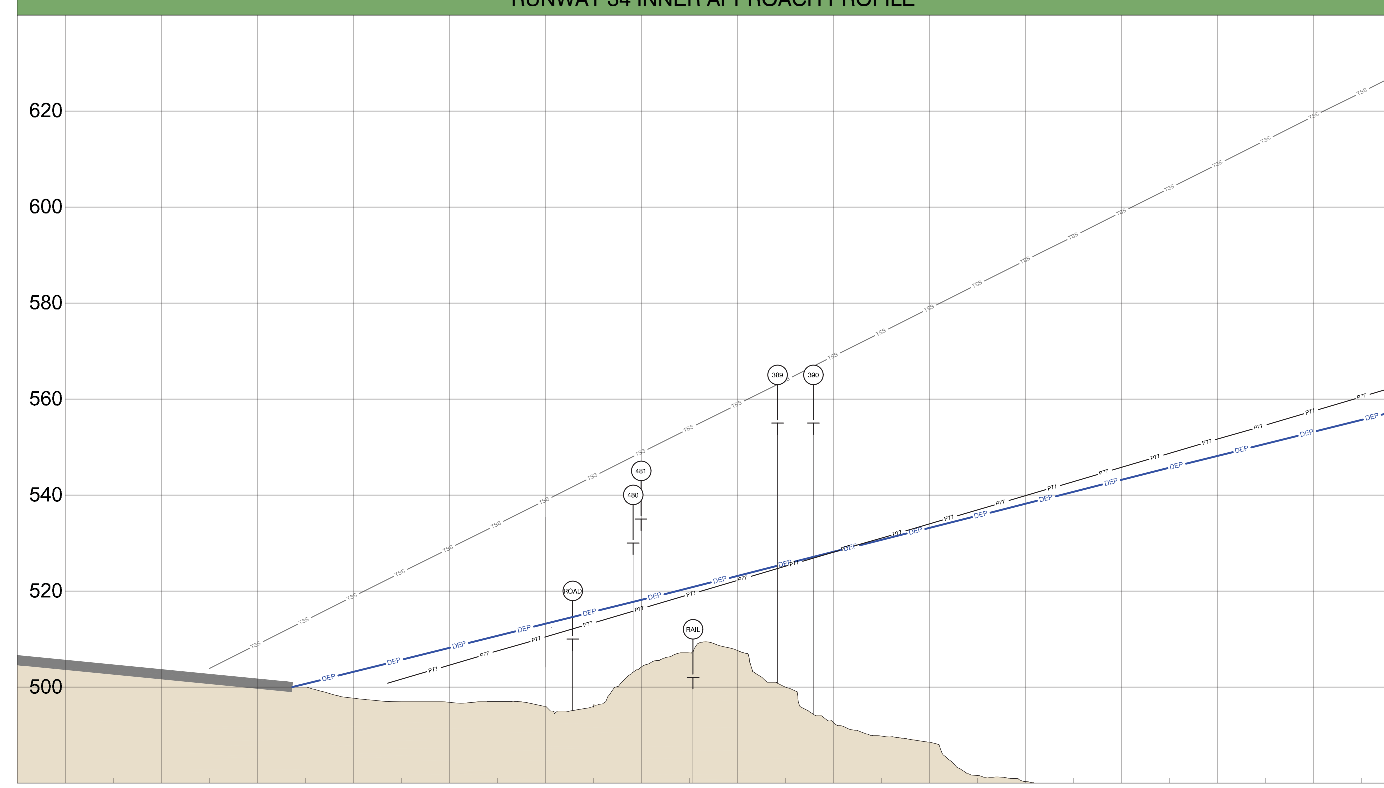
RUNWAY 34 INNER APPROACH PLAN



RUNWAY 16 INNER APPROACH PROFILE



RUNWAY 34 INNER APPROACH PROFILE



DRAWING LEGEND

AIRPORT PROPERTY	
PART 77 SURFACE	P77
THRESHOLD SITING SURFACE	TSS
DEPARTURE SURFACE	DEP
AIRFIELD PAVEMENT	
FUTURE AIRFIELD PAVEMENT	
FUTURE BUILDING - ON AIRPORT	
OBJECT	
TREES / VEGETATION	
TERRAIN	
BUILDING / VERTICAL STRUCTURE	
TOWER / POLE	
ROAD / RAILROAD	
TERRAIN CONTOURS	500

INNER APPROACH NOTES

- ALP prepared using design criteria from FAA Advisory Circular 150/5300-13A Change 1, *Airport Design*, FAA Standard Operating Procedures 2.00 and 3.00, and Part 77 of the Federal Aviation Regulations (FAR), *Safe, Efficient Use, and Preservation of the Navigable Airspace*.
- All coordinates NAD83 and all elevations NAVD88. Horizontal and vertical datum source: AGIS Survey, Geoterra, October 2017, performed for this ALP update.
- Per Part 77, 15 feet vertical clearnace added to road elevations and 23 feed added to railroads.

(a) Magnetic Declination source: National Geophysical Data Center, May 2019.

RUNWAY 16 AGIS OBJECTS

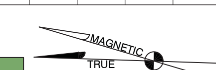
Point#	OBJECT DESCRIPTION	OBJECT ELEVATION (feet)	PART 77 SURFACE	PART 77 SURFACE ELEVATION (feet)	PART 77 SURFACE PENETRATION (feet)	TSS SURFACE ELEVATION (feet)	TSS PENETRATION (feet)	DISPOSTION
185	Terrain	555.5	RWY 16 Approach	544.8	10.7	608.0	-52.5	Light
180	Tree	591.3	RWY 16 Approach	556.6	34.7	628.0	-36.8	Remove
429	Tree	598.1	RWY 16 Approach	563.9	34.3	640.4	-42.3	Remove
382	Pole	576.0	RWY 16 Approach	555.5	20.5	626.0	-50.0	Light
381	Pole	565.6	RWY 16 Approach	510.2	55.4	617.9	-52.3	Light

Note: A negative penetration value indicates the object is clear of the airspace surface.

RUNWAY 34 AGIS OBJECTS

Point#	OBJECT DESCRIPTION	OBJECT ELEVATION (feet)	PART 77 SURFACE	PART 77 SURFACE ELEVATION (feet)	PART 77 SURFACE PENETRATION (feet)	TSS SURFACE ELEVATION (feet)	TSS PENETRATION (feet)	DISPOSTION
480	Tree	529.8	RWY 34 Approach	515.8	14.0	548.0	-18.2	Remove
481	Tree	535.4	RWY 34 Approach	516.3	19.1	548.8	-13.4	Remove
389	Tree	555.3	RWY 34 Approach	524.7	30.6	563.1	-7.8	Remove
390	Tree	555.0	RWY 34 Approach	526.9	28.1	566.8	-11.8	Remove

Note: A negative penetration value indicates the object is clear of the airspace surface.



MAGNETIC DECLINATION:
14° 49' East (±0° 21') (a)
ANNUAL CHANGE: 0° 5' WEST
MAY 2019

200'
0 FEET 400'

PROFILE VIEW:
VERTICAL EXAGGERATION OF 10
VERTICAL SCALE: 1"=20'

Mead & Hunt, Inc.
9600 NE Cascades Parkway
Suite 100
Portland, OR 97220
phone: 503-548-1494
meadhunt.com

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M&H NO.:	1821200-170097.01
DATE:	DECEMBER 2019
DESIGNED BY:	SHR
DRAWN BY:	SHR
CHECKED BY:	KM

DO NOT SCALE DRAWINGS

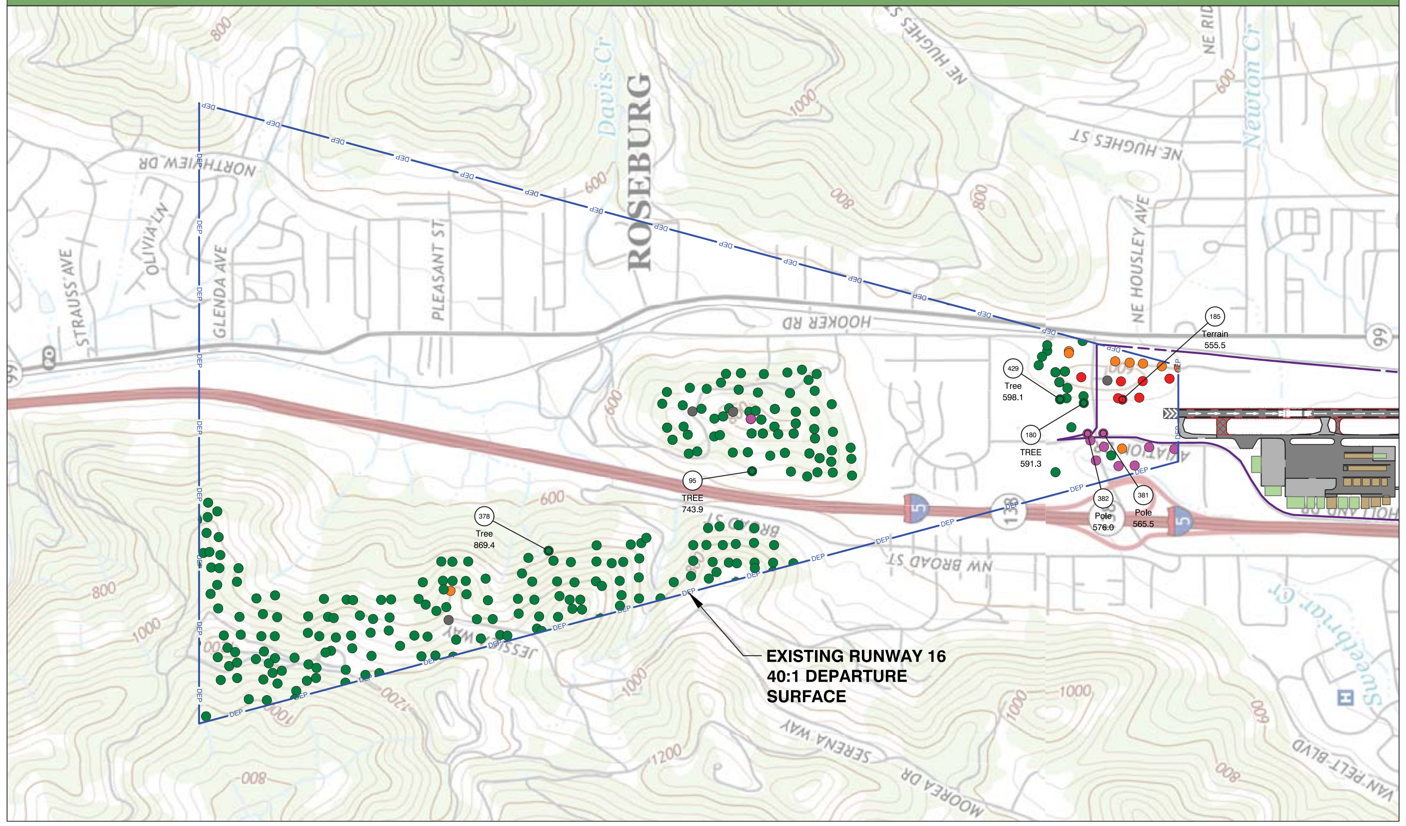
SHEET CONTENTS

INNER APPROACH RUNWAY 16-34

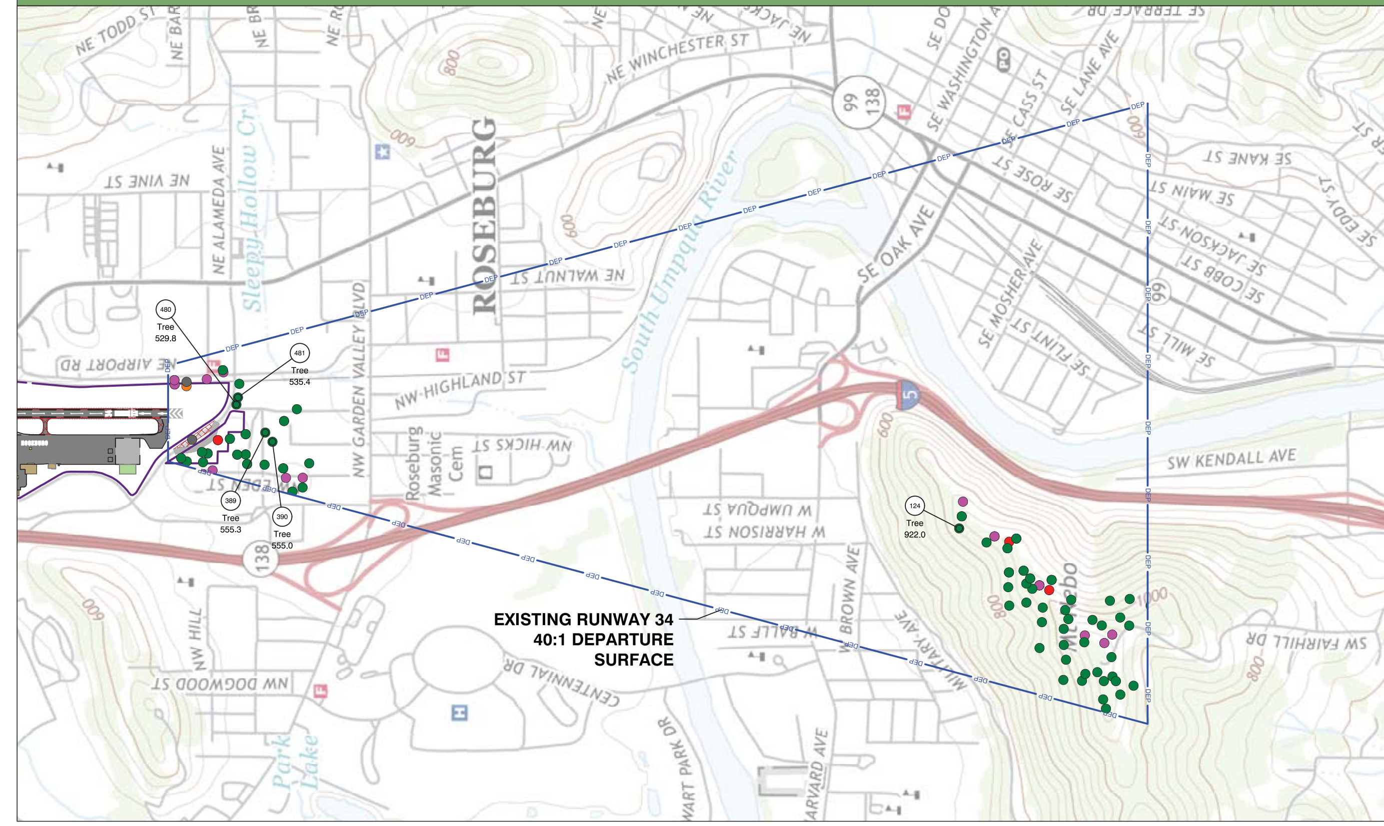
SHEET NO.

12/12/2019 11:24:45 AM

RUNWAY 16 DEPARTURE SURFACE



RUNWAY 34 DEPARTURE SURFACE



RUNWAY 16 AGIS OBJECTS

Point#	OBJECT DESCRIPTION	OBJECT ELEVATION (feet)	DEPARTURE SURFACE ELEVATION (feet)	DEPARTURE SURFACE PENETRATION (feet)	DISPOSTION
185	Terrain	555.5	544.8	10.7	Light
180	Tree	591.3	558.1	33.1	Remove
429	Tree	598.1	564.3	33.8	Remove
382	Pole	576.0	557.1	18.9	Light
381	Pole	565.6	553.0	12.5	Light
95	Tree	743.9	644.5	99.4	Remove
378	Tree	869.4	697.5	171.9	Remove

Note: A negative penetration value indicates the object is clear of the airspace surface.

RUNWAY 34 AGIS OBJECTS

Point#	OBJECT DESCRIPTION	OBJECT ELEVATION (feet)	DEPARTURE SURFACE ELEVATION (feet)	DEPARTURE SURFACE PENETRATION (feet)	DISPOSTION
480	Tree	529.8	518.6	11.2	Remove
481	Tree	535.4	519.0	16.4	Remove
389	Tree	555.3	526.1	29.2	Remove
390	Tree	555.0	528.0	27.0	Remove
124	Tree	922.0	706.7	215.3	Remove

Note: A negative penetration value indicates the object is clear of the airspace surface.

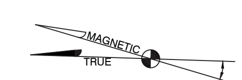
DRAWING LEGEND

	EXISTING
AIRPORT PROPERTY	
DEPARTURE SURFACE	DEP
TERRAIN CONTOURS	800
AIRFIELD PAVEMENT	
FUTURE AIRFIELD PAVEMENT	
FUTURE BUILDING - ON AIRPORT	
TREES / VEGETATION	
TERRAIN	
BUILDING / VERTICAL STRUCTURE	
TOWER / POLE	
ROAD / RAILROAD	

DEPARTURE NOTES

- ALP prepared using design criteria from FAA Advisory Circular 150/5300-13A Change 1, *Airport Design*, FAA Standard Operating Procedures 2.00 and 3.00, and Part 77 of the Federal Aviation Regulations (FAR), *Safe, Efficient Use, and Preservation of the Navigable Airspace*.
- All coordinates NAD83 and all elevations NAVD88. Horizontal and vertical datum source: AGIS Survey, Geoterra, October 2017, performed for this ALP update.
- Published Departure Procedures for Runway 16 and Runway 34 have a minimum climb rate of 500 feet per Nautical mile to 4500. This climb rate is significantly greater than the 40:1 Departure surface.

a Magnetic Declination source: National Geophysical Data Center, May 2019.



MAGNETIC DECLINATION:
14° 49' East (±0° 21') a
ANNUAL CHANGE: 0° 5' WEST
MAY 2019

1,000'
0 FEET 2,000'

Mead &Hunt

Mead & Hunt, Inc.
9600 NE Cascades Parkway
Suite 100
Portland, OR 97220
phone: 503-548-1494
meadhunt.com

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M&H NO.: 1821200-170097.01
DATE: DECEMBER 2019
DESIGNED BY: SHR
DRAWN BY: SHR
CHECKED BY: KM
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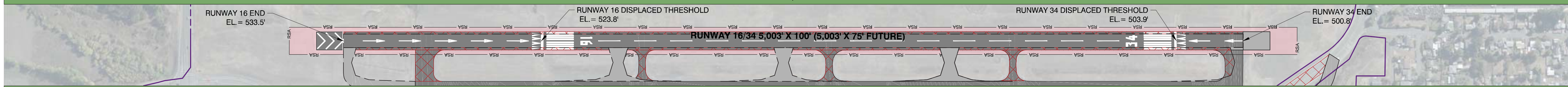
SHEET CONTENTS

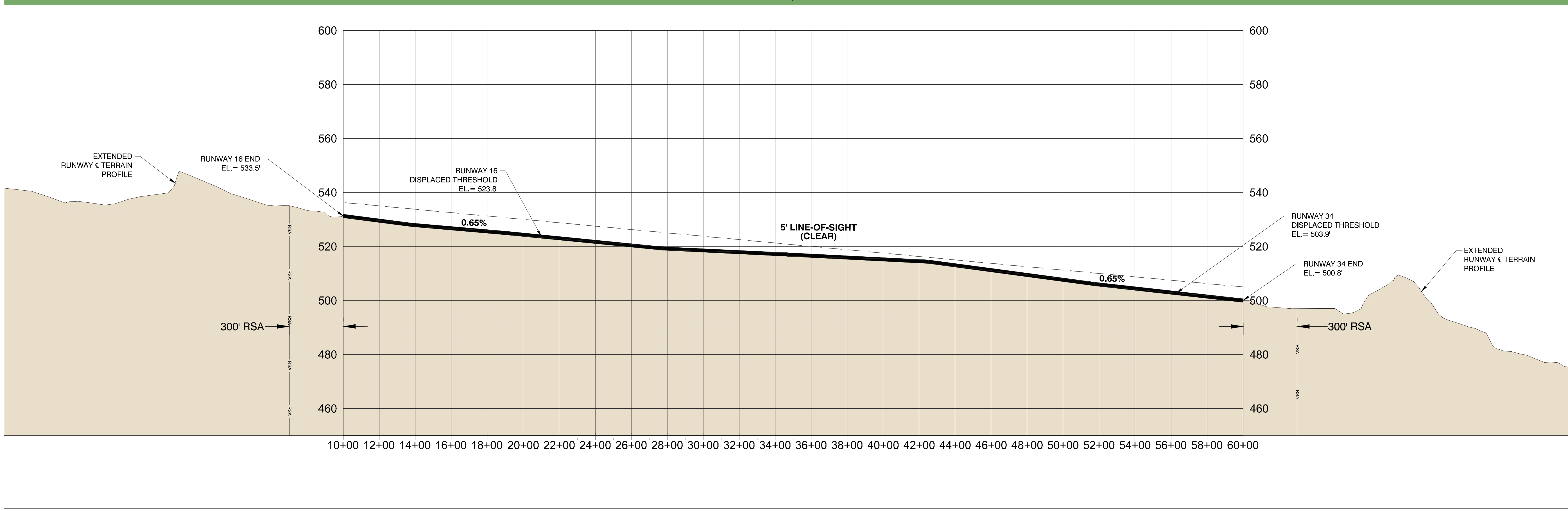
DEPARTURE SURFACE

SHEET NO.

RUNWAY 16/34 PROFILE



RUNWAY 16/34 PROFILE



DRAWING LEGEND

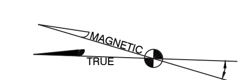
	EXISTING	FUTURE
ACTIVE AIRFIELD PAVEMENT		
PAVEMENT TO BE REMOVED	N/A	
AIRPORT PROPERTY		N/A
AVIGATION EASEMENT		N/A
EXISTING 5' LINE-OF-SIGHT (a)		N/A
RUNWAY SAFETY AREA (RSA)		N/A

RUNWAY PROFILES NOTES

- ALP prepared using design criteria from FAA Advisory Circular 150/5300-13A Change 1, *Airport Design*, FAA Standard Operating Procedures 2.00 and 3.00, and Part 77 of the Federal Aviation Regulations (FAR), *Safe, Efficient Use, and Preservation of the Navigable Airspace*.
- All coordinates NAD83 and all elevations NAVD88. Horizontal and vertical datum source: AGIS Survey, Geoterra, October 2017, performed for this ALP update.

(a) Line of sight standards along individual runways: Runways with a Full Parallel Taxiway. Any point 5 feet above the runway centerline must be mutually visible with any other point 5 feet above the runway centerline that is located at a distance that is less than one half the length of the runway.

(b) Magnetic Declination source: National Geophysical Data Center, May 2019.



MAGNETIC DECLINATION:
14° 49' East (±0° 21')
ANNUAL CHANGE: 0° 5' WEST (b)
MAY 2019

PROFILE VIEW:
VERTICAL EXAGGERATION OF 15
VERTICAL SCALE: 1"=20'

0 300' 600'
FEET

Mead & Hunt

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M&H NO.: 1821200-170097.01
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DESIGNED BY: SHR
DRAWN BY: SHR
CHECKED BY: KM
DO NOT SCALE DRAWINGS

SHEET CONTENTS
RUNWAY CENTERLINE PROFILE

SHEET NO.
8 of 12

X:\1821200\170097.01\TECH\CADALP\RBG ALP SHEET 8 RUNWAY PROFILES.DWG
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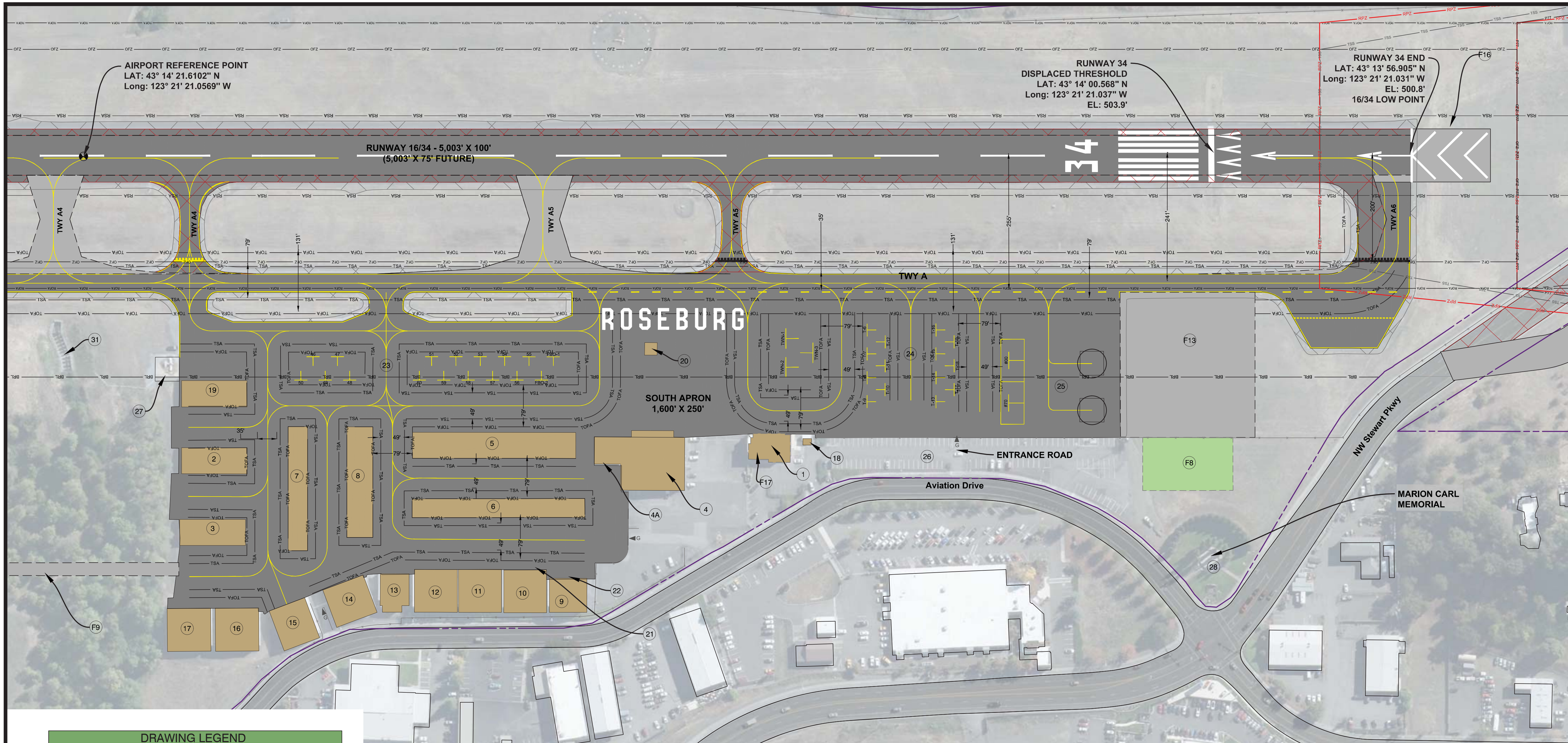

DRAWING LEGEND

	EXISTING	FUTURE
ACTIVE AIRFIELD PAVEMENT		
PAVEMENT TO BE REMOVED	N/A	
PAVEMENT SHOULDER		N/A
AIRPORT PROPERTY		N/A
AIRPORT REFERENCE POINT		N/A
RUNWAY OBJECT FREE AREA (ROFA)		N/A
OBSTACLE FREE ZONE (OFZ)		N/A
FAR PART 77 APPROACH SURFACE		N/A
THRESHOLD SITING SURFACE (TSS)		N/A
BUILDING - ON AIRPORT		
BUILDING - OFF AIRPORT		N/A
BUILDING RESTRICTION LINE (BRL)		N/A
TAXIWAY / LANE MARKING		
TAXIWAY / LANE SAFETY AREA (TSA)		N/A
TAXIWAY / LANE OBJECT FREE AREA (TOFA)		N/A
ROAD		
GRAVEL ROAD		N/A
FENCE (6 Feet)		N/A
GATE		N/A

EXISTING FACILITIES

FACILITY	ELEVATION	FACILITY	ELEVATION
1 Aviation Suites	537'	15 Corporate Hangar (2371)	535'
2 G T-Hangars (Single)	526'	16 Corporate Hangar (2381)	536'
3 H T-Hangars (Single)	525'	17 Corporate Hangar (2391)	535'
4 FBO (2251)	541'	18 Electrical Vault	519'
4A Lear Hangar (2251A)	541'	19 F T-Hangars	527'
5 B T-Hangars (Single)	526'	20 Fuel Farm	528'
6 C T-Hangars (Single)	527'	21 Fuel Tanks (Private)	--
7 D T-Hangars (Twin)	528'	22 Fuel Tanks (Private)	--
8 E T-Hangars (Single)	532'	23 Aircraft Tiedown Apron	513'
9 Corporate Hangar (2311)	543'	24 Aircraft Tiedown Apron	507'
10 Corporate Hangar (2321)	534'	25 Helicopter Parking	503'
11 Corporate Hangar (2331)	532'	26 Auto Parking	506'
12 Corporate Hangar (2341)	535'	27 Aircraft Wash Rack	513'
13 Corporate Hangar (2351)	532'	28 Marion Carl Memorial	500'
		31 Fish Passage	498'

FUTURE FACILITIES (c)

F8	Corporate Hangar
F13	Aviation Reserve 3
F16	Runway 34 Blast Pad
F17	Acquire Aviation Suites

ALP NOTES

- ALP prepared using design criteria from FAA Advisory Circulars 150/5300-13A Change 1, "Airport Design", 150/5070-6A, FAA Standard Operating Procedures 2.00 and 3.00, and Part 77 of the Federal Aviation Regulations (FAR), "Safe, Efficient Use, and Preservation of the Navigable Airspace."
- All coordinates NAD83 and all elevations NAVD88. Horizontal and vertical datum source: AGIS Survey, Geoterra, October 2017, performed for this ALP update.

(a) Magnetic Declination source: National Geophysical Data Center, May 2019.

(b) Hangar layout footprints are conceptual based on facility requirements. Exact layout and dimensions may vary based on hangar developer.

(c) Specific facility development not conceptually shown will need to undergo a planning analysis to determine eligibility, layout and justification for the purposes of FAA AIP funding support. If the development is proposed within a 1-5 year time frame, such a planning study may not be able to be supported through AIP funding by the FAA.

MAGNETIC
TRUE

(a) MAGNETIC DECLINATION:
14° 49' East (±0° 21')
ANNUAL CHANGE: 0° 5' WEST
MAY 2019

0 100' 200'
FEET

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DO NOT SCALE DRAWINGS

SHEET CONTENTS

BUILDING AREA PLAN SOUTH

SHEET NO.

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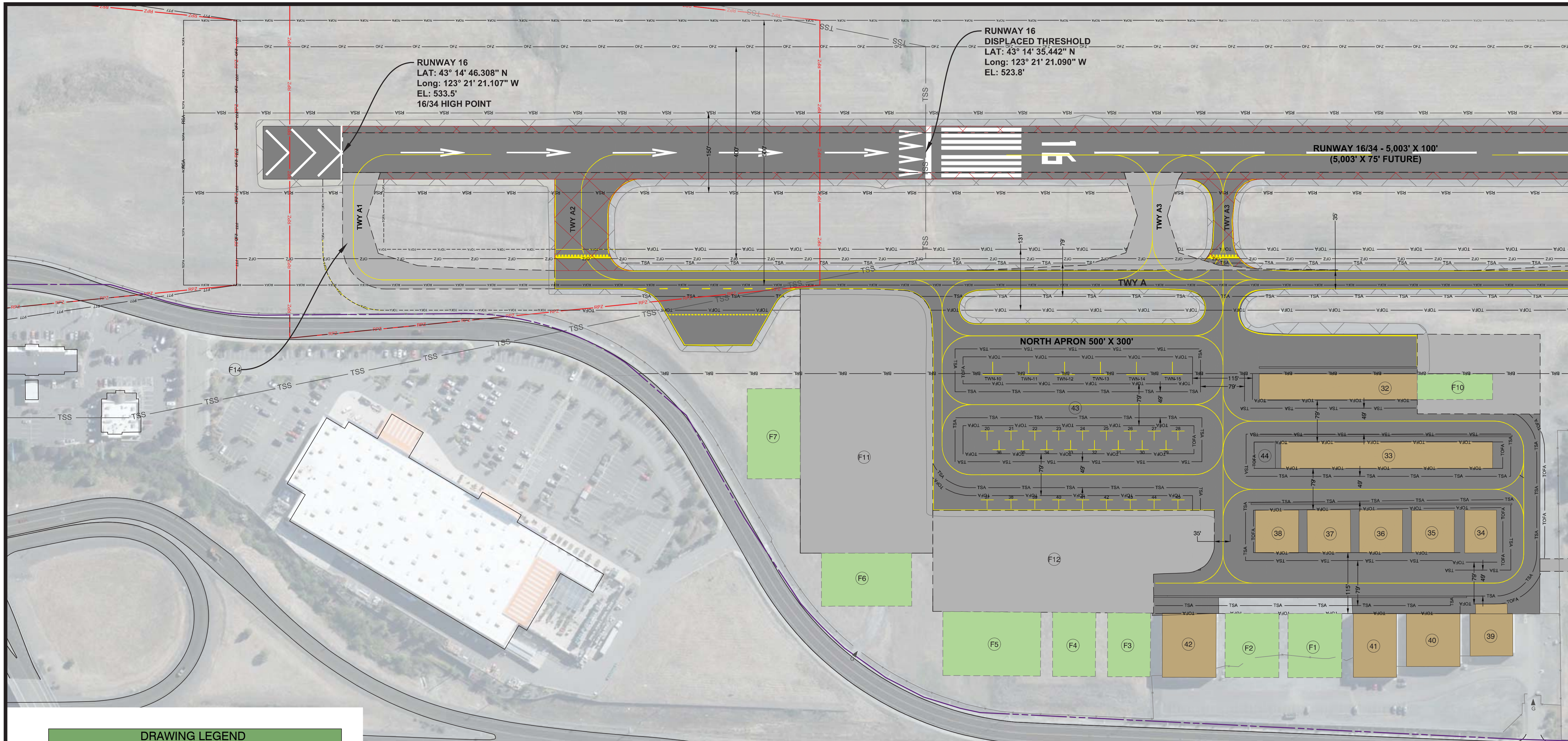

DRAWING LEGEND	EXISTING	FUTURE
ACTIVE AIRFIELD PAVEMENT		
PAVEMENT TO BE REMOVED	N/A	
PAVEMENT SHOULDER		N/A
AIRPORT PROPERTY		N/A
AIRPORT REFERENCE POINT		N/A
RUNWAY OBJECT FREE AREA (ROFA)	ROFA	N/A
OBSTACLE FREE ZONE (OFZ)	OFZ	N/A
FAR PART 77 APPROACH SURFACE	P77	N/A
THRESHOLD SITING SURFACE (TSS)	TSS	N/A
BUILDING - ON AIRPORT		
BUILDING - OFF AIRPORT		N/A
BUILDING RESTRICTION LINE (BRL)	BRL	N/A
TAXIWAY / LANE MARKING		
TAXIWAY / LANE SAFETY AREA (TSA)	TSA	N/A
TAXIWAY / LANE OBJECT FREE AREA (TOFA)	TOFA	N/A
ROAD		N/A
GRAVEL ROAD		N/A
FENCE (6 Feet)		N/A
GATE	G	N/A

EXISTING FACILITIES

FACILITY	ELEVATION	FACILITY	ELEVATION
32 J T-Hangars (Twin)	534'	39 Corporate Hangar (2775)	530'
33 I T-Hangars(Single)	530'	40 Corporate Hangar (2787)	534'
34 Corporate Hangar (2777)	530'	41 Corporate Hangar (2797)	533'
35 Corporate Hangar (2785)	530'	42 Corporate Hangar (2825)	543'
36 Corporate Hangar (2795)	533'	43 Aircraft Tiedown Apron	517'
37 Corporate Hangar (2805)	534'	44 Aircraft Wash Rack	513'
38 Corporate Hangar (2815)	536'		

FUTURE FACILITIES c

F1	Corporate Hangar
F2	Corporate Hangar
F3	Corporate Hangar
F4	Corporate Hangar
F5	Corporate Hangar
F6	Corporate Hangar
F7	Corporate Hangar
F10	J T-Hangars Extension
F11	Aviation Reserve 1
F12	Aviation Reserve 2
F14	Taxiway A Extension
F18	Supplemental Wind Cone

ALP NOTES

- ALP prepared using design criteria from FAA Advisory Circulars 150/5300-13A Change 1, "Airport Design", 150/5070-6A, FAA Standard Operating Procedures 2.00 and 3.00, and Part 77 of the Federal Aviation Regulations (FAR), "Safe, Efficient Use, and Preservation of the Navigable Airspace."
- All coordinates NAD83 and all elevations NAVD88. Horizontal and vertical datum source: AGIS Survey, Geoterra, October 2017, performed for this ALP update.

a Magnetic Declination source: National Geophysical Data Center, May 2019.

b Hangar layout footprints are conceptual based on facility requirements. Exact layout and dimensions may vary based on hangar developer.

c Specific facility development not conceptually shown will need to undergo a planning analysis to determine eligibility, layout and justification for the purposes of FAA AIP funding support. If the development is proposed within a 1-5 year time frame, such a planning study may not be able to be supported through AIP funding by the FAA.

MAGNETIC
TRUE

a MAGNETIC DECLINATION:
14° 49' East (±0° 21')
ANNUAL CHANGE: 0° 5' WEST
MAY 2019

100'
0 FEET 200'

Mead &Hunt
Mead & Hunt, Inc.
9600 NE Cascades Parkway
Suite 100
Portland, OR 97220
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THE CITY OF ROSEBURG

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ROSEBURG REGIONAL AIRPORT
AIRPORT LAYOUT PLAN

City of Roseburg
900 SE Douglas Ave
Roseburg, Oregon 97470

REVISIONS

#	DESCRIPTION	BY	DATE
1	Updated Mar. 2006 - Century West Eng.	CWE	03/06
2	Updated Aug. 2015 AIP-022	M&H	08/15
3	2018 Master Plan - ALP Update	M&H	12/19

M&H NO.: 1821200-170097.01
DATE: DECEMBER 2019
DESIGNED BY: SHR
DRAWN BY: SHR
CHECKED BY: KM
DO NOT SCALE DRAWINGS

SHEET CONTENTS
BUILDING AREA PLAN NORTH

SHEET NO.
10 of 12

DRAWING LEGEND

AIRPORT PROPERTY	
AIRFIELD PAVEMENT	
FUTURE AIRFIELD PAVEMENT	
FUTURE BUILDING - ON AIRPORT	
65 dB DNL: 2016 BASE YEAR OPERATIONS (a)	
65 dB DNL: 2036 OPERATIONS (a)	
CITY OF ROSEBURG LIMITS BOUNDARY	
URBAN GROWTH BOUNDARY	
CITY OF ROSEBURG ZONING (b)	
AP [AIRPORT DISTRICT]	
C-1 [LIMITED COMMERCIAL]	
C-2 [COMMUNITY COMMERCIAL]	
C-3 [GENERAL COMMERCIAL]	
CBD [CENTRAL BUSINESS DISTRICT]	
M-1 [LIGHT INDUSTRIAL]	
M-2 [MEDIUM INDUSTRIAL]	
M-3 [HEAVY INDUSTRIAL]	
MR-14 [LIMITED MULTI-FAMILY RES.]	
MR-18 [MEDIUM-DENSITY MULTI-FAMILY RES.]	
MR-29 [MULTI-FAMILY RES.]	
MR-40 [HIGH-DENSITY MULTI-FAMILY RES.]	
PO [PROFESSIONAL OFFICE]	
MU [MIXED USE]	
PR [PUBLIC RESERVE]	
R-1-6 [SINGLE-FAMILY RES. >6,000 SF]	
R-1-7.5 [SINGLE-FAMILY RES. >7,500 SF]	
R-1-10 [SINGLE-FAMILY RES. >10,000 SF]	
RO [RESIDENTIAL OPEN SPACE]	

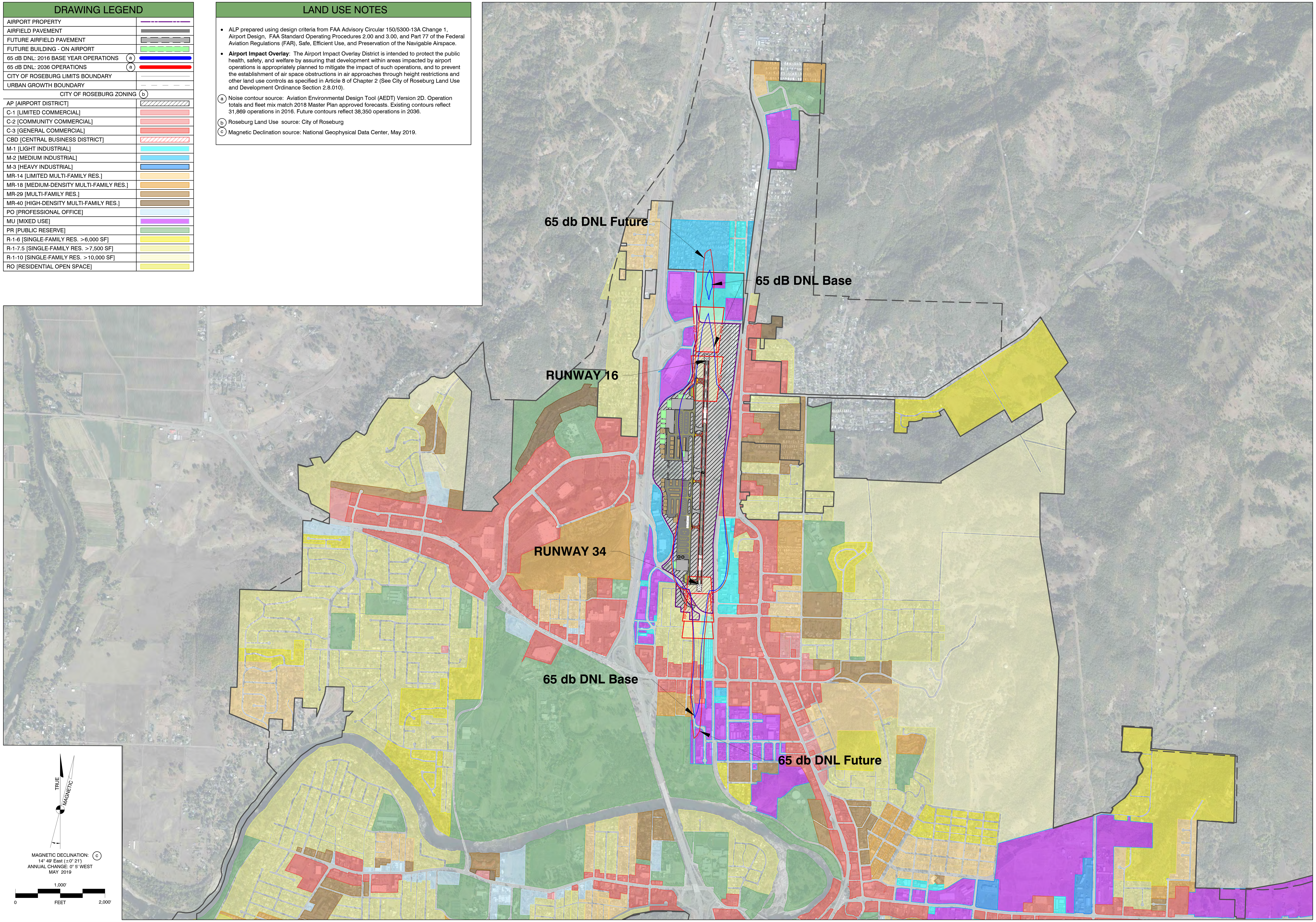
LAND USE NOTES

- ALP prepared using design criteria from FAA Advisory Circular 150/5300-13A Change 1, Airport Design, FAA Standard Operating Procedures 2.00 and 3.00, and Part 77 of the Federal Aviation Regulations (FAR), Safe, Efficient Use, and Preservation of the Navigable Airspace.
- **Airport Impact Overlay**: The Airport Impact Overlay District is intended to protect the public health, safety, and welfare by assuring that development within areas impacted by airport operations is appropriately planned to mitigate the impact of such operations, and to prevent the establishment of air space obstructions in air approaches through height restrictions and other land use controls as specified in Article 8 of Chapter 2 (See City of Roseburg Land Use and Development Ordinance Section 2.8.010).

(a) Noise contour source: Aviation Environmental Design Tool (AEDT) Version 2D. Operation totals and fleet mix match 2018 Master Plan approved forecasts. Existing contours reflect 31,869 operations in 2016. Future contours reflect 38,350 operations in 2036.

(b) Roseburg Land Use source: City of Roseburg

(c) Magnetic Declination source: National Geophysical Data Center, May 2019.



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DESIGNED BY:	SHR
DRAWN BY:	SHR
CHECKED BY:	KM

DO NOT SCALE DRAWINGS

SHEET CONTENTS

LAND USE PLAN

SHEET NO.

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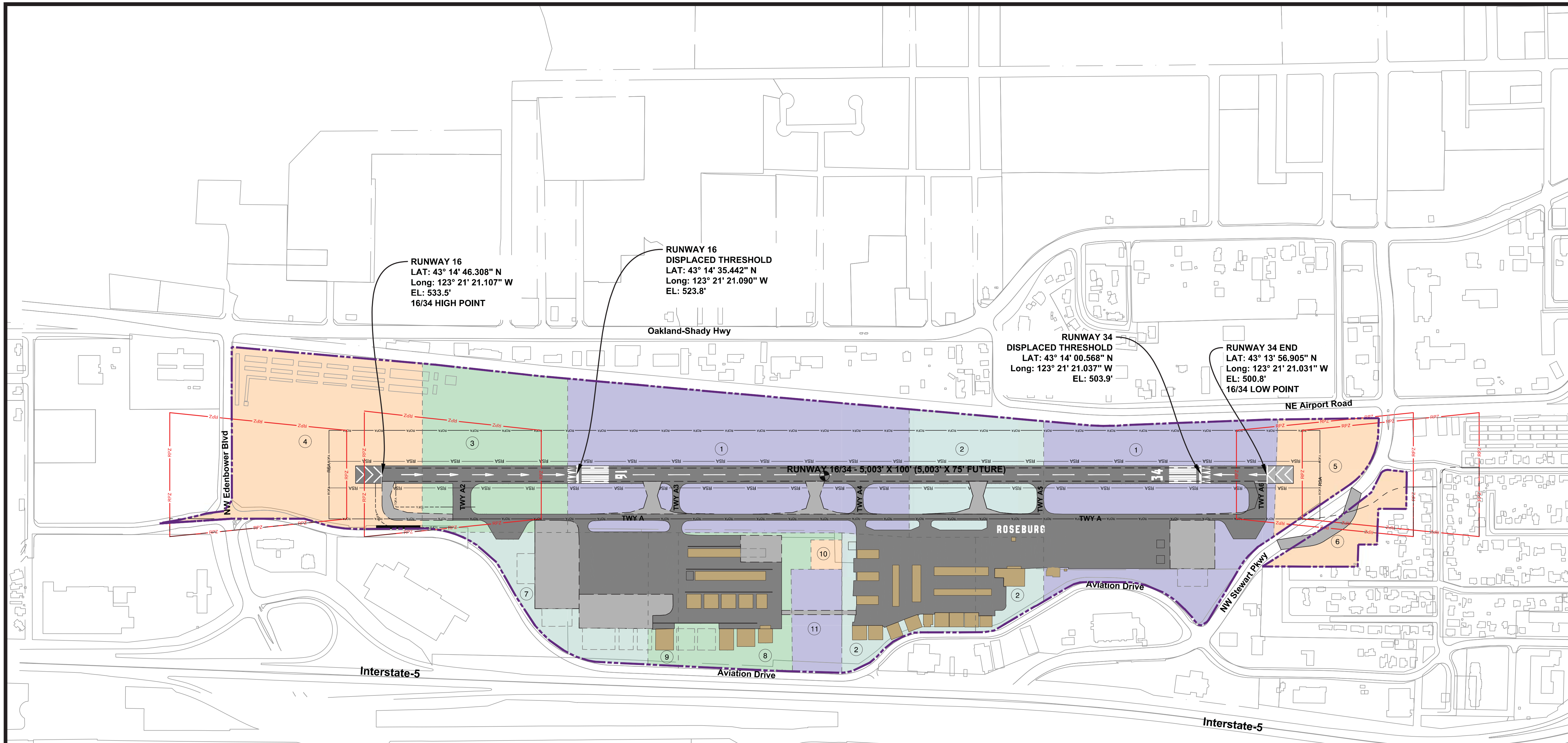


EXISTING AIRPORT PROPERTY DATA

IDENTIFICATION NO. (PLAN)	PARCEL REFERENCE PER AGREEMENT	OWNER (PREVIOUS)	RECORDING INFO	INTEREST	AREA (ACRES)	DATE ACQUIRED	TYPE OF ACQUISITION	FEDERAL AGREEMENT
1	PARCEL 1	EDENBOWER ORCH. L. CO.	V227 P942 (168897)	FEE SIMPLE	62.6±	6-19-29	LOCAL PURCHASE	NONE
2	PARCEL 2	ARTHUR TUCK, ET.UX.	V671 P722 (78-06443)	FEE SIMPLE	26.7±	6-13-29	LOCAL PURCHASE	NONE
3	PARCEL 3	J.M. HOUSLEY, ET.UX.	V191 P515 (120386)	FEE SIMPLE	17.1±	12-30-50	LOCAL PURCHASE	NONE
4	PARCEL 4	N. BOUCOCK, ET.UX.	V564 P477 (75-2300)	FEE SIMPLE	23.8±	12-30-50	LOCAL PURCHASE	NONE
5	PARCEL 5	U.S. PLYWOOD CORP.	V329 P114 (330584)	FEE SIMPLE	6.0±	10-3-63	LOCAL PURCHASE	NONE
6	PARCEL 6	L. ANDERSON, ET.AL.	V569 P935 (75-5914)	FEE SIMPLE	3.7±	5-5-75	AIP-ENTITLEMENT	F.A.A. #8-41-0054-01
		G. KINMAN, ET.UX.	V569 P941 (75-5915)	FEE SIMPLE		4-15-75	AIP-ENTITLEMENT	F.A.A. #8-41-0054-01
		N.F. REED, ET.UX.	V569 P 946 (75-5916)	FEE SIMPLE		4-15-75	AIP-ENTITLEMENT	F.A.A. #8-41-0054-01
7	PARCEL 7	ROSEBURG URBAN RENEWAL	V1432 P175 (96-19694)	FEE SIMPLE	12.4±	9-17-96	AIP-ENTITLEMENT	F.A.A. #3-41-0054-07
8	PARCEL 8	A & R WEST FAMILY L.L.C.	V1893 P179 (2002-20638)	FEE SIMPLE	14.9±	8-1-02	AIP-ENTITLEMENT	F.A.A. #3-41-0054-10
9	PARCEL 9	A & R WEST FAMILY L.L.C.	V1893 P179 (2002-20638)	FEE SIMPLE	2.9±	8-1-02	AIP-ENTITLEMENT	F.A.A. #3-41-0054-11
10	PARCEL 10	A & R WEST FAMILY L.L.C.	V7 P56 (2005-0060)	FEE SIMPLE	0.7±	1-3-05	LOCAL PURCHASE	NONE
11	PARCEL 11	A & R WEST FAMILY L.L.C.	V7 P56 (2011-10623)	FEE SIMPLE	3.8±	7-18-11	AIP-ENTITLEMENT	F.A.A. #3-41-0054-021

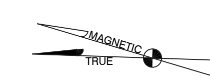
AIRPORT PROPERTY MAP NOTES

- ALP prepared using design criteria from FAA Advisory Circular 150/5300-13A Change 1, *Airport Design*, FAA Standard Operating Procedures 2.00 and 3.00, and Part 77 of the Federal Aviation Regulations (FAR), *Safe, Efficient Use, and Preservation of the Navigable Airspace*.
- All coordinates NAD83 and all elevations NAVD88. Horizontal and vertical datum source: AGIS Survey (Quantum, September 2014) supplemented with survey of removed obstructions (2017). Road and railroad elevations shown with Part 77 penalty added. See Airspace Plan (Sheets 4-11) for more detail and full list of obstructions.

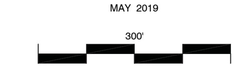
a Magnetic Declination source: National Geophysical Data Center, May 2019.

DRAWING LEGEND

	EXISTING	FUTURE
AIRFIELD PAVEMENT		
PAVEMENT TO BE REMOVED	N/A	N/A
AIRPORT PARCELS (COLOR VARIES)		N/A
AIRPORT PROPERTY		N/A
AIRPORT REFERENCE POINT		N/A
RUNWAY SAFETY AREA (RSA)	RSA	N/A
RUNWAY PROTECTION ZONE (RPZ)	RPZ	N/A
RUNWAY OBJECT FREE AREA (ROFA)	ROFA	N/A
BUILDING - ON AIRPORT		
BUILDING - OFF AIRPORT		N/A
ROAD		



a MAGNETIC DECLINATION:
14° 49' East (±0° 21')
ANNUAL CHANGE: 0° 5' WEST
MAY 2019



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DATE: DECEMBER 2019
DESIGNED BY: SHR
DRAWN BY: SHR
CHECKED BY: KM
DO NOT SCALE DRAWINGS

SHEET CONTENTS
AIRPORT PROPERTY MAP

SHEET NO.

APPENDIX B:

BUILDING INVENTORY

ROSEBURG REGIONAL AIRPORT
APPENDIX B: BUILDING INVENTORY

INTRODUCTION

A building inventory survey was conducted in September 2017 by Mead and Hunt to capture a general assessment of the current condition of the buildings. The hangar sites are divided into two areas. The southern section is the older, original site of the airport, with the northern section being the area of the most currently developed buildings. The areas are separated by a protected wetland area with an active creek.

The buildings on the southern section are older and there is little opportunity to expand without some demolition of the current buildings. This is however, is the more easily accessible area of the airport. This portion contains the FBO, a Lear Hangar, seven T-Hangars and nine corporate hangars. Buildings is this area date back to 1980, with the latest construction being in 1999.

The northern section is the site of the most recent development and has the greatest opportunity for expansion. This site contains two T-Hangars and 12 corporate hangars. One buildings in this area was built in 2000, with all others constructed after 2006.

The wetlands that divide the two sites prevents easy access between the two areas while staying in the secure area. The only path of connection is on an active taxiway. Typically, to go from one section to another force one to leave the secure area and travel on a public roadway to another secure entry.

A summary of the buildings at the Airport is shown in **Table B-1**. **Figure B-1** shows the airport building layout.

The Building Inventory is presented in the following sections.

- Summary
- South Apron Buildings
- North Apron Buildings

B.1 SUMMARY

The south T-Hangars appear to be well maintained but with the age of most of these buildings being between 20-30 years old, there should be consideration for minor renovations and upgrades to these buildings. Improving the lighting and adding or increasing power outlets would provide a more serviceable space for the lessees who use these units. The buildings were surveyed in the middle of a very warm, dry summer. There was some anecdotal evidence that suggest leaking through the roof is an issue. It was difficult to assess the water tightness of the buildings as well as the serviceability of the gutter and downspout system. The roofs should be inspected for water tightness and repaired and sealed where needed. Doors in the older hangars should be inspected as some are difficult to open and close. Exterior painting of the units would provide protection, a greater aesthetic and provide the ability to unify the look of the buildings. Outdoor lighting was not assessed.

There was no access to the corporate hangers, so only a visual inspection from the exterior could be done. The exterior condition is fair to good. These buildings should be evaluated further to assess their condition and the need for minor repairs.

The T-Hangars in the northern half of the airport are in good condition. There appears to be no need to repair these facilities. Continue with good maintenance and visual inspections to promote the longevity of these buildings.

There was no access to the corporate hangers, so only a visual inspection from the exterior could be done. The exterior condition is good. These buildings should need no repairs, but continue with a proactive maintenance program.

Mead &Hunt

Building Number (ALP)	Address	Building
1	2131	Aviation Suites
2	-	G T-Hangars (Single)
3	-	H T-Hangars (Single)
4	2251	FBO
4A	2251A	Lear Hangar
5	-	B T-Hangars (Single)
6	-	C T-Hangars (Single)
7	-	D T-Hangars (Twin)
8	-	E T-Hangars (Single)
9	2311	Corporate Hangar
10	2321	Corporate Hangar
11	2331	Corporate Hangar
12	2341	Corporate Hangar
13	2351	Corporate Hangar
14	2361	Corporate Hangar
15	2371	Corporate Hangar
18	-	F T-Hangars
22	-	Electrical Vault
28	-	Aircraft Fuel
31	-	J T-Hangars (Twin)
32	-	I T-Hangars (Single)
33	2777	Corporate Hangar
34	2785	Corporate Hangar
35	2795	Corporate Hangar
36	2805	Corporate Hangar
37	2815	Corporate Hangar
38	2775	Corporate Hangar
39	2787	Corporate Hangar
40	2797	Corporate Hangar
41	2825	Corporate Hangar

0 100 200

Figure B-1

Building Plan

TABLE B-1: ROSEBURG AIRPORT BUILDING SUMMARY

Hangar Location	Building Number	Year Built	Est. Square Footage	Condition
South Apron	2131 (Aviation Suites)	1985	6,600	Inaccessible
	2251 (FBO)	1984	14,000 (120' x 100')	Fair
	2251A (Lear)	1984	2,500 (50' x 50')	Fair
	B T-Hangars	1999	14,784 (48' x 308')	Fair
	C T-Hangars	1999	11,375 (35' x 325')	Poor
	D T-Hangars	1984	9,984 (48' x 208')	Fair
	E T-Hangars	1985	8,225 (35' x 235')	Fair
	F T-Hangars	1995	5,904 (48' x 123')	Inaccessible
	G T-Hangars	1995	5,904 (48' x 123')	Fair
	H T-Hangars	1995	5,904 (48' x 123')	Fair
	2341	1980	6,400 (80' x 80')	Inaccessible
	2331	1983	6,400 (80' x 80')	Inaccessible
	2321	1987	6,400 (80' x 80')	Inaccessible
	2311	1985	2,275 (35' x 65')	Inaccessible
	2351	1988	3,750 (50' x 75')	Inaccessible
	2361	1994	6,000 (80' x 75')	Inaccessible
	2371	1992	6,684 (78' x 78')	Inaccessible
	2381	1996	6,400 (80' x 80')	Inaccessible
	2391	2000	6,400 (80' x 80')	Inaccessible
North Apron	I T-Hangars	2007	20,000 (50' x 400')	Good
	J T-Hangars	2007	15,000 (50' x 300')	Good
	2775	2007	6,400 (80' x 80')	Inaccessible
	2787	2007	10,000 (100' x 100')	Inaccessible
	2797	Post-2006	10,400 (80' x 130')	Inaccessible
	2825	2006	12,100 (100' x 120')	Inaccessible
	2777	Post-2006	4,800 (60' x 80')	Inaccessible
	2785	2007	6,400 (80' x 80')	Inaccessible
	2795	Post-2006	6,400 (80' x 80')	Inaccessible
	2805	Post-2006	6,400 (80' x 80')	Inaccessible
	2815	Post-2006	6,400 (80' x 80')	Inaccessible

B.2 SOUTH APRON BUILDINGS

Building 2131 (Aviation Suites)

Figure B-2. Aviation Suites

Figure B-3. Aviation Suites

Access to the Aviation Suites building was not available for the survey. The building was constructed in 1985. It is two-stories with an exterior envelope of split faced concrete block with a flat roof. On the airfield side of the building, the second-floor cantilevers over the airfield entry. On the south side of the building, outside entry/exit to the second floor is gained through two, covered exterior stairs. The building, from an exterior inspection, appears to be in good condition.

Building 2251 (FBO Hangar)

Figure B-4. FBO Hangar

Figure B-5. FBO Hangar

Building 2251 is the FBO hangar. It is designed to support aircraft maintenance. Built in 1984, it is a pre-engineered steel building with aluminum siding that is 120’ wide by 100’ deep. The interior walls of the hangar have paneling, approximately 8’ above the floor, to protect the insulation from damage. The hangar door is bi-fold vertical lift door, steel framed with aluminum siding. The interior on the south side of the FBO has an approximately 20’ wide by 100’ deep section of the first-floor dedicated to administrative space. This includes a waiting room, offices, restrooms and other spaces. Above this suite a balcony, open to the maintenance hangar, offers storage space for the hangar. The building is fully insulated and appears to have heating, but the operational condition of the heaters could not be verified. The building has a fire sprinkler system and the lighting by florescent tube fixtures. Building condition is fair.

Building 2251A Lear Hangar

Figure B-6. Lear Hangar

Figure B-7. Lear Hangar

Building 2251A, the Lear Hangar is designed to support aircraft maintenance. Built in 1984. it is a pre-engineered steel building with aluminum siding that is 50' wide by 50' deep, with a ceiling height of approximately 22'. The interior walls of the hangar have paneling, approximately 8' above the floor, to protect the insulation from damage. The hangar doors are multi-hinged folding, horizontal sliding. The door is composed of translucent paneling. The building is fully insulated and appears to have heating, but the operational condition of the heaters could not be verified. The building has a fire sprinkler system and the lighting by florescent tube fixtures. Building condition is fair.

B-Hangars (Single T-Hangars)

Figure B-8. B-Hangar

Figure B-9. B-Hangar

The B-Hangars houses fourteen single engine aircraft hangars and two storage units. Built in 1999, it is a steel framed building with aluminum panels for the walls, exterior siding, roofing and doors. The hangar doors are double horizontal, steel framed sliders. The single engine hangars are approximately 990sf. The building is on a concrete pad. The ceiling is sloped with the high point at 13'-9" and the hangar has fiberglass panels that serve as skylights. The lighting is 2 incandescent light fixtures with one duplex outlet. The building dimensions are 48' wide by 308' long. The building condition is fair.

C-Hangars (Single T-Hangars)

Figure B-10. C-Hangar

Figure B-11. C-Hangar

The Building-C T-Hangars houses ten single engine aircraft hangars. Its construction date is unknown. The building is a steel framed building with aluminum panels for the walls, exterior siding, roofing and doors. The hangar doors are double horizontal, steel framed sliders. The single engine hangars are approximately 1,115sf. The building is on the asphalt tarmac where concrete footings were poured through the tarmac for the foundation. The ceiling is sloped with the high point at 14'-2. The lighting is 1 incandescent light fixture with no power outlets. The building dimensions are 35' wide by 325' long. The building condition is poor.

D-Hangars (Twin T-Hangars)

Figure B-12. D-Hangar

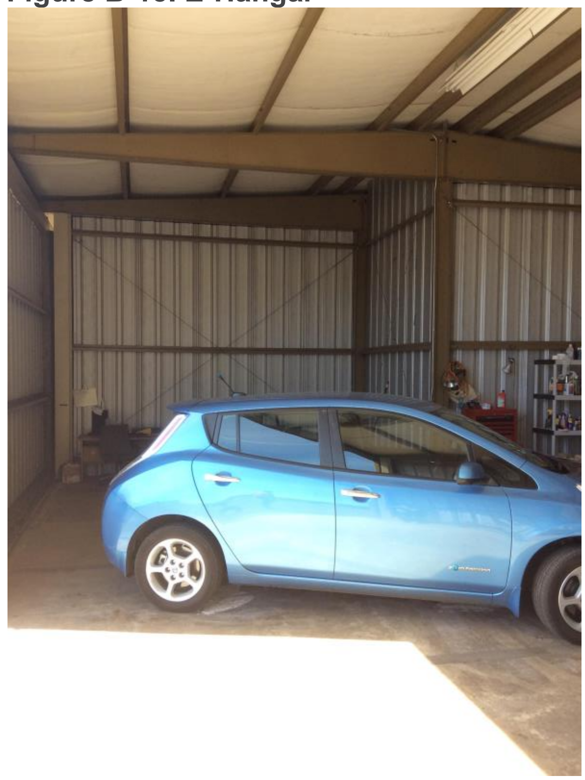
Figure B-13. D-Hangar

The Building D T-Hangars houses five multi engine aircraft T-Hangars. Built in 1984, it is a steel framed building with aluminum panels for the walls, exterior siding, roofing and doors. The multi engine hangars are approximately 1,770sf. The building is on concrete slab. The ceiling is sloped with the high point at 19’-10”. The lighting is three florescent light fixtures with two 4plex power outlets. The building dimensions are 48’ wide by 208’ long. The building condition is fair.

E-Hangars (Single T-Hangars)

Figure B-14. E-Hangar

Figure B-15. E-Hangar



The Building E T-Hangars houses seven single engine aircraft T-Hangars. Built in 1985, it is a steel framed building with aluminum panels for the walls, exterior siding, roofing and doors. The single engine hangars are approximately 1,040sf. The building is on concrete slab. The ceiling is sloped with the high point at 15' -10". The lighting is one florescent light fixtures with one duplex power outlet. The building dimensions are 45' wide by 235' long. The building condition is fair.

F-Hangars (Single T-Hangars)

Figure B-16. F-Hangar

Figure B-17. F-Hangar

Building F T-Hangars houses eight single engine aircraft T-Hangars. Built in 1995, it is a steel framed building with aluminum panels for the walls, exterior siding, roofing and doors. The building is on concrete slab. The building dimensions are 48’ wide by 123’ long. The building condition is fair. The building was locked and inaccessible to survey.

G-Hangars (Single T-Hangars)

Figure B-18. F-Hangar

Figure B-19. F-Hangar

Building G T hangars houses five single engine aircraft hangars and 2 storage units. Built in 1995, it is a steel framed building with aluminum panels for the walls, exterior siding, roofing and doors. The single engine hangars are approximately 960sf. The building is on concrete slab. The ceiling is sloped with the high point at 13’ -1”. The lighting is two incandescent light fixtures with one duplex power outlet. The building dimensions are 45’ wide by 123’ long. The building condition is fair.

H-Hangars (Single T-Hangars)

Figure B-20. F-Hangar

Figure B-21. F-Hangar

Building H T hangars houses five single engine aircraft hangars and two storage units. Built in 1995, it is a steel framed building with aluminum panels for the walls, exterior siding, roofing and doors. The single engine hangars are approximately 960sf. The building is on concrete slab. The ceiling is sloped with the high point at 13'-9". The lighting is two incandescent light fixtures with one duplex power outlet. The building dimensions are 48' wide by 123' long. The building condition is fair.

South Corporate Hangars

Figure B-22. Building 2311

Figure B-23. Building 2321

Figure B-24. Building 2331

Figure B-25. Building 2341

Figure B-26. Building 2351

Figure B-27. Building 2361

Figure B-28. Building 2371

Figure B-29. Building 2381

Figure B-30. Building 2391

Access to the South corporate hangars was not permitted for the survey. Only a visual inspection from the exterior could be conducted. The south hangars were constructed between 1980 to 1988 except for buildings 2361, 2381, 2391 which were constructed in 1994, 1996, 2000 respectively. The building's condition, from exterior inspection, ranged from fair to good. The southern portion of the airport allows for little expansion with demolition of some current buildings.

Building 2311, built in 1985, is a pre-engineered metal building with an arched roof. The building hangar has a bi-fold vertical lift door. The building's dimensions are 35' wide X 65' long for a square footage of 2,275sf.

Building 2321, built in 1986, is a pre-engineered metal building with a low slope metal roof. The building hangar has a bi-fold vertical lift door. The building's dimensions are 80' wide X 80' long for a square footage of 6,400sf.

Building 2331, built in 1983, is a pre-engineered metal building with a low slope metal roof. The building hangar has a bi-fold vertical lift door. The building's dimensions are 80' wide X 80' long for a square footage of 6,400sf.

Building 2341, built in 1980, is a pre-engineered metal building with a low slope metal roof. The building hangar has a multi-fold horizontal sliding door. The building's dimensions are 80' wide X 80' long for a square footage of 6,400sf.

Building 2351, built in 1988, is a pre-engineered metal building with a low slope metal roof. The building hangar has a vertical lift door. The building's dimensions are 50' wide X 75' long for a square footage of 3,750sf.

Building 2361, built in 1994, is a pre-engineered metal building with a low slope metal roof. The building hangar has a multi-fold horizontal sliding door. The building's dimensions are 80' wide X 75' long for a square footage of 6,000sf.

Building 2371, built in 1982, is a pre-engineered metal building with a low slope metal roof. The building hangar has a bi-fold vertical lift door. The building's dimensions are 78' wide X 78' long for a square footage of 6,084sf.

Building 2381, built in 1996, is a pre-engineered metal building with a low slope metal roof. The building hangar has a bi-fold vertical lift door. The building's dimensions are 80' wide X 80' long for a square footage of 6,400sf.

Building 2391, built in 2000, is a pre-engineered metal building with a low slope metal roof. The building hangar has a bi-fold vertical lift door. The building's dimensions are 80' wide X 80' long for a square footage of 6,400sf.

B.3 NORTH APRON BUILDINGS

I-Hangars (Single T-Hangars)

Figure B-31. I-Hangar

Figure B-32. I-Hangar

The Building I T-Hangars houses eighteen single engine aircraft T-Hangars and two storage units. Built in 2007, it is a steel framed building with aluminum panels for the walls, exterior siding, roofing and doors. The single engine hangars are approximately 1,010sf. The building is on concretes slab. The ceiling is sloped with the high point at 17’-1”. The lighting is one florescent light fixtures with one duplex power outlet. The building dimensions are 50’ wide by 400’ long. A wash rack area is located on the northern end of this building. The building condition is good.

J-Hangars (Twin T-Hangars)

Figure B-33. J-Hangar

Figure B-34. J-Hangar

The Building J T-Hangars houses seven multi engine aircraft T-Hangars and two storage units. Built in 2007, it is a steel framed building with aluminum panels for the walls, exterior siding, roofing and doors. The multi engine hangars are approximately 1,775sf. The building is on concrete slab. The ceiling is sloped with the high point at 19' -10". The lighting is two florescent light fixtures with one duplex power outlet. The building dimensions are 50' wide by 300' long. The building condition is good.

North Corporate Hangars

Figure B-35. Building 2775

Figure B-36. Building 2787

Figure B-37. Building 2797

Figure B-38. Building 2825

Figure B-39. Building 2777

Figure B-40. Building 2785

Figure B-41. Building 2805

Figure B-42. Building 2815

Figure B-43. Building 2795

Building 2775, built in 2007, is a pre-engineered metal building with a low slope metal roof. The building hangar has a vertical lift door. The building's dimensions are 80' wide X 80' long for a square footage of 6,400sf.

Building 2777, built in 2000, is a pre-engineered metal building with a low slope metal roof. The building hangar has a two roll up doors, across from one another, on the east and west sides of the building. A second, high roll up door on the west side serves vehicle entry. The building's dimensions are 60' wide X 80' long for a square footage of 4,800sf.

Building 2785, built in 2007, is a pre-engineered metal building with a low slope metal roof. The building hangar has a vertical lift door on the west side and a smaller roll up door on the east side. The building's dimensions are 80' wide X 80' long for a square footage of 6,400sf.

Building 2787, built in 2007, is a pre-engineered metal building with a low slope metal roof. The building hangar has a bi-fold vertical lift door. The building's dimensions are 100' wide X 100' long for a square footage of 10,000sf.

Building 2795, built sometime after 2006, is a pre-engineered metal building with a low slope metal roof. The building hangar has a bi-fold vertical lift door. The building also has a vehicular roll up door on the east side. The building's dimensions are 80' wide X 80' long for a square footage of 6,400sf.

Building 2797, built sometime after 2006, is a pre-engineered metal building with a low slope metal roof. The building hangar has a bi-fold vertical lift door. The building's dimensions are 80' wide X 130' long for a square footage of 10,400sf.

Building 2805, built sometime after 2006, is a pre-engineered metal building with a low slope metal roof. The building hangar has a bi-fold vertical lift door. The building's dimensions are 80' wide X 80' long for a square footage of 6,400sf.

Building 2815, built sometime after 2006, is a pre-engineered metal building with a low slope metal roof. The building hangar has a bi-fold vertical lift door. The building's dimensions are 80' wide X 80' long for a square footage of 6,400sf.

Building 2825, built in 2006, is a pre-engineered metal building with a low slope metal roof. The building hangar has a bi-fold vertical lift door. The building's dimensions are 100' wide X 120' long for a square footage of 12,000sf.

APPENDIX C:

ENVIRONMENTAL OVERVIEW

ROSEBURG REGIONAL AIRPORT
APPENDIX C: ENVIRONMENTAL OVERVIEW

INTRODUCTION

Environmental Science Associates (ESA) completed a review of environmental issues and conditions at and in the vicinity of the Roseburg Regional Airport in support of the development of the Master Plan. This appendix summarizes the Environmental Overview, which is presented in the following sections.

- Air Quality
- Historical, Architectural, Archaeological, and Cultural Resources
- Section 4(f) Property
- Threatened and Endangered Species
- Water Quality
- Wetlands
- Farmland
- Floodplains

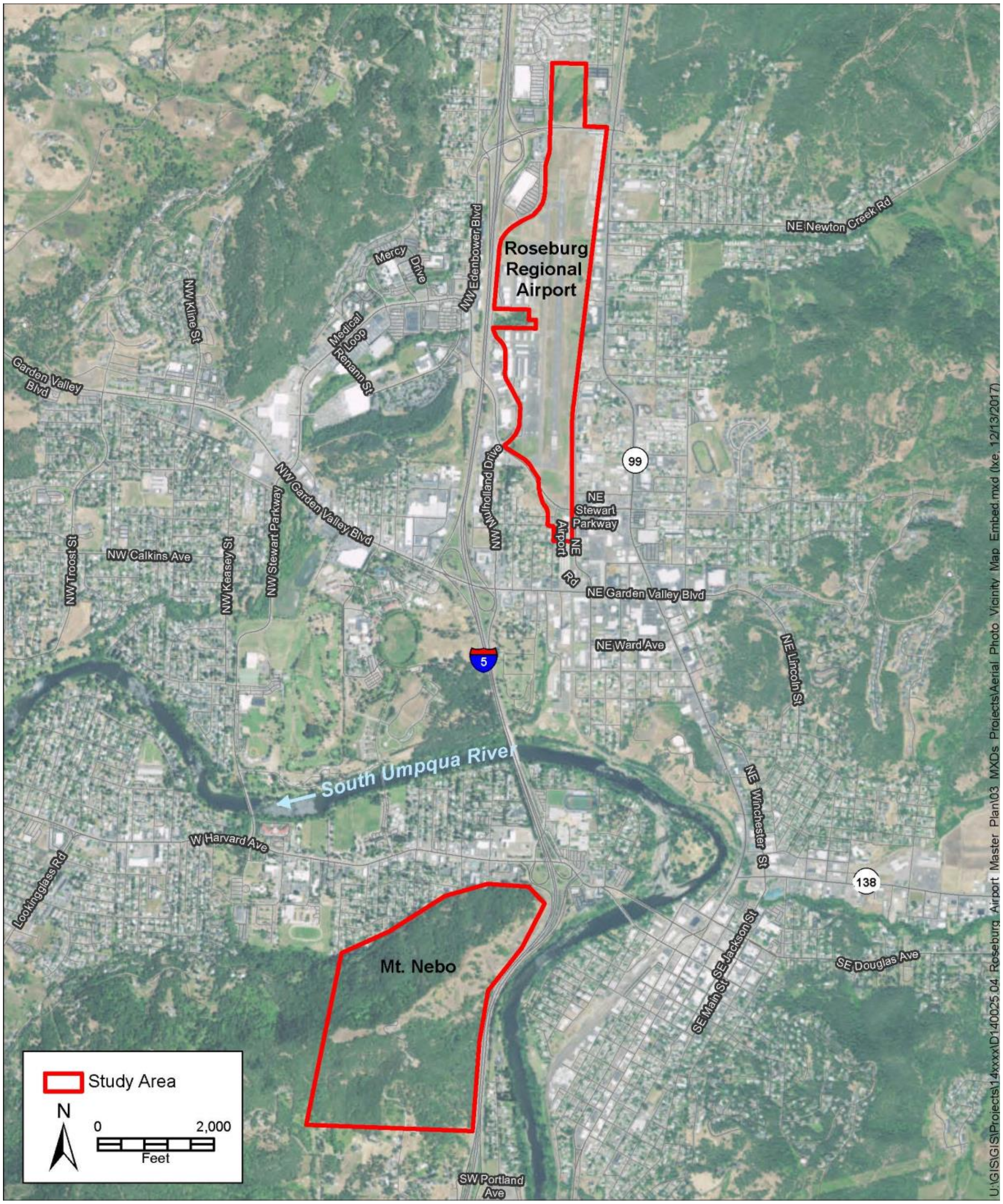
The environmental subject areas addressed in this Environmental Overview correlate with key environmental impact categories identified in Federal Aviation Administration (FAA) Order 1050.1F, which documents FAA policy and procedures for compliance with the National Environmental Policy Act (NEPA). These and other impact categories not addressed in this overview but also identified in 1050.1F (e.g., Visual Resources, Hazardous Materials, Solid Waste, and Pollution Prevention) may warrant further analysis during future NEPA reviews for recommended Airport projects.

The purpose of this Environmental Overview is to identify known constraints that will require attention should recommended Airport improvement projects proceed. It is not intended to be a comprehensive, detailed analysis of environmental issues for specific projects and is not intended to satisfy NEPA requirements or FAA's *NEPA Implementing Instructions for Airport Actions* contained in FAA Order 5050.4B.

Our evaluations for all subject areas included reviewing available data and documentation for the Roseburg Regional Airport Study Area and the Mt. Nebo Study Area, as defined by Mead & Hunt and shown on **Figure C-1** (Aerial Photo Vicinity Map). The Mt. Nebo Study Area was included with the Airport Study Area in this review due to ground and tree penetrations of the Instrument Approach Procedure (IAP) 20:1 Visual Surface for Runway 34 in that area, as identified by the FAA office of Air Traffic Organization (ATO) in 2015.

In addition, the review for historic and cultural resources included reviewing records for areas within a one-mile radius of the center of the airport and Mt. Nebo study areas, as shown on **Figure C-2** and **Figure C-3**. Field surveys were not part of our review for any subject.

FIGURE C-1: AERIAL PHOTO VICINITY MAP



C.1 AIR QUALITY

The federal Clean Air Act, last amended in 1990, requires the U.S. Environmental Protection Agency (EPA) to establish National Ambient Air Quality Standards (NAAQS) for pollutants considered harmful to the environment and to public health. The EPA has established NAAQS for six criteria pollutants: carbon monoxide, lead, nitrogen dioxide, particulate matter, ozone, and sulfur dioxide.

A geographic area that has not consistently met the clean air levels set by the EPA in the NAAQS is designated a “Non-Attainment Area”. Areas with a history of non-attainment but which now consistently meet NAAQS are designated “Maintenance Areas”. The federal government cannot approve an action that is not supportive of the attainment and maintenance of NAAQS conformity. The Roseburg Regional Airport and Mt. Nebo study areas, along with all of the City of Roseburg and Douglas County, are not located in a NAAQS Non-Attainment or Maintenance area for the State of Oregon (DEQ, 2017a and 2017b).

The Oregon Department of Environmental Quality (DEQ) has responsibilities and authorities in Oregon for enforcing air quality regulations, issuing permits, and monitoring and reporting on NAAQS pollutants. Air Quality Index (AQI) data for the monitoring station in Roseburg, which monitors particulate matter (PM 2.5), showed air quality to be “good” for 326 days and “moderate” for 35 days in 2015, the most recent year published in an annual report (DEQ, 2016). The 2015 data showed only one day with air quality considered “unhealthy for sensitive groups”, due to forest fire activity (DEQ, 2016).

C.2 HISTORICAL, ARCHITECTURAL, ARCHEOLOGICAL, AND CULTURAL RESOURCES

ESA examined the conditions for the historical, architectural, archaeological, and cultural resources (collectively referred to hereafter as "cultural resources") in the Roseburg Regional Airport Study Area and Mt. Nebo Study Area (**Figure C-2** and **Figure C-3**). Cultural resources can be archaeological sites, buildings, structures, or objects. ESA reviewed the Oregon State Historic Preservation Office's (SHPO) Oregon Archaeological Records Remote Access database, the Oregon Historic Sites database, and ESA's research library. Additionally, ESA reviewed ethnographic studies, historical maps, government landowner records, aerial photographs, regional histories, geological maps, soils surveys, and environmental reports pertaining to a one-mile radius from the center points of the Roseburg Regional Airport Mt. Nebo study areas (**Figures C-2** and **Figure C-3**). No fieldwork was conducted.

C.2.1 APPLICABLE REGULATIONS

The following state laws protect archaeological sites and cultural resources in Oregon: Indian Graves and Protected Objects (ORS 97.740-97.760) and Archaeological Objects and Sites (ORS 358.905-358.961). Under ORS 358.653, the City is required to consult with the SHPO to avoid inadvertent impacts to historic properties for which they are responsible; this relates primarily to buildings and structures which are listed or eligible for listing on the National Register of Historic Places. Generally, eligible historic properties are at least 50 years old, retain their historic appearance, and meet one of four National Register significance criteria. Based on a property inventory provided by Mead & Hunt (2017), there are no properties in the airport study area that meet these criteria.

C.2.2 GEOLOGICAL SETTING

This section discusses the geological setting of the Roseburg Regional Airport and Mt. Nebo study areas as it pertains to the likelihood and nature of cultural resources existing within the property boundaries.

The Roseburg Regional Airport and Mt. Nebo study areas are located in the Klamath Mountains physiographic province, which consists of rugged, deeply dissected terrain among some of the oldest bedrock in Oregon (Franklin and Dyrness 1988). Mountains and hills surrounding the study areas are approximately 50 to more than 60 million years old (Wells et al. 2000). The most extensive bedrock type consists of Late Paleocene to Early Eocene submarine basalt, which occurs as pillow lava, columnar jointed sheet flow, and pillow breccia aphryic to plagioclase phryrictheoleiitic basalt.

The airport study area is in a generally flat, interior river valley underlain by Holocene-aged alluvial deposits consisting of unconsolidated to poorly consolidated river deposits. Adjacent is a small area of near-surface basalt bedrock present southwest of NW Stewart Parkway. Also nearby is Early Eocene Slater Creek Member sandstone, which is a shallow-marine fine-grained sandstone containing broken fossil mollusks; this unit appears west of NW Stewart Parkway. A second area occurs in the northeast corner of the airport study area along NW Edenbower Road, where quarry operations were conducted historically. Based on its age and environment of deposition, Holocene alluvium has the potential to contain deeply buried intact archaeological resources across the airport study area.

The Mt. Nebo study area is underlain by Late Paleocene to Early Eocene submarine basalt. The dominant geomorphic processes at work in the area are in situ weathering of bedrock and gravity-driven mass movement (colluviation) along the prevalent slopes. Depth to bedrock tends to be relatively shallow, with paralithic or lithic contact occurring between a few inches to 3-4 feet below surface. The geomorphic processes at work within the Mt. Nebo study area are generally not favorable to preserving intact archaeological sites. In the absence of exogenous deposition, deposited cultural materials would tend to remain unburied at the ground surface, and would be subject to erosion and downslope movement. However, in very localized settings, it is possible that upslope sediments may have overridden, covered, and thus protected archaeological remains, if present.

C.2.3 CULTURAL SETTING

People have been living along the Umpqua River since at least 3,000 years before present (Ross 1990:555). The Roseburg area is within the traditional lands of the etnémi-tenéyu (Upper Umpqua) people (Berreman 1936; Miller and Seaburg 1990). Minimal ethnographic studies were conducted among the Upper Umpqua resulting in a lack of known village sites and utilization areas. However, there is archaeological evidence that the Upper Umpqua lived and utilized the area that is now Roseburg. The Upper Umpqua were severely impacted by disease and conflicts with non-Native people, who traveled through the area beginning in 1826. The Oregon-California Trail passed through today's Roseburg (**Figure C-4**). Non-Native settlement of the Roseburg area began in the 1850s.

The Roseburg Regional Airport is within the homesteads of Joseph and Polly Lane, Margaret and Nedom Imbler, and Isaac and Anna Jones. Joseph Lane was Oregon Territory's first governor and was involved in many notable historical events (Beckam 1990; Blue 2017). His homestead cabin was located northwest of the Roseburg Regional Airport, the Joneses lived southwest of the Airport, and the location of the Imblers' residence is unknown (US Surveyor General 1853). The Mt. Nebo study area is within the donation land claims of John Leiser, Sarah and Thomas Owens, Jeremiah Huntley, Samuel Gordon, and Elizabeth Kelly. None of these early landowners appear to have occupied or modified the study area (US Surveyor General 1853).

In 1852, explorers found gold along the Rogue River. The road passing through Roseburg led to the mines and was immediately east of the Roseburg Regional Airport; a smaller trail veered off from the main road to pass directly across what is now the Airport (US Surveyor General 1853). Another trail led into Roseburg from the west, skirting the northern base of Mt. Nebo. Prospectors led massacres against the Native people in the area during a series of events known today as the Rogue River Wars. Surviving Upper Umpqua were assigned to be forcibly removed to the Grand Ronde and Siletz Reservations under an 1854 treaty.

Roseburg is named after settler Aaron Rose whose land claim was east of Mt. Nebo on the opposite side of the river. In 1872 the Oregon and California Railroad constructed its line through Roseburg, connecting the town with Portland, and then in 1884 the line was extended south to Ashland. The rail alignment abuts the eastern boundary of the Roseburg Regional Airport (USGS 1897). Early industries within the study areas were farming, mining, and logging (Abdill 2017).

Constructed in 1928 by the City, Roseburg Regional Airport is one of Oregon's oldest airports (Oregon Department of Aviation 2008). From 1935 until 1947 the US Department of Commerce, Bureau of Air Commerce operated the Airport. During World War II the runway was graveled and a fixed-base operator was added. In 1950 the City purchased additional property and extended and paved the runway. Nine years later, the City removed the original hangar and office buildings, which once stood on the northeast end of the runway, and constructed new buildings and structures on the southwest side of the airport instead. The City also constructed a paved taxiway parallel with the runway (USGS 1955; Mead & Hunt 2011).

Today's Roseburg Regional Airport boundaries include the site of a former mobile home park on the west side of the property; the park was established before 1987 and demolished in 2006. This location was formerly an orchard (USGS 1955; 1987).

There has been minimal development on Mt. Nebo apart from construction of the Airway Beacon sometime before 1955 (USGS 1897, 1900, 1955). The study area is comprised of over 10 different parcels of various private ownership including individuals, the Elks-Roseburg Lodge No 326, Garden

Valley Christian Assembly, Oregon TV LLC, Broadcast Management, and 736 West Military LLC. Two residential buildings are located on Mt. Nebo, one built in 1999 and the other in 2003. Several trails are present along the ridgetop and leading down the northwest side of the mountain. Fairhill Road leads up the south side of the mountain to terminate at the Airway Beacon.

During the 1960s and 1970s a herd of wild goats lived on Mt. Nebo; the goats achieved national fame after residents claimed they could predict the weather with a 90% accuracy based on which part of the mountain the goats were roaming (Bain 2016). Part of the east side of the mountain was removed during construction of Interstate 5. The goats were attracted to the grass along the freeway and after several were killed by automobiles, the herd was removed in 1979.

C.2.4 PREVIOUS INVESTIGATIONS AND KNOWN CULTURAL RESOURCES

Roseburg Regional Airport Study Area

Three cultural resources investigations have been conducted within the boundaries of Roseburg Regional Airport (**Table C-1**). One occurred at the south end near NE Channon Ave (Follansbee 1977) and the other two at the north end of the property (Buchanan and Reese 2009, 2010). In 2009 one precontact-era isolated artifact, a cryptocrystalline silicate flake, was identified between 20 and 30 cm below surface within 16 feet of Newton Creek. It was found in previously disturbed soils and no additional artifacts were identified in surrounding shovel test probes. The 1977 investigations did not identify any cultural resources, nor did the 2010 investigation; however, the 2010 investigation was pedestrian survey only and did not include any subsurface testing.

The nearest recorded cultural resources are approximately one mile from the airport study area (Neuzil and Heppner 2016; Pettigrew 1985). To the northwest is one precontact-era site and one historic-era site associated with the Joseph Lane homestead (Pettigrew 1985); neither has been evaluated for NRHP eligibility. To the northeast along Newton Creek are four resources: a precontact-era lithic scatter which is unevaluated, and several isolated finds, none of which are considered eligible (Neuzil and Heppner 2016).

One recorded cultural resource is adjacent to the Roseburg Regional Airport, in the Oregon Department of Transportation's parking lot at 3500 NW Stewart Parkway. It is a relocated large basalt boulder (35-DO-1170). While recorded as an archaeological site, the rock is not in its original location. It is incised with "1889 ROAD SURVEYORS CAMPED FEB 28 TO M" (Bochart-Leusch 2009). The origin of the rock is not precisely known, but researchers suggest it was removed from somewhere along Coos Bay-Roseburg Highway 42, possibly at milepost 48.5 which is outside of Roseburg city limits (Bochart-Leusch 2009).

Mt. Nebo Study Area

No cultural resources investigations have been carried out within the Mt. Nebo study area boundaries; however, 24 surveys have been conducted within a one-mile radius of the center of the Mt. Nebo study area. These were prepared in association with transportation projects, park improvements, and development.

No archaeological resources are recorded within the Mt. Nebo study area boundaries; however, 16 sites have been identified within a one-mile radius of the study area. These resources date to the precontact and historic-era and are located along both sides the river. To the southeast of Mt. Nebo are two large precontact-era sites and multiple sites are located to the northwest of Mt. Nebo near the Roseburg Municipal Golf Course and Riverfront Park. The precontact-era sites are villages, lithic scatters, and possible camps. The historic-era sites are refuse deposits, isolated domestic artifacts, and the location of the 1959 Roseburg Blast site.

C.2.5 PROPERTY INVENTORY AND EVALUATION AT THE ROSEBURG REGIONAL AIRPORT

Mead & Hunt prepared an inventory of existing properties on the Roseburg Regional Airport property in October 2017 (Mead & Hunt, 2017). A total of 10 properties were identified (**Table C-2**). Based on information provided by Mead & Hunt and the Airport, none are over 50 years in age and as such, they are all too recent for consideration as potential historic properties under the criteria for listing in the National Register of Historic Places. The oldest property is the Maintenance and Lear Hangar, constructed in 1984.

FIGURE C-2: ROSEBURG REGIONAL AIRPORT STUDY AREA

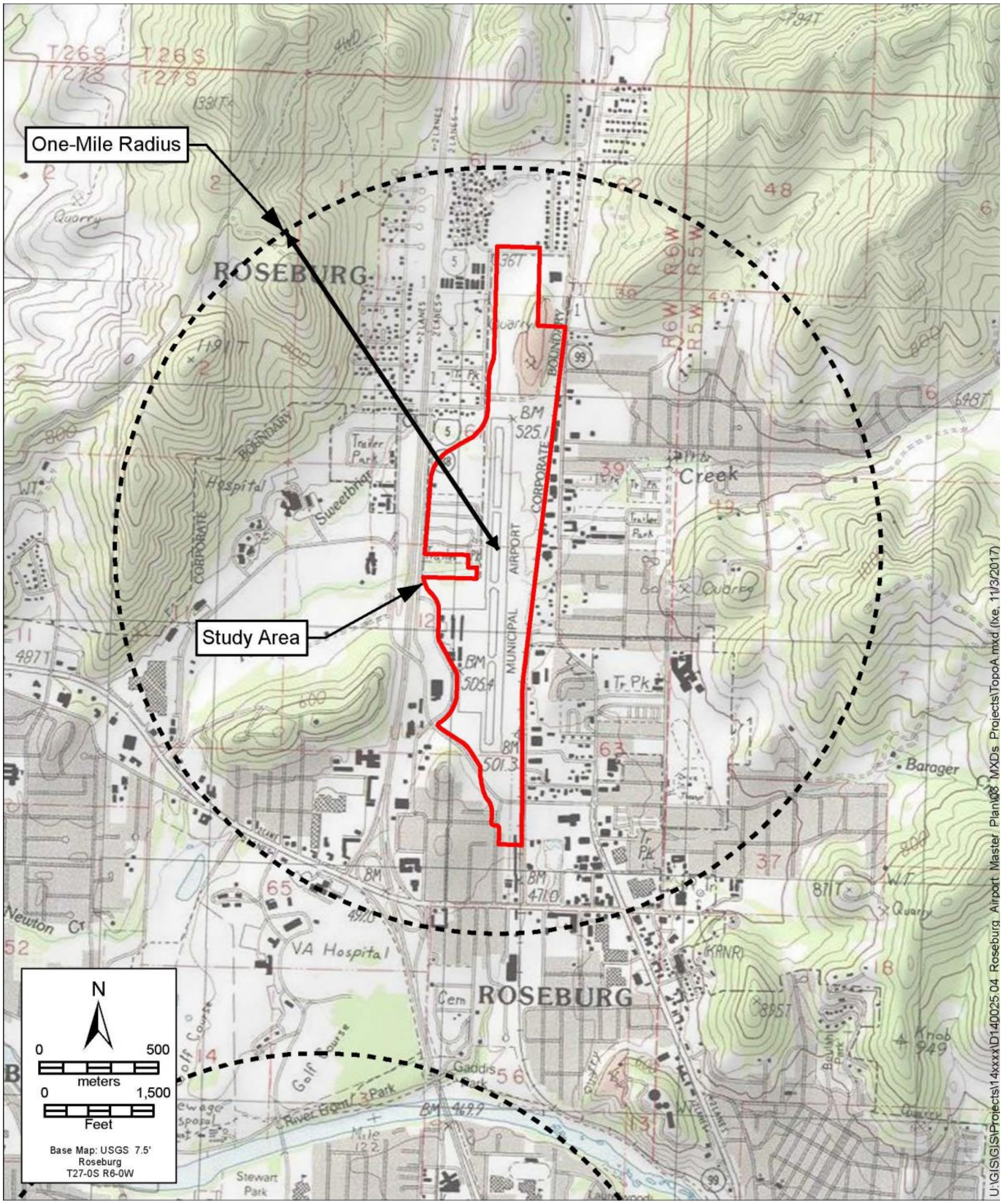


FIGURE C-3: MT. NEBO STUDY AREA

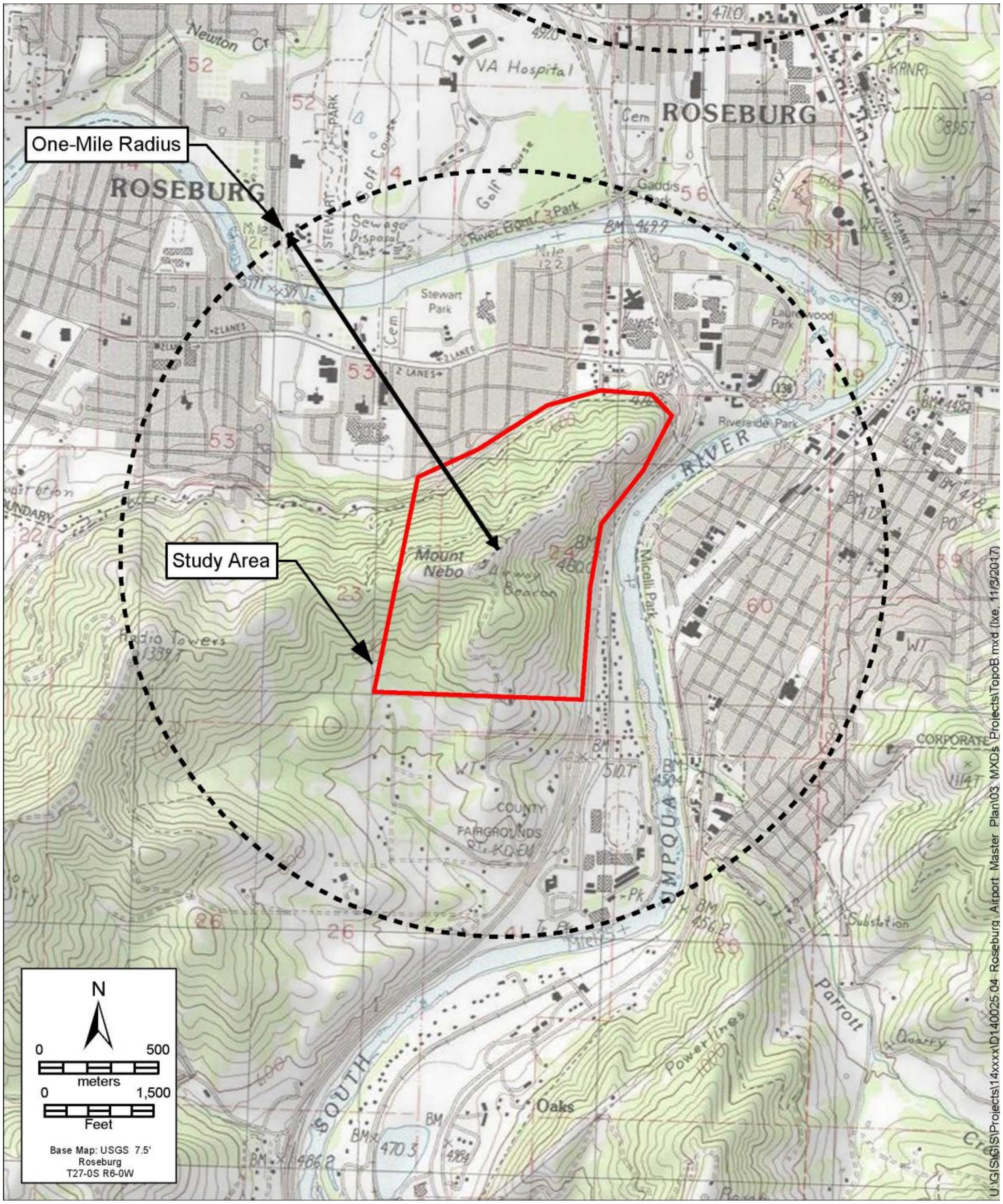


FIGURE C-4: 1853 HISTORICAL MAP OF STUDY AREAS

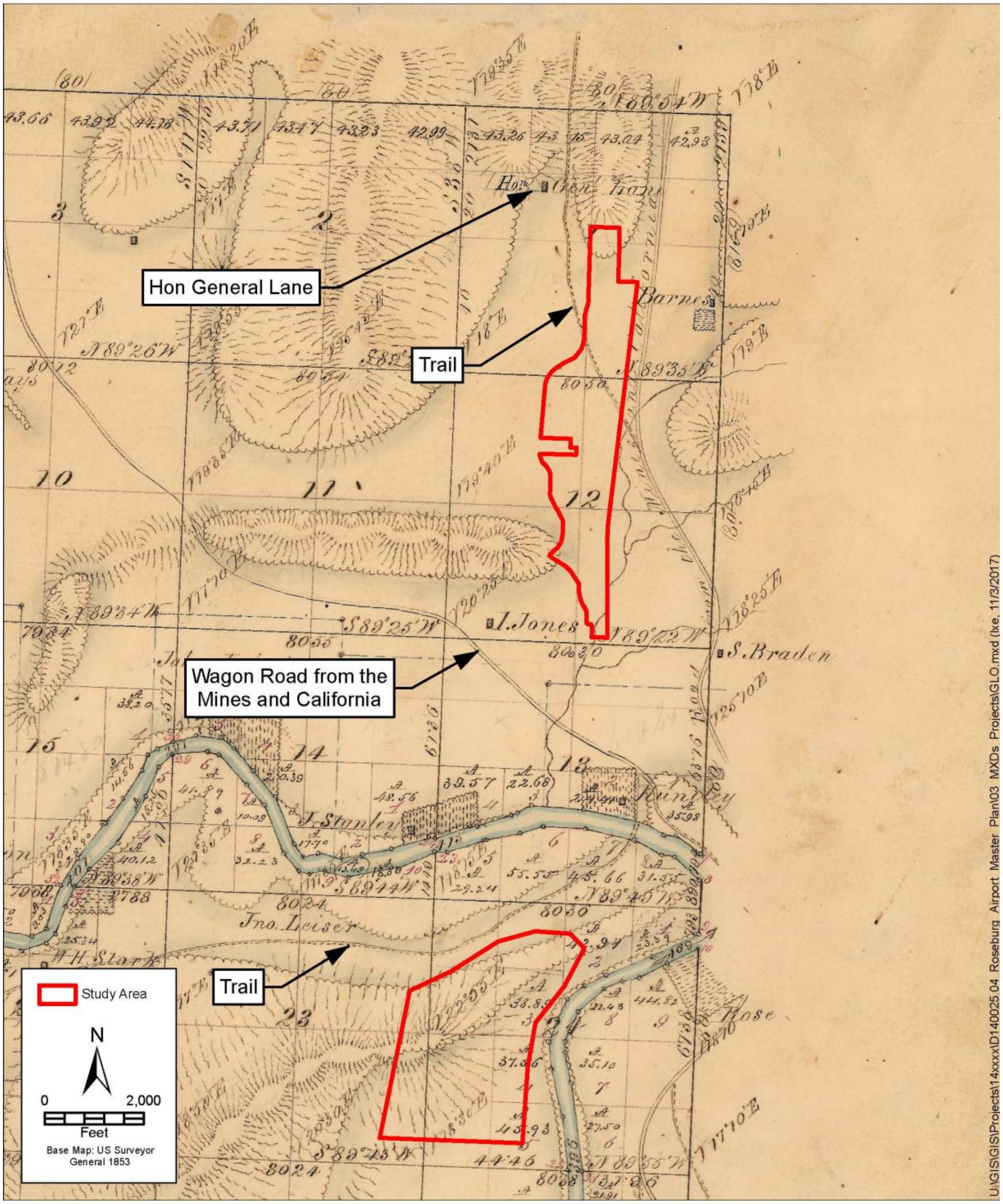


TABLE C-1: PRIOR INVESTIGATIONS WITHIN OR ABUTTING THE AIRPORT STUDY AREA

Distance from Airport	Cultural Resources Recorded	Project	SHPO No.	Citation
On Airport Property	---	Archaeological Survey for the Roseburg Regional Airport – Runway 16 400-Foot Extension Project	23849*	Buchanan and Reese 2010
On Airport Property	---	Archaeological Survey for the Roseburg Regional Airport Taxiway Realignment Project: Technical Report for the Environmental Assessment Phase I	23849*	Buchanan and Reese 2009
On Airport Property	---	Roseburg-Winston Water Intertie; Supplemental Report	757	Follansbee 1977
Abuts W Boundary	---	Archaeological Survey of the I-5: Sutherlin to Roseburg Section Design-Build Project	20292	McClintock 2005

*These reports were submitted to Oregon SHPO as one file and assigned the same report number.

TABLE C-2: INVENTORIED AIRPORT PROPERTIES

Building Name	Apron	Year Constructed	Age
Maintenance & Lear Hangar	South	1984	33 years
T-Hangar B	South	1999	18 years
T-Hangar C	South	1999	18 years
T-Hangar D	South	1984	33 years
T-Hangar E	South	1985	32 years
T-Hangar F	South	1995	22 years
T-Hangar G	South	1995	22 years
T-Hangar H	South	1995	22 years
T-Hangar I	North	2007	10 years
T-Hangar J	North	2007	10 years

C.3 SECTION 4(F) PROPERTY

Section 4(f) of the U.S. Department of Transportation (DOT) Act of 1966 protects significant publicly owned parks, recreational areas, wildlife and waterfowl refuges, and public and private historic sites. Under Section 4(f), the Secretary of Transportation may approve a transportation program or project requiring the use of such sites only if there is no feasible and prudent alternative to using that land, and the program or project includes all possible planning to minimize harm resulting from the use.

Section 4(f) properties include:

- parks and recreational areas of national, state, or local significance that are both publicly owned and open to the public;
- publicly owned wildlife and waterfowl refuges of national, state, or local significance that are open to the public; and
- historic sites of national, state, or local significance in public or private ownership regardless of whether they are open to the public.

The Roseburg Regional Airport is owned by the City of Roseburg and is considered a public facility. There are no public recreational areas or wildlife and waterfowl refuges on or adjacent to the airport study area. The Mt. Nebo study area consists exclusively of privately owned properties.

As described in more detail in the *Historical, Architectural, Archeological, and Cultural* section of this review, there are no recorded historic sites within the airport or the Mt. Nebo study areas. However, there is one recorded cultural resource that is adjacent to the Roseburg Regional Airport, located in the Oregon Department of Transportation's parking lot at 3500 NW Stewart Parkway. Additionally, there are 16 recorded sites within a one-mile radius of the Mt. Nebo study area.

C.4 THREATENED AND ENDANGERED SPECIES

The federal Endangered Species Act of 1973 provides for the protection and recovery of federally-listed Threatened and Endangered plants and animals and their habitat. It is administered by the U.S. Fish & Wildlife Service (USFWS), which is responsible for terrestrial and freshwater organisms, and the National Marine Fisheries Service (NMFS), which has responsibilities for marine wildlife, including anadromous fish.

C.4.1 U.S. FISH AND WILDELIFE SERVICE SPECIES

A list of Threatened and Endangered species with potential ranges overlapping the study areas was obtained from the USFWS (2017a) and is summarized in **Table C-3**. Additional information for each species and its potential presence in the study areas follows **Table C-3**.

TABLE C-3: USFWS Species with Ranges Overlapping Study Areas

Species Common Name (*Scientific Name*)	Listing Status	Critical Habitat
Birds		
Marbled Murrelet (*Brachyramphus marmoratus*)	Threatened	Designated. Does not include Study Areas.
Northern Spotted Owl (*Strix occidentalis caurina*)	Threatened	Designated. Does not include Study Areas.
Plants		
Kincaid's Lupine (*Lupinus sulphureus ssp. Kincaidii*)	Threatened	Designated. Does not include Study Areas.

Marbled Murrelet

The marbled murrelet is a small seabird that spends the majority of its time on the ocean, but comes inland up to 50 miles to nest in forest stands with old growth characteristics. In Oregon, such forests are typically dominated by Douglas fir trees (USFWS 2017b). The airport and Mt. Nebo study areas are located approximately 50 miles from the ocean, near the inland edge of the USFWS-mapped potential range for the species in Oregon. The undeveloped portions of the airport study area consist of low-growing vegetation, and the Mt. Nebo study area is dominated by deciduous forest, open grassland, or steep, exposed slopes. Neither study area contains suitable habitat for marbled murrelet, and the nearest designated Critical Habitat is located approximately 8 miles from the study areas (USFWS 2017c).

Northern Spotted Owl

Northern spotted owls live in conifer forests characterized by dense canopy closure of mature and old-growth trees, abundant logs, standing snags, and live trees with broken tops (USFWS 2017d). Neither the airport study area nor the Mt. Nebo study area contain suitable coniferous forest habitat for this species. The nearest designated Critical Habitat for northern spotted owl is over 10 miles from the study areas (USFWS 2017c).

Kincaid's Lupine

Kincaid's lupine is typically found in upland prairie remnants and transitions between grassland and forest (ODA, 2017). Douglas County represents the southern extent of the species' potential range. In contrast to the open prairie habitats of the more northerly Willamette Valley populations, Douglas County populations appear to be more shade tolerant and are often found at sites dominated by tree and shrub species, including Douglas fir, California black oak, Pacific madrone, ponderosa pine, incense cedar, and hairy manzanita (USFWS, 2010a).

Previous biological field investigations at the airport, including a 2010 field visit by a USFWS botanist for the airport taxiway separation project, have not identified Kincaid's lupine presence on the airport property (USFWS, 2010b). Based on the previous field investigations and lack of habitat typically suitable for this species, its presence within the airport study area is unlikely.

Records of plant surveys or other biological field investigations conducted on the private properties comprising the Mt. Nebo study area were not available for this review. Based on reviews of aerial photographs, the Mt. Nebo study area appears to contain a mix of open grassland, scattered oak trees, and densely vegetated forest dominated by deciduous trees. The potential for the presence of Kincaid's lupine cannot be ruled out based on habitat conditions alone, and a field review for plants would be appropriate prior to any development or ground-disturbing activities in this area.

C.4.2 NATIONAL MARINE FISHERIES SERVICE SPECIES

Table C-4 identifies the NMFS-managed ESA listed species with potential presence in the study area watersheds.

TABLE C-4: NMFS Species within Study Area Watersheds

Species Common Name (*Scientific Name*)	Listing Status	Critical Habitat
Fish		
Oregon Coast Coho Salmon (*Oncorhynchus kisutch*)	Threatened	Designated. Includes South Umpqua River. Does not include Newton Creek in Airport Study Area.

Oregon Coast coho salmon are present in the Lower South Umpqua River and in Newton Creek, which is a South Umpqua tributary that transects the airport study area. The City incorporated fish passage improvements into the Newton Creek culvert extension required as part of the airport taxiway separation project constructed in 2013. The culvert/fish passage project involved close City coordination with NMFS and ODFW, both of which recognize Newton Creek to be suitable habitat for Oregon Coast coho salmon. A number of juvenile coho salmon were captured in Newton Creek during fish salvage activities associated with the 2013 construction of culvert and fish passage improvements (Land and Water Environmental Services, 2013).

Sweetbriar Creek and a tributary located on the northern portion of the airport are not identified for use by Oregon Coast coho salmon (StreamNet, 2017) and are likely not accessible to Oregon Coast coho salmon due to downstream passage barriers (NMFS, 2011).

The Mt. Nebo study area includes the headwaters of one small (unnamed) mapped stream that is not identified for fish use (StreamNet, 2017), but which is a tributary of the South Umpqua River. The South Umpqua River is occupied by, and is designated Critical Habitat for, Oregon Coast coho salmon.

C.5 WATER QUALITY

The airport and Mt. Nebo study areas are within the Newton Creek-South Umpqua River watershed (6th Field HUC 171003021305). Newton Creek, which flows through the airport study area, discharges to the South Umpqua River approximately nine miles upstream of the confluence with the North Umpqua River. The Mt. Nebo study area is located near the South Umpqua River approximately 12 miles upstream of the confluence with the North Umpqua River.

The airport study area includes five stormwater drainage sub-basins that drain northwest to Sweetbrier Creek, west and southwest to Newton Creek, and south to Sleepy Hollow Creek; all three receiving streams are tributaries of the South Umpqua River. The Mt. Nebo study area includes one mapped (unnamed) stream, and runoff from the entire study area ultimately discharges to the South Umpqua River.

Stormwater discharges at the airport are regulated under a National Pollutant Discharge Elimination System (NPDES) general permit for industrial stormwater discharges (a 1200-Z permit), issued by the Oregon DEQ (Permit No. 13001). The City manages airport runoff under a Stormwater Pollution Control Plan (SWPCP) to comply with NPDES permit conditions and minimize potential impacts to downstream water quality from operations including aircraft washing, fueling, and maintenance activities.

Newton Creek is not identified in Oregon's current (2012) Water Quality Assessment Integrated Report and Database as a 303(d)-listed, water quality limited stream needing a Total Maximum Daily Load (TMDL), or as having a TMDL in place for any parameter (DEQ, 2012).

The portion of the South Umpqua River adjacent and downstream of the study areas is identified on DEQ's 303(d) list as water quality limited and needing a TMDL for arsenic, biological criteria, cadmium, and dissolved oxygen. Additionally, the Umpqua Basin TMDL addresses water quality problems for temperature, phosphorous, pH, dissolved oxygen, and aquatic weeds/algae in the portions of the South Umpqua River adjacent and downstream of the study areas (DEQ, 2012).

C.6 WETLANDS

For regulatory purposes under the Clean Water Act, the term “wetlands” means areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation adapted for life in saturated conditions. Wetlands are protected by federal and state regulations for the many functions they provide, including flood control, water quality regulation, and fish and wildlife habitat.

C.6.1 AIRPORT STUDY AREA

Approximately seven acres of freshwater wetlands were delineated within the airport property boundaries in 2010 and 2011. The wetlands were delineated in association with two separate projects: (1) a taxiway separation project, and (2) a runway/taxiway extension project. Characteristics of the delineated wetlands are summarized in **Table C-5** below. Refer also to **Figure C-5** and **Figure C-6** for a map of wetland locations.

TABLE C-5: Airport Wetlands

Wetland ID*	Size	Cowardin Class	HGM Class	Dominant Vegetation
A1	2.9 acres	Palustrine Emergent	Depressional Closed-Non-Permanently Flooded	Canada bluegrass Tall fescue American speedwell Watson’s willow-herb Curly dock
A2	1.2 acres			
B	1.4 acres			Tall fescue Common camas Creeping buttercup
3	1.5 acres		Flat	Pennyroyal Spreading rush Soft brome
4	0.04 acres			Slender rush Western buttercup
5	0.05 acres			Soft rush Spreading rush Pointed rush

**Wetland ID refers to the identifiers used in the delineation reports completed by Vigil-Agrimis (2010) and Land and Water Environment Services (2011).*

The previous wetland delineations covered specific portions of the airport and were used to support U.S. Army Corps of Engineers (USACE) and Oregon Department of State Lands (DSL) permit applications for impacts associated with the taxiway separation and runway extension projects. The

Oregon DSL issued concurrence letters for the delineated wetlands boundaries in 2010 (WD #2010-0229) and 2011 (WD #2011-2030). Those concurrence letters are valid for a period of 5 years. Further development activities on the airfield would likely warrant further wetland field investigations.

C.6.2 MT. NEBO STUDY AREA

Records of wetland delineation reports for the privately-owned properties comprising the Mt. Nebo study area were not available for this review. The Oregon DSL does not have records of Local Wetland Inventories (LWIs) on file for the City of Roseburg or Douglas County (DSL, 2017).

National Wetland Inventory (NWI) mapping from the USFWS identifies one freshwater forested/shrub wetland located in the southwestern portion of the study area, at the head of a small stream that flows southward from the study area towards the South Umpqua River (**Figure C-5**). Douglas County's Goal 5 inventory of Significant Natural Resources does not identify significant wetlands within the Mt. Nebo Study area (Douglas County, 2017a).

FIGURE C-5: STUDY AREAS WETLANDS OVERVIEW

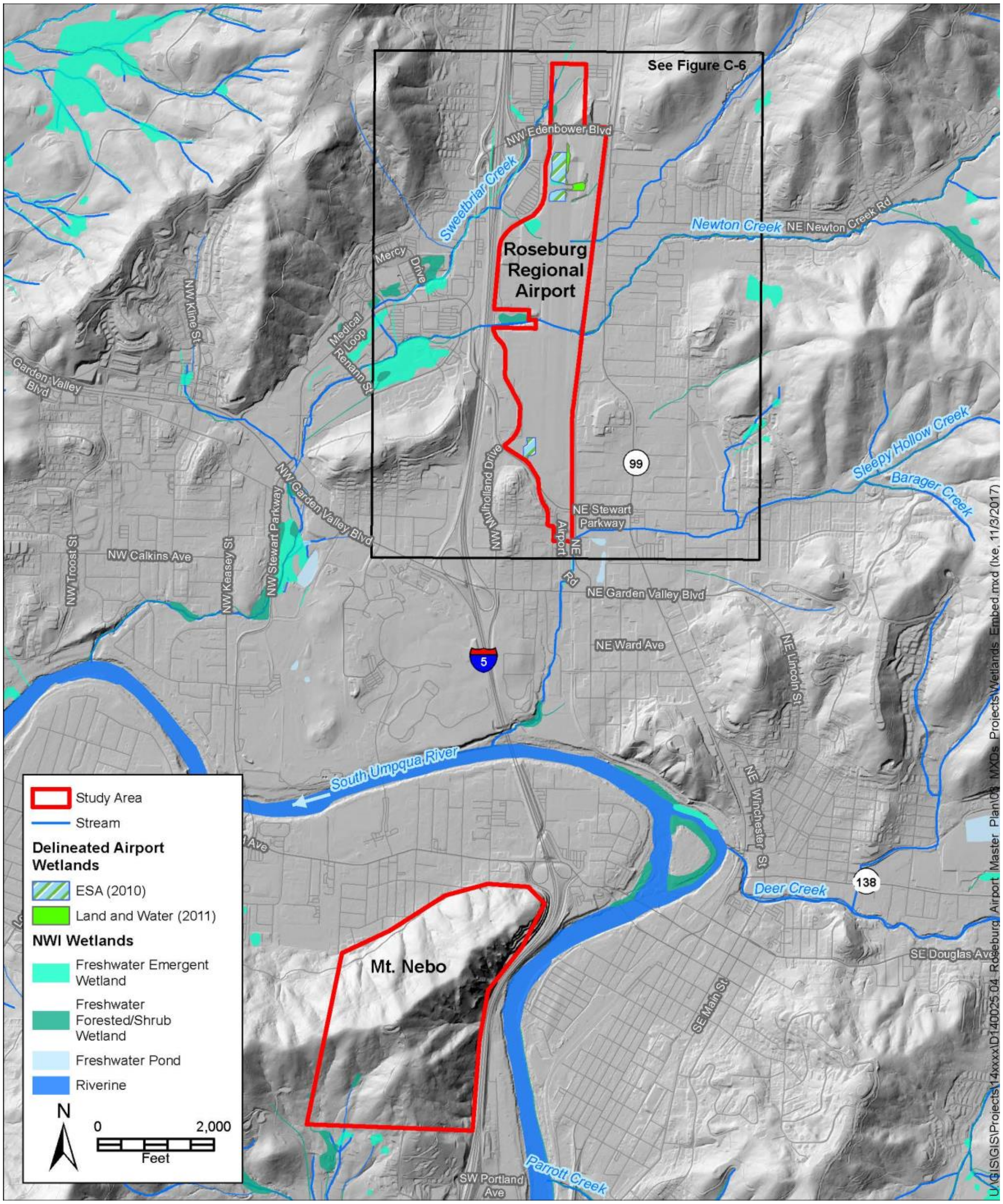
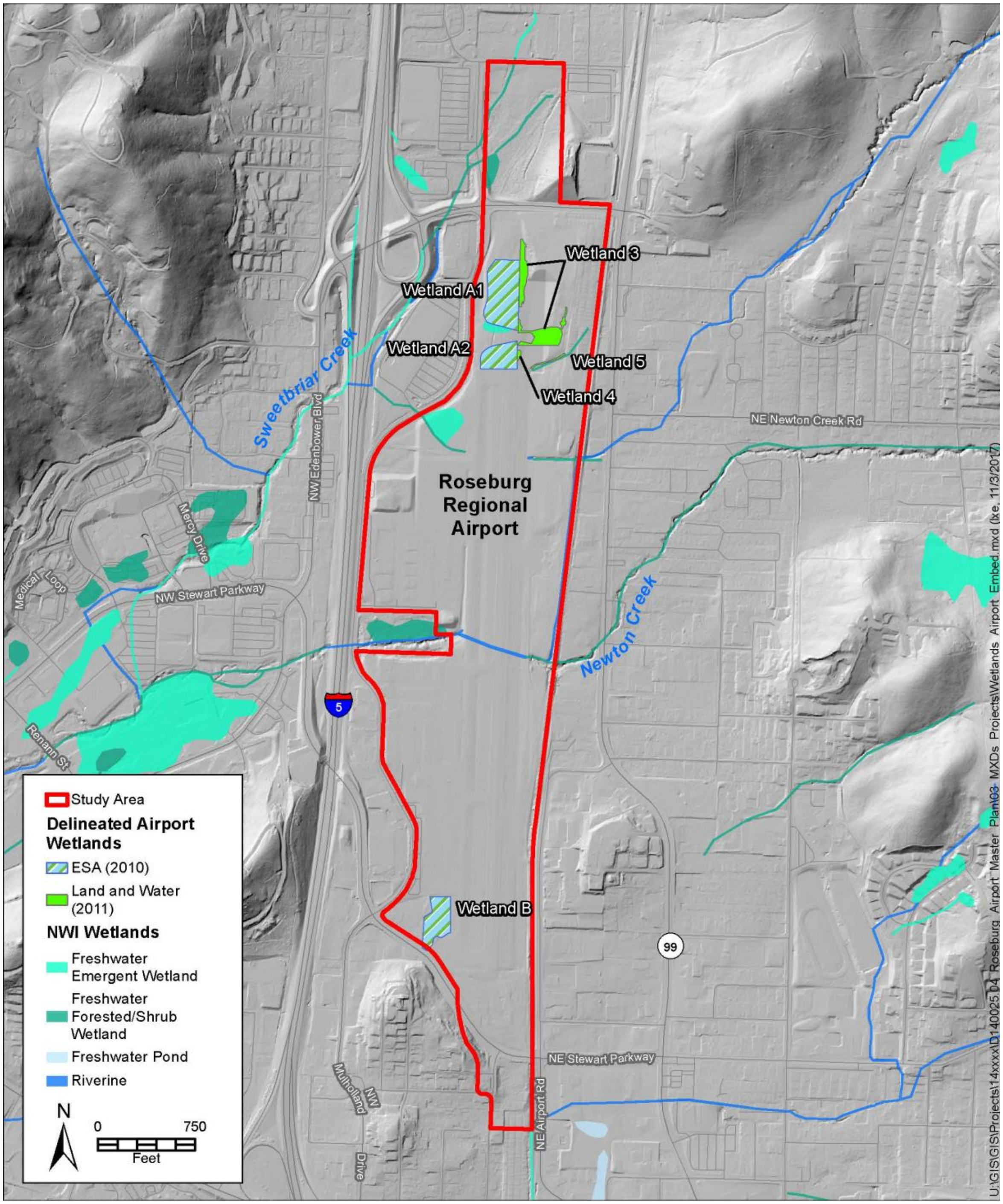


FIGURE C-6: AIRPORT STUDY AREA WETLANDS



C.7 FARMLAND

The Farmland Protection Policy Act (FPPA) is intended to minimize the impact federal programs have on the unnecessary and irreversible conversion of farmland to non-agricultural uses. The State of Oregon also has rules and programs in place requiring counties to inventory and preserve farmland through planning and zoning measures.

Natural Resources Conservation Service (NRCS) soil survey mapping and data were reviewed to determine the potential for the presence of prime, unique, state, or locally important farmland within the airport and Mt. Nebo study areas. City of Roseburg and Douglas County zoning maps were also reviewed.

The airport study area contains soil types classified as “farmland of statewide importance”, including soil map units Bashaw clay, Curtin clay, Natroy clay, and Speaker loam (NRCS 2017). However, urban and built-up areas of those soils are not considered prime or important farmland (NRCS 2017). The airport study area does not contain land that is currently used for farming or that is zoned for farm use according to the City of Roseburg’s Zoning Map (City of Roseburg, 2015).

The majority of the Mt. Nebo study area consists of soil types with no NRCS farmland classification, although the southern portion of the study area has soil types classified as “farmland of statewide importance”, including soil map units Dixonville silty clay loam, Curtin clay, and Oakland silt loam (NRCS 2017). The Mt. Nebo study area does not contain land that is currently used for farming or that is zoned for farm use according to Douglas County’s Zoning Map (Douglas County, 2017b).

C.8 FLOODPLAINS

The Federal Emergency Management Agency (FEMA) administers the National Flood Insurance Program (NFIP) for the purpose of reducing the impact of flooding on private and public structures. FEMA Flood Insurance Rate Maps (FIRMs) and digital floodplain data were reviewed for the airport and Mt. Nebo study areas.

There is a FEMA-mapped 100-year (1% annual chance) floodplain associated with Newton Creek within the airport study area, as identified on FEMA FIRM Panel 41019C1726F, effective February 17, 2010. Refer to **Figure C-7** and **Figure C-8**.

An approximately 600-foot length of Newton Creek is conveyed under the airport runway and taxiway in a culvert. The FEMA FIRM identifies a regulatory floodway along the Newton Creek channel upstream and downstream of the culvert, with areas adjacent to the channel identified as 1 percent annual chance flood hazard zones (Zone AE: an area inundated by 1% chance annual flooding, for which base flood elevations (BFEs) have been determined.)

There are no 100-year floodplains within the Mt. Nebo study area. Nearby areas to the north and east are mapped as 100-year and 500-year (0.2% annual chance) flood hazard areas of the South Umpqua River. Refer to **Figure C-7**.

FIGURE C-7: STUDY AREAS FLOODPLAINS OVERVIEW

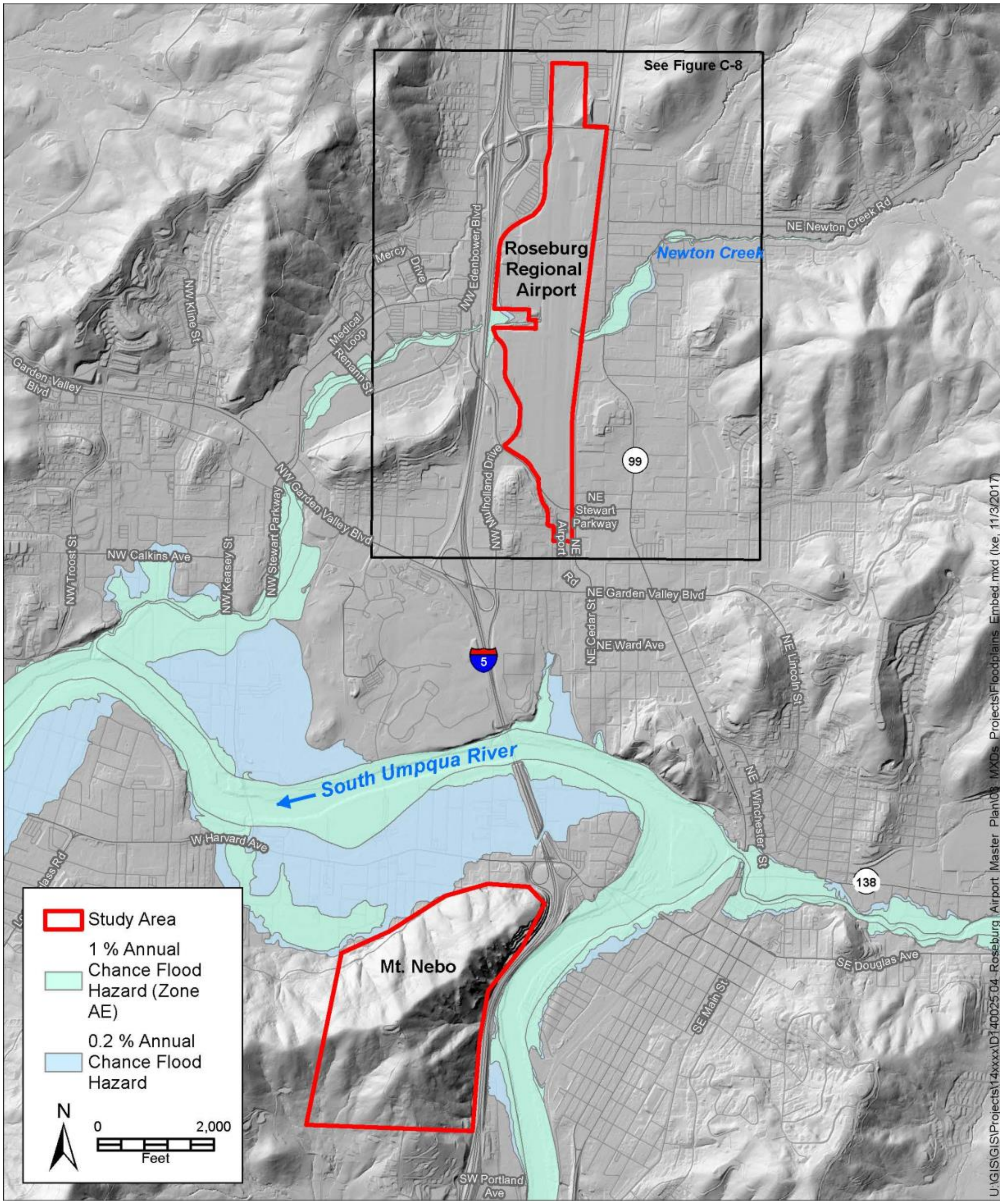
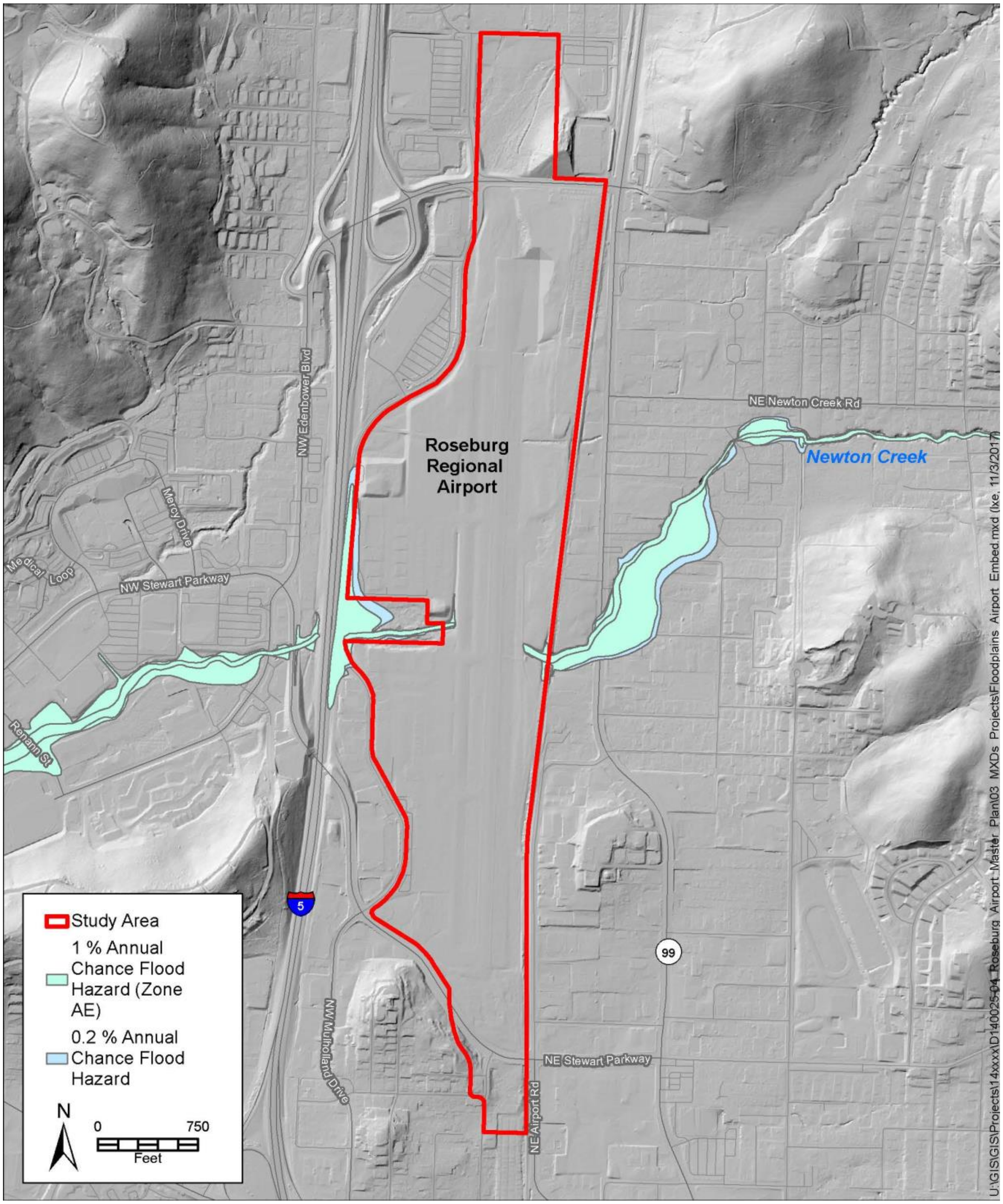


FIGURE C-8: AIRPORT STUDY AREA FLOODPLAINS



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APPENDIX D:

FAA CORRESPONDENCE

U.S. Department
of Transportation
**Federal Aviation
Administration**

Northwest Mountain Region
Seattle Airports District Office
1601 Lind Avenue S.W., Suite 250
Renton, Washington 98055-4056

April 18, 2018

Ms. Nikki Messenger
Public Works Director
City of Roseburg
900 SE Douglas Avenue
Roseburg, OR 97470

Roseburg Regional Airport (RBG)
Aviation Forecast Approval

Dear Ms. Messenger:

The Federal Aviation Administration (FAA), Seattle Airports District Office has reviewed the aviation forecast for the Roseburg Regional Airport (RBG) Master Plan Update, submitted April 17, 2108. The FAA approves these forecasts for airport planning purposes, including for Airport Layout Plan (ALP) development. The FAA approval is based on the following:

1. The difference between the FAA Terminal Area Forecast (TAF) and Roseburg Regional Airport's forecast for based aircraft and total operations is within the 10% allowance for the 5-year planning horizon and the 15% allowance for the 10-year planning horizon for reasons contained within the forecast.

2. The forecast is based on reasonable planning assumptions, current data and appropriate forecasting methodologies.

Based on the approved forecast, the FAA also approves the existing and future critical aircraft typified by the Cessna Citation Excel/XLS (RDC B-II).

The approval of the forecast and critical aircraft does not automatically constitute a commitment on the part of the Unites States to participate in any development recommended in the master plan or shown on the ALP. All future development will need to be justified by current activity levels at the time of proposed implementation. Further, the approved forecasts may be subject to additional analysis or the FAA may request a sensitivity analysis if this data is to be used for environmental or other planning purposes.

If you have any questions about this forecast approval, please call me at (206) 231-4139.

Sincerely,

Valerie R. Thorsen
Planner, FAA Seattle Airports District Office

cc: Shan Rammah, Mead & Hunt Aviation Services

U.S. Department
of Transportation
**Federal Aviation
Administration**

**Office of the Air Traffic Organization
Western Service Area**

1601 Lind Avenue Southwest
Renton, Washington 98057-3356

November 17, 2015

Pat Loegering
Roseburg Rgnl
900 SE Douglas
Roseburg, OR 97470

Dear Ms. Loegering,

The Federal Aviation Administration (FAA) reviewed the Instrument Approach Procedures (IAP) at Roseburg Rgnl, Roseburg, Oregon; KRBG and identified the obstacles that penetrate the IAP 20:1 Visual Surface for Runway 16 and Runway 34.

Please review the list of penetrations in enclosure 1 to determine if the list of obstacles we provided is valid. **Valid** would indicate you agree the obstacle is in the location and approximate height indicated. **Invalid** would indicate either the obstacle does not exist or it has been removed, lowered, lighted, or other mitigations have occurred.

We must receive your written validation of obstacles (scanned documents are acceptable) as soon as possible but no later than 30 days from this notification. In the rare case where this is not possible, you must notify us immediately. Following validation you must submit a compliance plan as outlined in each of the risk categories below. The compliance plan must be submitted to us with a copy to your Airport District Office (ADO) as soon as possible but no later than 30 days from the date we receive the obstacle validation. Specific time frames to remove, light, or lower the obstruction are indicated in each category.

After receiving your written response, or after 30 days if no response is received, the following guidance will be used in determining what type of action will be taken.

- **High Risk.** If 20:1 penetrations are verified as more than 11 feet above the 20:1 Visual Surface, action will be taken to restrict night operations. The compliance plan must indicate actions to remove, lower, or light the obstruction as soon as possible. Night restrictions must remain in place until the visual area surface penetration risk is mitigated.

- **Medium Risk.** If 20:1 penetrations are verified as more than 3 feet and up to 11 feet, no immediate action will be taken. The compliance plan must indicate action to remove, lower, or light the obstruction as soon as possible but not to exceed 180 calendar days. If penetrations are not mitigated within that time frame, action will be taken to restrict night operations.

- **Low Risk.** If 20:1 penetrations are verified as 3 feet or less no immediate action taken. The compliance plan must indicate action to remove, lower, or light the obstruction as soon as possible but not to exceed one year. If penetrations are not mitigated within that time frame, action will be taken to restrict night operations.

In situations where the options to remove, lower, or light above are not possible, with FAA approval, a commissioned Visual Glideslope Indicator (VGSI) ***may*** (with Flight Standards approval) be used to mitigate the hazard associated with the unlit obstacles. Examples of a VGSI include Precision Approach Path Indicator (PAPI) or Visual Approach Slope Indicator (VASI). If you choose to request consideration to use a VGSI, complete the attached "20:1 Obstacle Mitigation Checklist" (enclosure 2) and return it to Brandon Sutton at (425) 917-6777 or email Brandon.sutton@faa.gov.

The preferred methods for an airport owner/sponsor to update data regarding trees that have been trimmed are contained in the Office of Airports Engineering Brief (EB) #91: Management of Vegetation in the Airport Environment. EB #91 is available at the FAA website link: http://www.faa.gov/airports/engineering/engineering_briefs/. (Note: AC 150/5300-18B survey criteria only require that the highest obstruction in a 100' square be provided. Where there is a single tree shown in enclosure 1, we recommend that the adjacent trees be cut also.)

If you have any questions concerning this notification please contact the person listed above.

Your written validation of obstacles must be received by 12/19/2015.

Sincerely,

11/17/2015

X

Sam Shrimpton
Manager, Western Flight Procedures Team
Signed by: BRANDON S SUTTON

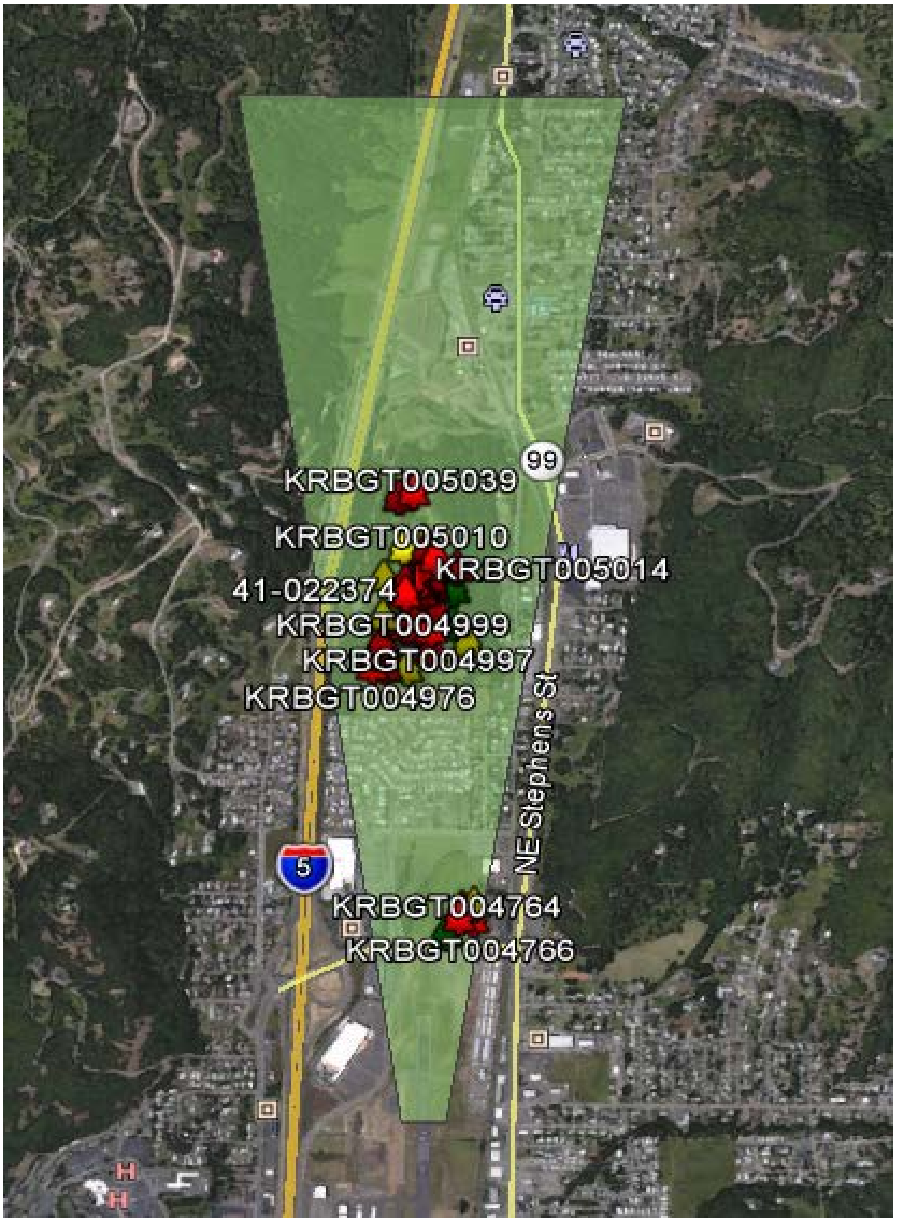
2 Enclosures
cc: Seattle Airports District Office

20:1 OBSTACLES LIST

ROSEBURG RGNL Airport /Roseburg, OR / (KRBG)

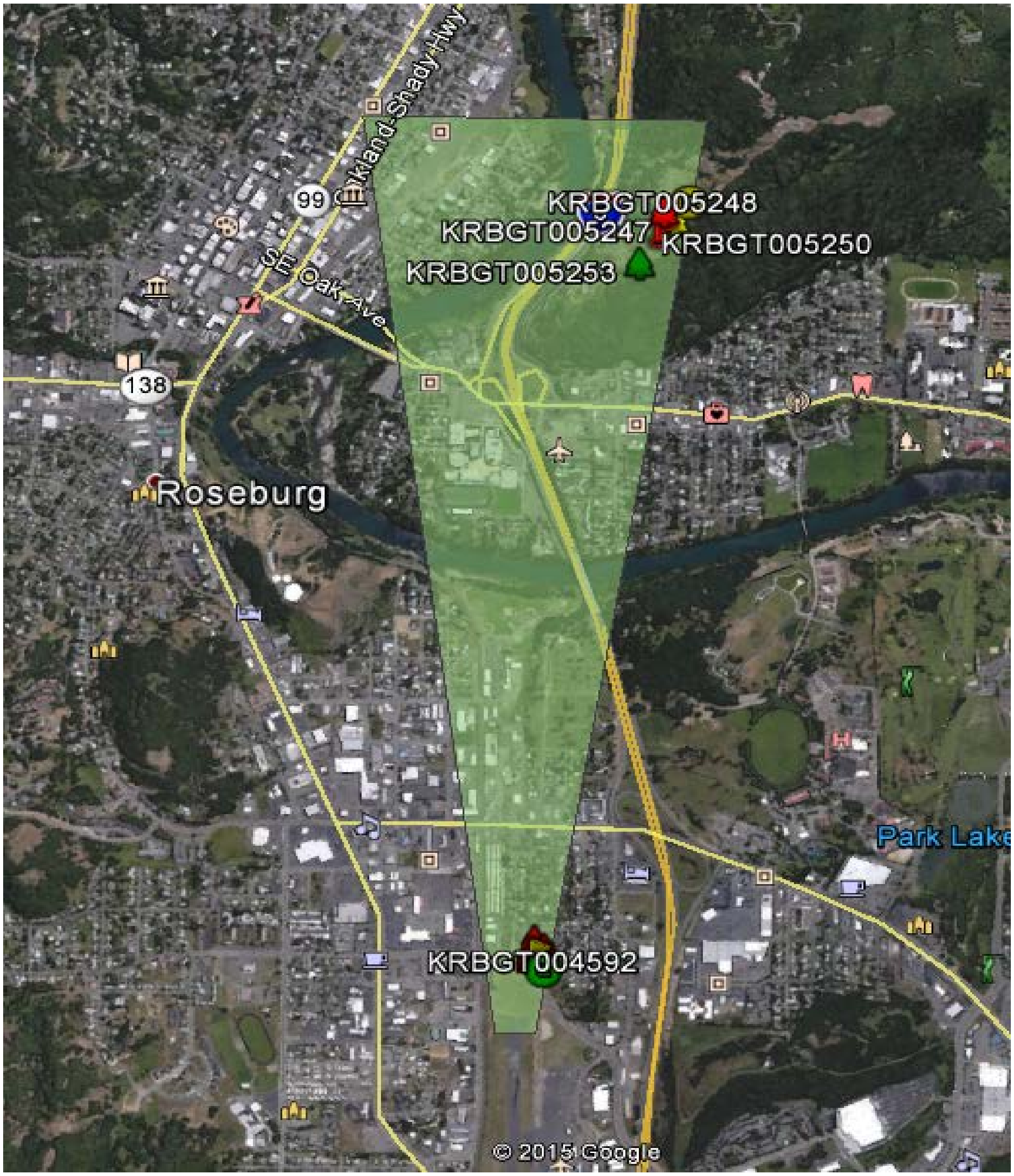
"OUT" is the distance measured along the runway centerline extended from the runway threshold.
"OVER" is the distance measured perpendicular from the runway centerline to the obstacle.
Obstacle coordinates are based on the NAD83 Datum.

Runway	OBS ID	Description	MSL	Lat/Long	Pent	Out	Over
16	See 1684.xlsx spreadsheet attached to email						



20:1 OBSTACLES LIST

Runway	OBS ID	Description	MSL	Lat/Long	Pent	Out	Over
34	See 1684.xlsx spreadsheet attached to email						



20:1 Obstacle Mitigation Request Checklist

Roseburg Rgnl
Roseburg OR
KRBG

Please review Enclosure 1, 20:1 Obstacle List, and answer the questions below.
(Use additional pages if necessary to respond)

<table>
<tr><td>1. Do you desire to retain/establish night minimums?</td><td>Yes
☐</td><td>No
☐</td><td>If “No”, skip the rest of the checklist, sign and return.</td></tr>
<tr><td>2. If you believe that the obstacle data on the attached “20:1 Obstacle List” is incorrect, please list the discrepancies and provide supporting documentation (e.g. recent airport obstacle survey data, updated Airport Layout Plan (ALP), photos, etc.)</td><td colspan="3"></td></tr>
<tr><td>3. For each obstacle, describe the plan to remove, lower, or light the obstacle. If these options are not possible, please explain why.

- Be very specific with each obstacle;
- If additional space is needed, please attach a separate sheet document. Be sure to include your RWY and Airport ID at the top of the page.

Include issues such as: reasons you cannot remove an obstacle. (e.g., tree is on private property/owner will not agree to removal, tree historical and cannot be removed/lowered, building cannot be removed, however coordination for obstacle light planned, proposed to be lighted on/before {date}, etc.).

Describe the time frame when mitigation can be completed. (e.g., tree removal on private property in litigation which can take up to 1 year before approval, contacting building owner to coordinate/plan obstacle lighting and should have approval by {date}, etc.)

Should you have a large group of trees, list the group and describe plan of action. (e.g., tree group {list trees} scheduled to be removed {date}, etc.)</td><td colspan="3"></td></tr>
</table>

4. Do you request use of the VGSI to mitigate the hazard associated with the unlit obstacle(s)? ***Note: The FAA does not guarantee approval of night IFP operations based on VGSI but will consider this request on a case-by-case basis.***	Yes ☐	No ☐	If "Yes", on which runway(s)? For the remaining questions, provide answers for each runway on which you are requesting VGSI mitigation. If "No", skip the rest of the checklist, sign and return.
5. Who owns the VGSI equipment? (e.g. Airport, FAA, etc.)			
6. Date VGSI equipment was commissioned?	Provide VGSI commissioning/Flight Inspection document		
7. Did FAA Flight Inspection commission the VGSI?	Yes ☐	No ☐	If "No", who commissioned the VGSI (e.g. FAA Engineering Support Group, 3rd Party provider, etc.).
8. What is the commissioned VGSI Glide Path Angle (GPA)?			
9. What is the commissioned VGSI Threshold Crossing Height (TCH)?			
10. Does the VGSI equipment currently meet obstruction clearance standards? FAA Order 6850.2, *Visual Guidance Lighting Systems*, and Advisory Circular (AC) 150/5340-30G, *Design and Installation Details for Airport Visual Aids*, describes standard VGSI installation. Contact FAA Operations Engineering Support Group (425-227-2345) or the company that installed the VGSI for further information.	Yes ☐	No ☐	If "No", describe the plan to bring the VGSI within standard.
11. Describe, in detail, your airport's VGSI maintenance program, to include, but not limited to, the following. (If additional space is needed, please attach a separate sheet document. Be sure to include your RWY and Airport ID at the top of the page. needed): - VGSI siting angle is verified accurate and meets standards, - VGSI obstacle-free approach plane is clear, - VGSI lighting is adequate, - VGSI surface inspection plan, - Date of last VGSI inspection, - Provide a copy of your VGSI inspection log, - If trees were trimmed to ensure OIS is clear, how often is/are the trees monitored for additional growth?, - If obstacles were marked/lighted, how			

often will the markings/lights be inspected? Advisory Circular (AC) 150/5340-26B, *Maintenance of Airport Visual Aid Facilities*, provides recommended guidelines for VGSI maintenance.	
12. Provide any additional information that will assist the FAA in making their approval determination.	

____

Printed Name and Title of Airport Authority

____ **Date: ___/___/____**

Signature

References:

- Code of Federal Regulations (CFR) Part 77, *Safe, Efficient Use, and Preservation of the Navigable Airspace*
- eCFR — Code of Federal Regulations
- FAA Order 8260.3, *United States Standard for Terminal Instrument Procedures (TERPS)* http://www.faa.gov/regulations_policies/orders_notices/index.cfm/go/document.information/documentid/11698
- FAA Order 6850.2, *Visual Guidance Lighting Systems* http://www.faa.gov/documentLibrary/media/Order/FINAL%20FAA%20Order%206850.2B.pdf
- Advisory Circular (AC) 150/5340-26B, *Maintenance of Airport Visual Aid Facilities* http://www.faa.gov/airports/resources/advisory_circulars/index.cfm/go/document.information/documentNumber/150_5340-26B
- Advisory Circular (AC) 150/5340-30G, *Design and Installation Details for Airport Visual Aids* http://www.faa.gov/documentLibrary/media/Advisory_Circular/150_5340_30g.pdf

Mead & Hunt

APPENDIX E:

IMPLEMENTATION GUIDE

ROSEBURG REGIONAL AIRPORT

APPENDIX E: IMPLEMENTATION GUIDE

Table H-1: Rehabilitate Runway Lighting Design & Construction

Project Title:	Rehabilitate Runway Lighting - Design & Construction	**Project Number:**	
Project Description:	Design and construct an upgrade for the aging airfield electrical system and Runway 16/34 lights; LED Supplemental windcone; LED Primary Windcone; Aiming point markings		
Total Cost (2017 Dollars):	$733,333	**Funding Sources:**	AIP $300,000 Disc. $360,000 Local $73,333
Year:	2019	**Phased Project**	☐ Yes ☒ No
Project Components	☐	Planning	
	☒	Design	
	☐	Environmental	
	☒	Construction	
Enabling Projects:			
Equipment Acquisition			
Comments:			
Is project timeline flexible? Are any projects dependent on this project?			

Planning and Zoning

Project Conformity	☒ Conforms to existing zoning ☐ May require rezone/Comprehensive Plan amendment
Project compliance with minimum standards	☒ Yes ☐ No
Any potential controversy based on stakeholder feedback?	.None
Process description and duration	

Environmental

Level of state and federal environmental review required?	Cat Ex
Potential complications?	None
Cost of mitigation	None
Description of mitigation process and uncertainty	None
Process description and duration	None

Design

Any pre-implementation support facility construction or site prep required?	☐ Yes ☒ No
Potential challenges of site location?	
Are there financial and operational risks based on project scale?	
Improvement suggestions of design process	

Process description and duration	

Funding

Can the Airport fund the project in its current state?	☒ Yes ☐ No
Fiscal impact of project on immediate and ongoing Airport finances.	
How competitive is the improvement for discretionary funding?	
How competitive is the project for FAA priority compared to other Airport CIP projects?	

Operation and Maintenance

Potential impact on airport operating costs?	Reduce electric utility expense
Are additional staff needed?	No

Table H-2: Pavement Management Program

Project Title:	Pavement Management Program (PMP)	**Project Number:**	
Project Description:	Maintain existing pavement		
Total Cost (2017 Dollars):	$22,222	**Funding Sources:**	AIP $20,000 Disc. $0 Local $2,222
Year:	2020, 2023, 2026, 2029, 2023, 2035, 2038	**Phased Project**	☒ Yes ☐ No
Project Components	☐	Planning	
	☐	Design	
	☐	Environmental	
	☐	Construction	
Enabling Projects:			
Equipment Acquisition			
Comments:			
Is project timeline flexible? Are any projects dependent on this project?			

Planning and Zoning

Project Conformity	☒ Conforms to existing zoning ☐ May require rezone/Comprehensive Plan amendment
Project compliance with minimum standards	☒ Yes ☐ No
Any potential controversy based on stakeholder feedback?	.None
Process description and duration	

Environmental

Level of state and federal environmental review required?	Environmental review, Cat Ex expected.
Potential complications?	None
Cost of mitigation	None
Description of mitigation process and uncertainty	None
Process description and duration	None

Design

Any pre-implementation support facility construction or site prep required?	☐ Yes ☒ No
Potential challenges of site location?	
Are there financial and operational risks based on project scale?	
Improvement suggestions of design process	

Process description and duration	

Funding

Can the Airport fund the project in its current state?	☒ Yes ☐ No
Fiscal impact of project on immediate and ongoing Airport finances.	
How competitive is the improvement for discretionary funding?	
How competitive is the project for FAA priority compared to other Airport CIP projects?	

Operation and Maintenance

Potential impact on airport operating costs?	
Are additional staff needed?	No

Table H-3: Environmental Assessment (ALP)

Project Title:	Environmental Assessment (ALP)	**Project Number:**	
Project Description:	The environmental assessment completed in September 2011 led to a Finding of No Significant Impact (FONSI) for the parallel taxiway relocation and runway extension project. Because of how much time has elapsed it is anticipated that a new environmental assessment is needed.		
Total Cost (2017 Dollars):	$311,111	**Funding Sources:**	AIP $280,000 Disc. $0 Local $31,111
Year:	2021, 2030	**Phased Project**	☐ Yes ☒ No
Project Components	☐	Planning	
	☐	Design	
	☒	Environmental	
	☐	Construction	
Enabling Projects:			
Equipment Acquisition			
Comments:	Environmental Assessment expected following Master Plan Updates to address ALP identified projects.		
Is project timeline flexible? Are any projects dependent on this project?			

Planning and Zoning

Project Conformity	☒ Conforms to existing zoning ☐ May require rezone/Comprehensive Plan amendment
Project compliance with minimum standards	☒ Yes ☐ No
Any potential controversy based on stakeholder feedback?	None
Process description and duration	

Environmental

Level of state and federal environmental review required?	None
Potential complications?	None
Cost of mitigation	None
Description of mitigation process and uncertainty	None
Process description and duration	None

Design

Any pre-implementation support facility construction or site prep required?	☐ Yes ☒ No
Potential challenges of site location?	
Are there financial and operational risks based on project scale?	
Improvement suggestions of design process	

Process description and duration	

Funding

Can the Airport fund the project in its current state?	☒ Yes ☐ No
Fiscal impact of project on immediate and ongoing Airport finances.	
How competitive is the improvement for discretionary funding?	
How competitive is the project for FAA priority compared to other Airport CIP projects?	

Operation and Maintenance

Potential impact on airport operating costs?	Reduce electric utility expense
Are additional staff needed?	No

Table H-4: Taxiway A Extension

Project Title:	Taxiway A Extension	**Project Number:**	
Project Description:	Funding constraints and prior eligibility issues prevented completion of the last 400 feet of Taxiway A to match the runway extension on Runway 16 when the taxiway was relocated. The extension of Taxiway A will provide a full parallel taxiway to Runway 16/34 and remove back-taxi operations.		
Total Cost (2017 Dollars):	$1,350,000	**Funding Sources:**	AIP $255,000 Disc. $960,000 Local $135,000
Year:	2023	**Phased Project**	☐ Yes ☒ No
Project Components	☐	Planning	
	☒	Design	
	☐	Environmental	
	☒	Construction	
Enabling Projects:	**2021 Environmental Assessment**		
Equipment Acquisition			
Comments:			
Is project timeline flexible? Are any projects dependent on this project?			

Planning and Zoning

Project Conformity	☒ Conforms to existing zoning ☐ May require rezone/Comprehensive Plan amendment
Project compliance with minimum standards	☒ Yes ☐ No
Any potential controversy based on stakeholder feedback?	None
Process description and duration	

Environmental

Level of state and federal environmental review required?	There is a potential for jurisdictional wetlands to be impacted by this project. A wetland delineation was completed for this area in 2010 and approved by DSL (WD# 2010-0229). Determination of the current presence or absence of jurisdictional wetlands may require an updated wetland delineation. May require review of SWPCP for overall increase in impervious surface and potential drainage pattern changes.
Potential complications?	The presence of jurisdictional wetlands may cause extended State and Federal review and may require a Joint Removal-Fill Permit to complete. May require revisions to SWPCP.
Cost of mitigation	Wetland mitigation is likely to cost $100,000/acre or more, whether done by permittee or as a purchase.
Description of mitigation process and uncertainty	Wetland mitigation is required for any unavoidable loss of wetland functions and values due to wetlands being filled. Wetland mitigation can be accomplished by either permittee responsible mitigation or payment to a mitigation bank or in-lieu fee program. Revisions to the SWPCP do not generally require mitigation but may result in changes to the stormwater sampling plan or reporting schedule.

Process description and duration	Permittee responsible mitigation requires a minimum of 5 years of monitoring and reporting to the regulatory agencies and could be extended. Permittee responsible mitigation is inherently more complicated and less certain than a mitigation payment, however no mitigation banks, or in-lieu fee programs are currently available in the Roseburg area. The mitigation method needs to be included as part of the Removal-Fill Permit application.

Design

Any pre-implementation support facility construction or site prep required?	☐ Yes ☒ No
Potential challenges of site location?	
Are there financial and operational risks based on project scale?	
Improvement suggestions of design process	
Process description and duration	

Funding

Can the Airport fund the project in its current state?	☒ Yes ☐ No
Fiscal impact of project on immediate and ongoing Airport finances.	
How competitive is the improvement for discretionary funding?	
How competitive is the project for FAA priority compared to other Airport CIP projects?	

Operation and Maintenance

Potential impact on airport operating costs?	Increase pavement area to be maintained.

Are additional staff needed?	No

Table H-5: PAPI Tree Maintenance Program

Project Title:	PAPI Tree Maintenance Program	**Project Number:**	
Project Description:	Ongoing management of potential tree obstacles for the Runway 34 Precision Approach Path Indicator (PAPI) slope.		
Total Cost (2017 Dollars):	$27,778	**Funding Sources:**	AIP $25,000 Disc. $0 Local $2,778
Year:	2024, 2029, 2034	**Phased Project**	☐ Yes ☒ No
Project Components	☐	Planning	
	☐	Design	
	☐	Environmental	
	☒	Construction	
Enabling Projects:			
Equipment Acquisition			
Comments:	Carried out every 5 years.		
Is project timeline flexible? Are any projects dependent on this project?			

Planning and Zoning

Project Conformity	☒ Conforms to existing zoning ☐ May require rezone/Comprehensive Plan amendment
Project compliance with minimum standards	☒ Yes ☐ No
Any potential controversy based on stakeholder feedback?	None
Process description and duration	

Environmental

Level of state and federal environmental review required?	The potential for jurisdictional wetlands to be impacted by the PAPI Tree Maintenance Program is limited. Vegetation, including tree removal, is not regulated under current state and federal wetland regulation. However, disturbance to the surface of the ground is. Therefore, if more than minimal ground disturbance is anticipated during tree maintenance activities, inspection by a qualified Wetland Professional will determine if Federal or State environmental review will be necessary. The PAPI Tree Maintenance Program is off of airport property and therefore would have no effect on the SWPCP.
Potential complications?	The presence of jurisdictional wetlands or waters of the State or United States may cause access issues. Any disturbance to wetlands or waters caused by access should be temporary but may still require a permit.
Cost of mitigation	Unknown
Description of mitigation process and uncertainty	Wetland mitigation for temporary impacts is generally limited to restoration to pre-impact conditions. Restoration activities are relatively inexpensive and uncomplicated.
Process description and duration	None

Design

Any pre-implementation support facility construction or site prep required?	☐ Yes ☒ No
Potential challenges of site location?	
Are there financial and operational risks based on project scale?	
Improvement suggestions of design process	
Process description and duration	

Funding

Can the Airport fund the project in its current state?	☒ Yes ☐ No
Fiscal impact of project on immediate and ongoing Airport finances.	
How competitive is the improvement for discretionary funding?	
How competitive is the project for FAA priority compared to other Airport CIP projects?	

Operation and Maintenance

Potential impact on airport operating costs?	
Are additional staff needed?	No

Table H-6: Aviation Reserve 1 Apron

Project Title:	Aviation Reserve 1 Apron	**Project Number:**	
Project Description:	The construction of the Aviation Reserve 1 apron will allow enough space to accommodate the Douglas Fire Protection Agency (DFPA) and the Single Engine Air Tanker (SEAT) Base during peak summer operations.		
Total Cost (2017 Dollars):	$5,129,000	**Funding Sources:**	AIP $150,000 Disc. $4,466,000 Local $519,900
Year:	2025	**Phased Project**	☐ Yes ☒ No
Project Components	☐	Planning	
	☒	Design	
	☐	Environmental	
	☒	Construction	
Enabling Projects:			
Equipment Acquisition			
Comments:	Wetland impacts from Aviation Reserve Aprons 1 & 2, and Aviation Reserve Hangers 1 & 2 could all be covered under one Removal-Fill Permit since the wetland being impacted was all delineated as part of one action. This would not require that they all be built at the same time. Construction could take place in phases over a specified number of years. It would require that a phased construction plan be included as part of the permit application, and that all of the mitigation necessary to replace the lost functions and values was included as one mitigation plan.		
Is project timeline flexible? Are any projects dependent on this project?			

Planning and Zoning

Project Conformity	☒ Conforms to existing zoning ☐ May require rezone/Comprehensive Plan amendment
Project compliance with minimum standards	☒ Yes ☐ No
Any potential controversy based on stakeholder feedback?	None
Process description and duration	

Environmental

Level of state and federal environmental review required?	Jurisdictional wetlands will be impacted by this project. A wetland delineation was done on this area of the airport property in May 2014 and concurred with in September 2014 (WD #2014-0304). A portion of the delineated wetland is located within the footprint of this project. The wetland delineation concurrence expires on 9/29/2019. The concurrence may be renewed for an additional 5 years under certain circumstances, if action is taken to do so prior to the concurrence expiring. This project may necessitate a review of the SWPCP for overall increase in impervious surface, and potential drainage pattern and drainage basin boundary changes.
Potential complications?	The presence of jurisdictional wetlands may cause extended State and Federal review and may require a Joint Removal-Fill Permit to complete. A small change to the impervious surface area in this drainage basin may result in minor revisions to the SWPCP.
Cost of mitigation	Wetland mitigation is likely to cost $100,000/acre or more, whether done by permittee or as a purchase.
Description of mitigation process and uncertainty	Wetland mitigation will be required for any unavoidable loss of wetland functions and values due to wetlands being filled. Wetland mitigation can be accomplished by either permittee responsible mitigation or payment to a mitigation bank or in-lieu fee program. Permittee responsible mitigation is inherently more complicated

	and less certain than a mitigation payment, however no mitigation banks, or in-lieu fee programs are currently available in the Roseburg area. The mitigation method needs to be included as part of the Removal-Fill Permit application. Revisions to the SWPCP do not generally require mitigation but may result in changes to the stormwater sampling plan or reporting schedule.
Process description and duration	Permittee responsible mitigation requires a minimum of 5 years of monitoring and reporting to the regulatory agencies and could be extended.

Design

Any pre-implementation support facility construction or site prep required?	☐ Yes ☒ No
Potential challenges of site location?	
Are there financial and operational risks based on project scale?	
Improvement suggestions of design process	
Process description and duration	

Funding

Can the Airport fund the project in its current state?	☒ Yes ☐ No
Fiscal impact of project on immediate and ongoing Airport finances.	
How competitive is the improvement for discretionary funding?	
How competitive is the project for FAA priority compared to other Airport CIP projects?	

Operation and Maintenance

Potential impact on airport operating costs?	Increase pavement area to be maintained.
Are additional staff needed?	No

Table H-7: Runway 34 Blast Pad

Project Title:	Runway 34 Blast Pad	**Project Number:**	
Project Description:	A blast pad will be constructed on the Runway 34 end to prevent the erosion effects of jet blast in the safety area.		
Total Cost (2017 Dollars):	$410,000	**Funding Sources:**	AIP $130,000 Disc. $239,000 Local $41,000
Year:	2025	**Phased Project**	☐ Yes ☒ No
Project Components	☐	Planning	
	☒	Design	
	☐	Environmental	
	☒	Construction	
Enabling Projects:			
Equipment Acquisition			
Comments:			
Is project timeline flexible? Are any projects dependent on this project?			

Planning and Zoning

Project Conformity	☒ Conforms to existing zoning ☐ May require rezone/Comprehensive Plan amendment
Project compliance with minimum standards	☒ Yes ☐ No
Any potential controversy based on stakeholder feedback?	None
Process description and duration	

Environmental

Level of state and federal environmental review required?	The potential for jurisdictional wetlands to be impacted by construction of the Runway 34 Blast Pad is limited. Inspection by a qualified Wetland Professional will determine if Federal or State environmental review will be necessary. May require a review of SWPCP for a change in impervious surface for this drainage basin.
Potential complications?	The presence of jurisdictional wetlands may cause extended State and Federal review, and may require a Joint Removal-Fill Permit to complete. A small change to the impervious surface area in this drainage basin will not result in revisions to the SWPCP.
Cost of mitigation	Wetland mitigation is likely to cost $100,000/acre or more, whether done by permittee or as a purchase.
Description of mitigation process and uncertainty	Wetland mitigation is not likely to be necessary as a result of this project. However, in the event that jurisdictional wetlands are impacted by construction of the blast pad, the impacts should be small, and the required mitigation would not be extensive. Wetland mitigation is required for any unavoidable loss of wetland functions and values due to wetlands being filled. Wetland mitigation can be accomplished by either permittee responsible mitigation or payment to a mitigation bank or in-lieu fee program.

	Revisions to the SWPCP do not generally require mitigation.
Process description and duration	Permittee responsible mitigation requires a minimum of 5 years of monitoring and reporting to the regulatory agencies and could be extended. Permittee responsible mitigation is inherently more complicated and less certain than a mitigation payment, however no mitigation banks, or in-lieu fee programs are currently available in the Roseburg area. The mitigation method needs to be included as part of the Removal-Fill Permit application.

Design

Any pre-implementation support facility construction or site prep required?	☐ Yes ☒ No
Potential challenges of site location?	
Are there financial and operational risks based on project scale?	
Improvement suggestions of design process	
Process description and duration	

Funding

Can the Airport fund the project in its current state?	☒ Yes ☐ No
Fiscal impact of project on immediate and ongoing Airport finances.	
How competitive is the improvement for discretionary funding?	
How competitive is the project for FAA priority compared to other Airport CIP projects?	

Operation and Maintenance

Potential impact on airport operating costs?	Increase pavement area to be maintained.

Are additional staff needed?	No

Table H-8: North/South Apron Vehicle Access Road

Project Title:	North/South Apron Vehicle Access Road	**Project Number:**	
Project Description:	Currently, tenants do not have vehicle access to the north and south aprons without exiting and reentering the Airport. The construction of an access road between the north and south aprons will allow users to travel between the two aprons more efficiently.		
Total Cost (2017 Dollars):	$365,000	**Funding Sources:**	AIP $60,000 Disc. $268,500 Local $36,500
Year:	2027	**Phased Project**	☐ Yes ☒ No
Project Components	☐	Planning	
	☒	Design	
	☐	Environmental	
	☒	Construction	
Enabling Projects:	**Environmental Assessment (ALP)**		
Equipment Acquisition			
Comments:	Mitigation for impacts to waters of the State or the United States and aquatic habitat mitigation can often be effectively combined with mitigation for unavoidable wetland impacts, all under one permit application. Consideration should be given to the possibility of combining all projects requiring a removal-fill permit and mitigation into one permit application.		
Is project timeline flexible? Are any projects dependent on this project?			

Planning and Zoning

Project Conformity	☒ Conforms to existing zoning ☐ May require rezone/Comprehensive Plan amendment
Project compliance with minimum standards	☒ Yes ☐ No
Any potential controversy based on stakeholder feedback?	None
Process description and duration	

Environmental

Level of state and federal environmental review required?	There is a potential for jurisdictional wetlands and waters of the State and the United States to be impacted by this project. Determination of the presence or absence of jurisdictional wetlands or waters of the State or of the United States may require a wetland delineation. There is potential for the fish passage structure in Newton Creek to be impacted by this project, which will be reviewed by State and Federal fisheries agencies. This project will require review of SWPCP for overall increase in impervious surface, and potential drainage pattern and storm water component changes.
Potential complications?	The presence of jurisdictional wetlands or waters may cause extended State and Federal review, and may require a Joint Removal-Fill Permit to complete. The presence of the fish passage structure may complicate the design, review and construction of the access road. Many state and federal agencies were involved in the approval and construction of the fish passage structure that will review the design and construction of this project. Impacts to endangered anadromous fish species may require federal consultation. May require revisions to SWPCP.

Cost of mitigation	Wetland mitigation is likely to cost $100,000/acre or more, whether done by permittee or as a purchase.
Description of mitigation process and uncertainty	Wetland mitigation is required for any unavoidable loss of wetland functions and values due to wetlands being filled. Wetland mitigation can be accomplished by either permittee responsible mitigation or payment to a mitigation bank or in-lieu fee program
Process description and duration	Permittee responsible mitigation requires a minimum of 5 years of monitoring and reporting to the regulatory agencies and could be extended. Permittee responsible mitigation is inherently more complicated and less certain than a mitigation payment, however no mitigation banks, or in-lieu fee programs are currently available in the Roseburg area. The mitigation method needs to be included as part of the Removal-Fill Permit application. Mitigation of impacts to waters of the State and the United States are conducted similarly to wetland mitigation, with similar expense and complications. Mitigation to waters and wetlands are often parts of the same mitigation plan. Options for mitigation payment to a bank, or in-lieu fee program, for impacts to waters are even more limited than for wetlands. Impacts or changes to the fish passage structure may require aquatic habitat mitigation. The process for aquatic habitat mitigation is not as well defined as wetland mitigation and will require additional input from state and federal fisheries agencies. Revisions to the SWPCP do not generally require mitigation but may result in changes to the stormwater sampling plan or reporting schedule.

Design

Any pre-implementation support facility construction or site prep required?	☐ Yes ☒ No
Potential challenges of site location?	
Are there financial and operational risks based on project scale?	
Improvement suggestions of design process	

Process description and duration	

Funding

Can the Airport fund the project in its current state?	☒ Yes ☐ No
Fiscal impact of project on immediate and ongoing Airport finances.	
How competitive is the improvement for discretionary funding?	
How competitive is the project for FAA priority compared to other Airport CIP projects?	

Operation and Maintenance

Potential impact on airport operating costs?	Increase pavement area to be maintained.
Are additional staff needed?	No

Table H-9: Master Plan Update

Project Title:	Master Plan Update	**Project Number:**	
Project Description:	Ongoing management of potential tree obstacles for the Runway 34 Precision Approach Path Indicator (PAPI) slope.		
Total Cost (2017 Dollars):	$692,000	**Funding Sources:**	AIP $150,000 Disc. $472,800 Local $69,200
Year:	2029	**Phased Project**	☐ Yes ☒ No
Project Components	☒	Planning	
	☐	Design	
	☐	Environmental	
	☐	Construction	
Enabling Projects:			
Equipment Acquisition			
Comments:			
Is project timeline flexible? Are any projects dependent on this project?			

Planning and Zoning

Project Conformity	☒ Conforms to existing zoning ☐ May require rezone/Comprehensive Plan amendment
Project compliance with minimum standards	☒ Yes ☐ No
Any potential controversy based on stakeholder feedback?	None
Process description and duration	

Environmental

Level of state and federal environmental review required?	Environmental review required for Inventory chapter and preferred alternatives.
Potential complications?	None
Cost of mitigation	None
Description of mitigation process and uncertainty	None
Process description and duration	None

Design

Any pre-implementation support facility construction or site prep required?	☐ Yes ☒ No
Potential challenges of site location?	
Are there financial and operational risks based on project scale?	
Improvement suggestions of design process	

Process description and duration	

Funding

Can the Airport fund the project in its current state?	☒ Yes ☐ No
Fiscal impact of project on immediate and ongoing Airport finances.	
How competitive is the improvement for discretionary funding?	
How competitive is the project for FAA priority compared to other Airport CIP projects?	

Operation and Maintenance

Potential impact on airport operating costs?	None
Are additional staff needed?	No

Table H-10: Aviation Reserve 3 Apron

Project Title:	Aviation Reserve 3 Apron	**Project Number:**	
Project Description:	The Airport forecasts indicate a future need for more helicopter parking space. The construction of Aviation Reserve Apron 3 will provide a dedicated space on the airfield for helicopter operations.		
Total Cost (2017 Dollars):	$4,611,000	**Funding Sources:**	AIP $255,000 Disc. $3,894,900 Local $461,100
Year:	2031	**Phased Project**	☒ Yes ☐ No
Project Components	☐	Planning	
	☒	Design	
	☐	Environmental	
	☒	Construction	
Enabling Projects:			
Equipment Acquisition			
Comments:			
Is project timeline flexible? Are any projects dependent on this project?			

Planning and Zoning

Project Conformity	☒ Conforms to existing zoning ☐ May require rezone/Comprehensive Plan amendment
Project compliance with minimum standards	☒ Yes ☐ No
Any potential controversy based on stakeholder feedback?	None
Process description and duration	

Environmental

Level of state and federal environmental review required?	There is a potential for jurisdictional wetlands to be impacted by this project. A wetland delineation was completed for this area in 2010 and approved by DSL (WD# 2010-0229). Determination of the current presence or absence of jurisdictional wetlands may require an updated wetland delineation. May require review of SWPCP for overall increase in impervious surface, and potential drainage pattern changes.
Potential complications?	The presence of jurisdictional wetlands may cause extended State and Federal review and may require a Joint Removal-Fill Permit to complete. May require revisions to SWPCP.
Cost of mitigation	Wetland mitigation is likely to cost $100,000/acre or more, whether done by permittee or as a purchase.
Description of mitigation process and uncertainty	Wetland mitigation is required for any unavoidable loss of wetland functions and values due to wetlands being filled. Wetland mitigation can be accomplished by either permittee responsible mitigation or payment to a mitigation bank or in-lieu fee program. Permittee responsible mitigation is inherently more complicated and less certain than a mitigation payment, however no mitigation banks or in-lieu fee programs are currently available in the Roseburg area. The mitigation method needs to be included as part of the Removal-Fill Permit application.

	Revisions to the SWPCP do not generally require mitigation but may result in changes to the stormwater sampling plan or reporting schedule.
Process description and duration	Permittee responsible mitigation requires a minimum of 5 years of monitoring and reporting to the regulatory agencies, and could be extended.

Design

Any pre-implementation support facility construction or site prep required?	☐ Yes ☒ No
Potential challenges of site location?	
Are there financial and operational risks based on project scale?	
Improvement suggestions of design process	
Process description and duration	

Funding

Can the Airport fund the project in its current state?	☒ Yes ☐ No
Fiscal impact of project on immediate and ongoing Airport finances.	
How competitive is the improvement for discretionary funding?	
How competitive is the project for FAA priority compared to other Airport CIP projects?	

Operation and Maintenance

Potential impact on airport operating costs?	Increase pavement area to be maintained.
Are additional staff needed?	No

Table H-11: South Apron Rehabilitation

Project Title:	South Apron Rehabilitation	**Project Number:**	
Project Description:	Maintain existing pavement		
Total Cost (2017 Dollars):	$3,818,000	**Funding Sources:**	AIP $150,000 Disc. $3,286,200 Local $381,800
Year:	2031	**Phased Project**	☐ Yes ☒ No
Project Components	☐	Planning	
	☒	Design	
	☐	Environmental	
	☒	Construction	
Enabling Projects:			
Equipment Acquisition			
Comments:			
Is project timeline flexible? Are any projects dependent on this project?			

Planning and Zoning

Project Conformity	☒ Conforms to existing zoning ☐ May require rezone/Comprehensive Plan amendment
Project compliance with minimum standards	☒ Yes ☐ No
Any potential controversy based on stakeholder feedback?	None
Process description and duration	

Environmental

Level of state and federal environmental review required?	Environmental review with Cat Ex expected
Potential complications?	None
Cost of mitigation	None
Description of mitigation process and uncertainty	None
Process description and duration	None

Design

Any pre-implementation support facility construction or site prep required?	☐ Yes ☒ No
Potential challenges of site location?	
Are there financial and operational risks based on project scale?	
Improvement suggestions of design process	

Process description and duration	

Funding

Can the Airport fund the project in its current state?	☒ Yes ☐ No
Fiscal impact of project on immediate and ongoing Airport finances.	
How competitive is the improvement for discretionary funding?	
How competitive is the project for FAA priority compared to other Airport CIP projects?	

Operation and Maintenance

Potential impact on airport operating costs?	Increase pavement area to be maintained.
Are additional staff needed?	No

Table H-12: Relocation of Taxiway Connectors

<table>
<tr><td>Project Title:</td><td>Relocation of Taxiway Connectors</td><td colspan="2">Project Number:</td><td></td></tr>
<tr><td>Project Description:</td><td colspan="4">The existing Taxiway A3, A4, and A5 connectors allow for aircraft to have direct access from the aprons on the airfield to Runway 16/34. In addition to this safety hazard, by 2031, the pavements for Taxiways A3, A4, and A5 will need significant rehabilitation. Relocation of the taxiway connectors will remove the direct access hazard.</td></tr>
<tr><td>Total Cost (2017 Dollars):</td><td>$5,273,000</td><td colspan="2">Funding Sources:</td><td>AIP $280,000
Disc. $4,465,700
Local $527,300</td></tr>
<tr><td>Year:</td><td>2035</td><td colspan="2">Phased Project</td><td>☐ Yes
☒ No</td></tr>
<tr><td rowspan="4">Project Components</td><td>☐</td><td>Planning</td><td colspan="2"></td></tr>
<tr><td>☒</td><td>Design</td><td colspan="2"></td></tr>
<tr><td>☐</td><td>Environmental</td><td colspan="2"></td></tr>
<tr><td>☒</td><td>Construction</td><td colspan="2"></td></tr>
<tr><td>Enabling Projects:</td><td colspan="4">Environmental Assessment in 2030.</td></tr>
<tr><td>Equipment Acquisition</td><td colspan="4"></td></tr>
<tr><td>Comments:</td><td colspan="4"></td></tr>
<tr><td>Is project timeline flexible? Are any projects dependent on this project?</td><td colspan="4"></td></tr>
</table>

Planning and Zoning

Project Conformity	☒ Conforms to existing zoning ☐ May require rezone/Comprehensive Plan amendment
Project compliance with minimum standards	☒ Yes ☐ No
Any potential controversy based on stakeholder feedback?	None
Process description and duration	

Environmental

Level of state and federal environmental review required?	The potential for jurisdictional wetlands to be impacted by relocating the connectors is limited. Inspection by a qualified Wetland Professional will determine if Federal or State environmental review will be necessary. May require a review of SWPCP for a change in impervious surface for these drainage basins.
Potential complications?	The presence of jurisdictional wetlands may cause extended State and Federal review and may require a Joint Removal-Fill Permit to complete. A small change to the impervious surface area in these drainage basins will not result in revisions to the SWPCP.
Cost of mitigation	Wetland mitigation is likely to cost $100,000/acre or more, whether done by permittee or as a purchase.
Description of mitigation process and uncertainty	Wetland mitigation is required for any unavoidable loss of wetland functions and values due to wetlands being filled. Wetland mitigation can be accomplished by either permittee responsible mitigation or payment to a mitigation bank or in-lieu fee program.
Process description and duration	Permittee responsible mitigation requires a minimum of 5 years of monitoring and reporting to the regulatory agencies, and could be extended. Permittee responsible mitigation is inherently more complicated and less certain than a mitigation payment, however no mitigation banks, or in-lieu fee programs are currently available in the Roseburg area. The mitigation method

	needs to be included as part of the Removal-Fill Permit application. Revisions to the SWPCP do not generally require mitigation.

Design

Any pre-implementation support facility construction or site prep required?	☐ Yes ☒ No
Potential challenges of site location?	
Are there financial and operational risks based on project scale?	
Improvement suggestions of design process	
Process description and duration	

Funding

Can the Airport fund the project in its current state?	☒ Yes ☐ No
Fiscal impact of project on immediate and ongoing Airport finances.	
How competitive is the improvement for discretionary funding?	
How competitive is the project for FAA priority compared to other Airport CIP projects?	

Operation and Maintenance

Potential impact on airport operating costs?	Increase pavement area to be maintained.
Are additional staff needed?	No

Table H-13: Aviation Reserve 2 Apron

Project Title:	Aviation Reserve 2 Apron	**Project Number:**	
Project Description:	The Airport forecasts indicate a future need for more apron and hangar space. The construction of Aviation Reserve Apron 2 will provide sufficient space on the airfield to help meet the forecasted demand.		
Total Cost (2017 Dollars):	$4,892,000	**Funding Sources:**	AIP $255,000 Disc. $4,147,800 Local $482,200
Year:	2033	**Phased Project**	☐ Yes ☒ No
Project Components	☐	Planning	
	☒	Design	
	☐	Environmental	
	☒	Construction	
Enabling Projects:	**Environmental Assessment in 2030.**		
Equipment Acquisition			
Comments:	Wetland impacts from Aviation Reserve Aprons 1 & 2, and Aviation Reserve Hangers 1 & 2 could all be covered under one Removal-Fill Permit since the wetland being impacted was all delineated as part of one action. This would not require that they all be built at the same time. Construction could take place in phases over a specified number of years. It would require that a phased construction plan be included as part of the permit application, and that all of the mitigation necessary to replace the lost functions and values was included as one mitigation plan.		
Is project timeline flexible? Are any projects dependent on this project?			

Planning and Zoning

Project Conformity	☒ Conforms to existing zoning ☐ May require rezone/Comprehensive Plan amendment
Project compliance with minimum standards	☒ Yes ☐ No
Any potential controversy based on stakeholder feedback?	None
Process description and duration	

Environmental

Level of state and federal environmental review required?	Jurisdictional wetlands will be impacted by this project. A wetland delineation was done on this area of the airport property in May 2014 and concurred with in September 2014 (WD #2014-0304). A portion of the delineated wetland is located within the footprint of this project. The wetland delineation concurrence expires on 9/29/2019. The concurrence may be renewed for an additional 5 years under certain circumstances, if action is taken to do so prior to the concurrence expiring. This project may necessitate a review of the SWPCP for overall increase in impervious surface, and potential drainage pattern and drainage basin boundary changes.
Potential complications?	The presence of jurisdictional wetlands may cause extended State and Federal review and may require a Joint Removal-Fill Permit to complete. A small change to the impervious surface area in these drainage basins will not result in revisions to the SWPCP.
Cost of mitigation	Wetland mitigation is likely to cost $100,000/acre or more, whether done by permittee or as a purchase.
Description of mitigation process and uncertainty	Wetland mitigation is required for any unavoidable loss of wetland functions and values due to wetlands being filled. Wetland mitigation can be accomplished by either permittee responsible mitigation or payment to a mitigation bank or in-lieu fee program.

Process description and duration	Permittee responsible mitigation requires a minimum of 5 years of monitoring and reporting to the regulatory agencies and could be extended. Permittee responsible mitigation is inherently more complicated and less certain than a mitigation payment, however no mitigation banks, or in-lieu fee programs are currently available in the Roseburg area. The mitigation method needs to be included as part of the Removal-Fill Permit application. Revisions to the SWPCP do not generally require mitigation.

Design

Any pre-implementation support facility construction or site prep required?	☐ Yes ☒ No
Potential challenges of site location?	
Are there financial and operational risks based on project scale?	
Improvement suggestions of design process	
Process description and duration	

Funding

Can the Airport fund the project in its current state?	☒ Yes ☐ No
Fiscal impact of project on immediate and ongoing Airport finances.	
How competitive is the improvement for discretionary funding?	
How competitive is the project for FAA priority compared to other Airport CIP projects?	

Operation and Maintenance

Potential impact on airport operating costs?	Increase pavement area to be maintained.
Are additional staff needed?	No

Table H-15: Runway 16/34 Rehabilitation

Project Title:	Runway 16/34 Rehabilitation	**Project Number:**	
Project Description:	Based on the Pavement Evaluation/Maintenance Management Program performed by ODA, it is expected Runway 16/34 at the Airport will need to be rehabilitated.		
Total Cost (2017 Dollars):	$2,894,000	**Funding Sources:**	AIP $150,000 Disc. $2,454,600 Local $289,400
Year:	2036	**Phased Project**	☒ Yes ☐ No
Project Components	☐	Planning	
	☒	Design	
	☐	Environmental	
	☒	Construction	
Enabling Projects:	**Environmental Assessment in 2030.**		
Equipment Acquisition			
Comments:			
Is project timeline flexible? Are any projects dependent on this project?			

Planning and Zoning

Project Conformity	☒ Conforms to existing zoning ☐ May require rezone/Comprehensive Plan amendment
Project compliance with minimum standards	☒ Yes ☐ No
Any potential controversy based on stakeholder feedback?	None
Process description and duration	

Environmental

Level of state and federal environmental review required?	Environmental review, but Cat ex is expected.
Potential complications?	
Cost of mitigation	
Description of mitigation process and uncertainty	
Process description and duration	

Design

Any pre-implementation support facility construction or site prep required?	☐ Yes ☒ No
Potential challenges of site location?	
Are there financial and operational risks based on project scale?	
Improvement suggestions of design process	

Process description and duration	

Funding

Can the Airport fund the project in its current state?	☒ Yes ☐ No
Fiscal impact of project on immediate and ongoing Airport finances.	
How competitive is the improvement for discretionary funding?	
How competitive is the project for FAA priority compared to other Airport CIP projects?	

Operation and Maintenance

Potential impact on airport operating costs?	Reduced need for pavement maintenance on runway surfaces.
Are additional staff needed?	No

Table H-16: North Apron Expansion

Project Title:	Aviation Reserve 2 Apron	**Project Number:**	
Project Description:	The Airport forecasts indicate a future need for more apron space. The construction of the North Apron Expansion will provide sufficient space on the airfield to help meet the forecasted demand.		
Total Cost (2017 Dollars):	$2,069,000	**Funding Sources:**	AIP $150,000 Disc. $1,712,100 Local $206,900
Year:	2037	**Phased Project**	☐ Yes ☒ No
Project Components	☐	Planning	
	☒	Design	
	☐	Environmental	
	☒	Construction	
Enabling Projects:	**Environmental Assessment in 2030.**		
Equipment Acquisition			
Comments:			
Is project timeline flexible? Are any projects dependent on this project?			

Planning and Zoning

Project Conformity	☒ Conforms to existing zoning ☐ May require rezone/Comprehensive Plan amendment
Project compliance with minimum standards	☒ Yes ☐ No
Any potential controversy based on stakeholder feedback?	None
Process description and duration	

Environmental

Level of state and federal environmental review required?	The potential for jurisdictional wetlands to be impacted by expanding the paved area in the southeast corner of the North Apron and adding T-Hangers is minimal. Inspection by a qualified Wetland Professional will determine if Federal or State environmental review will be necessary. May require a review of SWPCP for a change in impervious surface for this drainage basin.
Potential complications?	The presence of jurisdictional wetlands may cause extended State and Federal review and may require a Joint Removal-Fill Permit to complete. A small change to the impervious surface area in these drainage basins will not result in revisions to the SWPCP.
Cost of mitigation	Wetland mitigation is likely to cost $100,000/acre or more, whether done by permittee or as a purchase.
Description of mitigation process and uncertainty	Wetland mitigation is not likely to be necessary as a result of this project. Revisions to the SWPCP do not generally require mitigation.
Process description and duration	available in the Roseburg area. The mitigation method needs to be included as part of the Removal-Fill Permit application. Revisions to the SWPCP do not generally require mitigation.

Design

Any pre-implementation support facility construction or site prep required?	☐ Yes ☒ No
Potential challenges of site location?	
Are there financial and operational risks based on project scale?	
Improvement suggestions of design process	
Process description and duration	

Funding

Can the Airport fund the project in its current state?	☒ Yes ☐ No
Fiscal impact of project on immediate and ongoing Airport finances.	
How competitive is the improvement for discretionary funding?	
How competitive is the project for FAA priority compared to other Airport CIP projects?	

Operation and Maintenance

Potential impact on airport operating costs?	Increase pavement area to be maintained.
Are additional staff needed?	No

Table H-17: Realign NW Stewart Parkway

Project Title:	Realign NW Stewart Parkway	**Project Number:**	
Project Description:	In 2038, realigning NW Stewart Parkway will allow Runway 16/34 to meet FAA design standards.		
Total Cost (2017 Dollars):	$5,733,000	**Funding Sources:**	AIP $130,000 Disc. $5,029,700 Local $573,000
Year:	2038	**Phased Project**	☐ Yes ☒ No
Project Components	☐	Planning	
	☒	Design	
	☐	Environmental	
	☒	Construction	
Enabling Projects:	**Environmental Assessment in 2030.**		
Equipment Acquisition			
Comments:			
Is project timeline flexible? Are any projects dependent on this project?			

Planning and Zoning

Project Conformity	☒ Conforms to existing zoning ☐ May require rezone/Comprehensive Plan amendment
Project compliance with minimum standards	☒ Yes ☐ No
Any potential controversy based on stakeholder feedback?	None
Process description and duration	

Environmental

Level of state and federal environmental review required?	The non-standard ROFA section at the south end of the airport property does not include any jurisdictional wetlands that would require State or Federal environmental review. There would be no effect to the SWPCP
Potential complications?	No complications resulting from impacts to wetlands or waters of the State or United States are anticipated.
Cost of mitigation	None
Description of mitigation process and uncertainty	No mitigation will be necessary.
Process description and duration	

Design

Any pre-implementation support facility construction or site prep required?	☐ Yes ☒ No
Potential challenges of site location?	
Are there financial and operational risks based on project scale?	

Improvement suggestions of design process	
Process description and duration	

Funding

Can the Airport fund the project in its current state?	☒ Yes ☐ No
Fiscal impact of project on immediate and ongoing Airport finances.	
How competitive is the improvement for discretionary funding?	
How competitive is the project for FAA priority compared to other Airport CIP projects?	

Operation and Maintenance

Potential impact on airport operating costs?	Increase pavement area to be maintained.
Are additional staff needed?	No

APPENDIX F:

RUNWAY LENGTH ANALYSIS

ROSEBURG REGIONAL AIRPORT
APPENDIX F: RUNWAY LENGTH STUDY

F.1 STUDY OVERVIEW

The purpose of this study is to determine the near-term (5-year) appropriate runway length for the Roseburg Regional Airport (RBG or the Airport). RBG has a single 5,003-foot runway (Runway 16/34). Prior to 2012, Runway 16/34 was 4,602 feet in length. The 2006 RBG Airport Layout Plan (ALP) highlighted a future 400-foot runway extension. In 2012, the 400-foot runway extension was completed in accordance with the future runway length denoted on the ALP. This appendix utilizes the procedures in FAA Advisory Circular (AC) 150/5325-4B, *Runway Length Requirements for Airport Design* (AC 150/5325-4B) to determine the recommended runway length for the Airport.

Definitions

Critical Design Airplanes
The listing of airplanes (or a single airplane) that results in the longest recommended runway length. The listed airplanes will be evaluated either individually or as a single family grouping to obtain a recommended runway length.

Small Airplane
An airplane of 12,500 pounds or less maximum certificated takeoff weight.

Large Airplane
An airplane of more than 12,500 pounds maximum certificated takeoff weight.

Maximum Certificated Takeoff Weight
The maximum certificated weight (MTOW) for the airplane at takeoff, i.e., the airplane's weight at the start of the takeoff run.

Regional Jet
Commercial jet airplane that carries fewer than 100 passengers.

Regular Use Threshold
Federally funded projects require that critical design airplanes have at least 500 or more annual itinerant operations at the airport (landings and takeoffs are considered as separate operations) for an individual airplane or a family grouping of airplanes.

Itinerant Operation
Takeoff or landing operations of airplanes going from one airport to another airport that involves a trip of at least 20 miles.

Effective Runway Gradient.
The difference between the highest and lowest elevations of the runway centerline divided by the runway length.

Useful Load Factor
The difference between the maximum allowable structural gross weight and the operating empty weight (passengers, cargo, and usable fuel) of an aircraft.

Source: FAA Advisory Circular (AC) 150/5325-4B, *Runway Length Requirements for Airport Design*

F.2 INTRODUCTION TO RUNWAY LENGTH

This study identifies a future planned length necessary to meet the Airport's forecast jet aircraft demand. The analysis identifies a single length in consideration of aircraft design characteristics and annual activity levels. For planning purposes, the future runway length should be suitable to meet the takeoff and landing performance distances of the critical design aircraft, or the regular use threshold for a grouping of the aircraft fleet with similar characteristics. At RBG, the large business jets are the most demanding type of aircraft in terms of runway length requirements.

F.3 AC 150/5325-4B RUNWAY LENGTH ANALYSIS

This study utilizes the five-step procedure for determining the recommended runway lengths at airports as described in AC 150/5325-4B. The five steps are as follows:

- **Step 1 –** Identify the list of critical design airplanes.
- **Step 2 –** Identify the airplanes that will require the longest runway lengths at maximum certificated takeoff weight.
- **Step 3 –** Determine the method that will be used for establishing the recommended runway length.
- **Step 4 –** Select the recommended runway length.
- **Step 5 –** Apply any necessary adjustment to the obtain runway length.

F.3.1 (AC 150/5325-4B STEP 1) – IDENTIFY THE LIST OF CRITICAL DESIGN AIRPLANES

The first step in determining the recommended runway length is to identify the list of critical design airplanes or a family grouping of airplanes that will make regular use of the runway for an established planning period of at least five years. As determined in **Chapter 2, Aviation Activity Forecasts**, the critical design grouping of airplanes are B-II aircraft. Additionally, as outlined in Section 2.6 Critical Aircraft of **Chapter 2, Aviation Activity Forecasts**, there is limited aircraft operation data available for RBG due to the lack of an airport traffic control tower and limitations in the FAA Traffic Flow Management System Counts (TFMSC) and FlightAware. Listed below in **Table F-1** are B-II aircraft from the sample TFMSC and FlightAware data that have operated at least 10 times at the Airport within the last three years. Aircraft that have operated only in single years, or have appeared to stop operating at the Airport, have been removed.

Table F-1: Critical Design Airplanes

B-II Aircraft	Sample Operations - Year			Total Sample Operations
	2016	2015	2014	
Cessna Excel/XLS	206	202	214	622
Cessna Citation II/Bravo	52	34	90	176
Beech King Air 90	56	50	54	160
Beechcraft 200 Super King	74	32	36	142
Cessna Citation II/SP	28	22	20	70
Dassault Falcon/Mystère 50	18	30	0	48
Embraer Phenom 300	6	20	8	34
Raytheon 300 Super King Air	18	6	2	26
Cessna Citation V/Ultra/Encore	6	6	14	26
Cessna Citation CJ4	12	4	4	20
Removed Aircraft				
~~Gulfstream Commander~~	~~0~~	~~8~~	~~124~~	~~132~~
~~FA20 - Dassault Falcon/Mystère 20~~	~~0~~	~~18~~	~~4~~	~~22~~
~~B350 - Beechcraft Super King Air 350~~	~~0~~	~~6~~	~~6~~	~~12~~
~~Cessna Citation Sovereign~~	~~2~~	~~8~~	~~2~~	~~12~~
~~Dassault Falcon 2000~~	~~4~~	~~0~~	~~2~~	~~6~~
~~Rockwell Aero Commander 500~~	~~0~~	~~4~~	~~0~~	~~4~~
~~Cessna III/VI/VII~~	~~0~~	~~0~~	~~4~~	~~4~~
~~Fairchild Swearingen SA-226T~~	~~0~~	~~0~~	~~4~~	~~4~~
~~Beechcraft 1900/C-12J~~	~~2~~	~~0~~	~~0~~	~~2~~
~~Cessna Citation CJ3~~	~~2~~	~~0~~	~~0~~	~~2~~
~~Fairchild Dornier 328 Jet~~	~~0~~	~~0~~	~~2~~	~~2~~

Source: TFMSC, FlightAware

F.3.2 (AC 150/5325-4B) STEP 2 – IDENTIFY THE AIRPLANES THAT WILL REQUIRE THE LONGEST RUNWAY LENGTHS AT MAXIMUM CERTIFICATED TAKEOFF WEIGHT (MTOW)

The second step in determining the recommended runway length is identifying the airplanes that will require the longest runway lengths at maximum certificated takeoff weight (MTOW). When the MTOW of listed airplanes is 60,000 pounds (27,200 kg) or less, the recommended runway length is determined according to a family grouping of airplanes having similar performance characteristics and operating weights. The aircraft listed in **Table F-1** will be used as the list of critical design airplanes for this step. The MTOW for aircraft selected from **Table F-1** are listed below in **Table F-2**.

Table F-2: Critical Aircraft

B-II Aircraft	MTOW	Percent of the Fleet
Cessna Excel/XLS	20,200	75
Cessna Citation II/Bravo	14,800	75
Beech King Air 90	10,950	-
Beechcraft 200 Super King	12,500	-
Cessna Citation II/SP	14,800	75
Dassault Falcon/Mystère 50	39,700	75
Embraer Phenom 300	17,968	-
Raytheon 300 Super King Air	15,000	-
Cessna Citation V/Ultra/Encore	16,630	75
Cessna Citation CJ4	17,110	75
Average MTOW	**17,965**	

Source: FAA Aircraft Characteristics Database (January 2018)

F.3.3 (AC 150/5325-4B STEP 3) – DETERMINE THE METHOD THAT WILL BE USED FOR ESTABLISHING THE RECOMMENDED RUNWAY LENGTH.

For the third step in determining the recommended runway length, AC 150/5325-4B states to use "Table 1-1" and the airplanes identified in **Step 2** to determine the method that will be used for establishing the recommended runway length. "Table 1-1" of AC 150/5325-4B categorizes potential design airplanes according to their MTOW. "Table 1-1" is reproduced below in **Table F-3.**

Table F-3: AC 150/5325-4B Table 1-1.
Airplane Weight Categorization for Runway Length Requirements

Airplane Weight Category (MTOW)			Design Approach	Location of Design Guidelines
12,500 pounds or less	Approach speed less than 30 knots		Family grouping of small airplanes	Chapter 2; Paragraph 203
	Approach speeds of at least 30 knots but less than 50 knots		Family grouping of small airplanes	Chapter 2; Paragraph 204
	Approach speeds of 50 knots or more	With Less than 10 Passengers	Family grouping of small airplanes	Chapter 2; Paragraph 205 Figure 2-1
		With 10 or more Passengers	Family grouping of small airplanes	Chapter 2; Paragraph 205 Figure 2-2
Over 12,500 pounds but less than 60,000 pounds			**Family grouping of large airplanes**	**Chapter 3; Figures 3-1 or 3-2[1] and Tables 3-1 or 3-2**
60,000 pounds or more or Regional Jets[2]			Individual large airplane	Chapter 4; Airplane Manufacturer Websites (Appendix 1)

1: When the design airplane's Airport Planning Manual (APM) shows a longer runway length than what is shown in figure 3-2, use the airplane manufacturer's APM. However, users of an APM are to adhere to the design guidelines found in Chapter 4.

2: All regional jets regardless of their MTOW are assigned to the 60,000 pounds (27,200 kg) or more weight category.

Source: FAA Advisory Circular (AC) 150/5325-4B, *Runway Length Requirements for Airport Design*

Based on the list of critical airplanes found in **Step 2**, the majority of B-II aircraft that operate at the Airport have MTOWs well over 12,500 lbs. Additionally the Cessna Excel/XLS, the critical aircraft highlighted in **Chapter 2, Aviation Activity Forecasts**, has an MTOW of 20,200 lbs. For this reason, Chapter 3 of AC 150/5325-4B will be used for establishing the recommended runway length based on "Table 1-1" of AC 150/5325-4B as shown above in **Table F-3**.

F.3.4 (AC 150/5325-4B STEP 4) – SELECT THE RECOMMENDED RUNWAY LENGTH.

For the fourth step in determining the recommended runway length, the design procedure outlined in Chapter 3 of AC 150/5325-4B requires the airport elevation above mean sea level (533.5 ft), mean daily maximum temperature of the hottest month at the airport (83º F), and the critical design airplanes under evaluation with their respective useful loads.

The recommended runway length for airplanes between MTOWs of 12,500 lbs and 60,000 lbs is based on performance curves (**Figures F-1 and F-2**) developed from FAA-approved airplane flight manuals in accordance with the provisions of 14 Code of Federal Regulations Part 25, Airworthiness Standards: Transport Category Airplanes, and Part 91, General Operating and Flight Rules.

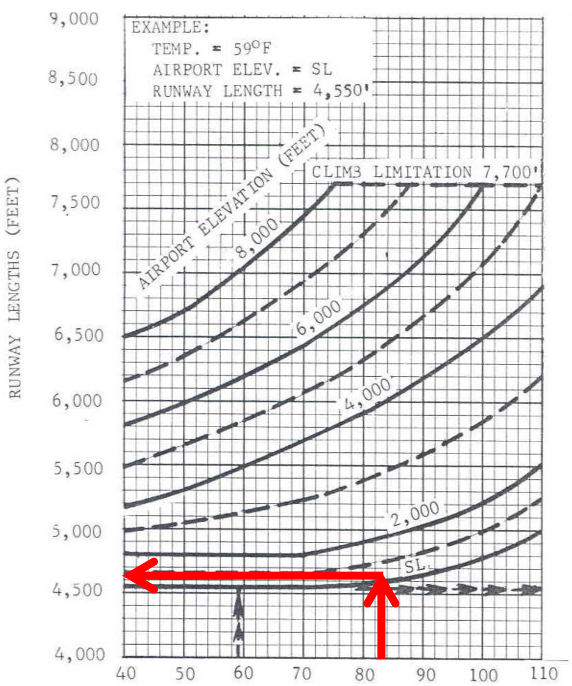


Figure F-1: **75% of fleet at 60% Useful Load**

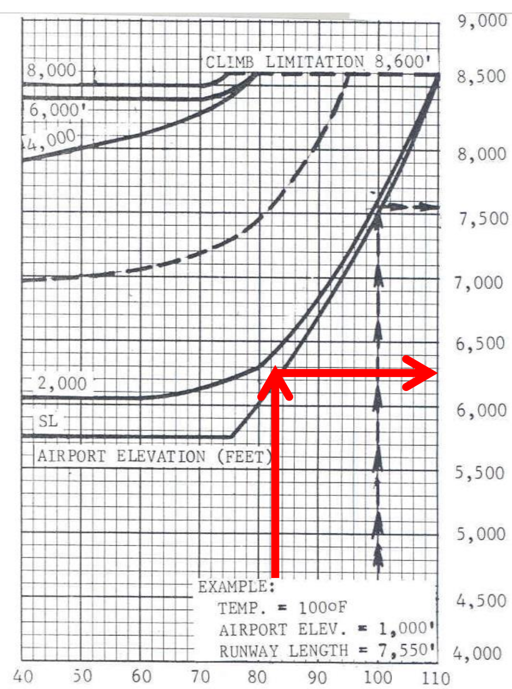


Figure F-2: **75% of fleet at 90% Useful Load**

Table F-4: Runway Length for 75% of fleet at 60% and 90% useful load

Category	Runway Length
75% of fleet at 60% Useful Load	4,677 feet
75% of fleet at 90% Useful Load	6,266 feet

Note: Airport elevation above mean sea level = 533.5 ft,
Mean daily maximum temperature of the hottest month at the airport = 83º F

Source: FAA Advisory Circular (AC) 150/5325-4B, Runway Length Requirements for Airport Design

The runway length recommendations summarized in **Table F-4** are dependent on meeting the operational requirements of the family grouping at a certain percentage of useful load (i.e., 60% or 90% useful load). The useful load of an aircraft is defined as the difference between the maximum allowable structural gross weight and the operating weight empty. It is the load that can be carried by the aircraft comprised of passengers, useable fuel, and cargo.

Generally, longer haul lengths require higher useful loads to accommodate fuel carriage and consumption. Due to the insufficient data available from TFMSC and FlightAware, there is not enough information available to accurately determine if jet aircraft at the Airport are operating at 90% of their useful load. For this reason, the 60% useful load runway length is used. The result of **Step 4** is a runway length of 4,677'.

F.3.5 (AC 150/5325-4B STEP 5) – APPLY ANY NECESSARY ADJUSTMENT TO THE OBTAIN RUNWAY LENGTH

The runway lengths obtained from **Figures F-1** and **F-2** are based on a runway with no wind, a dry runway surface, and zero effective runway gradient. In order to determine the recommended runway length, adjustments for effective runway gradient and wet and slippery runway conditions need to be applied. These increases are not cumulative since the runway gradient adjustment applies to takeoffs and the wet and slipper runway conditions adjustment applies to landings. After both adjustments have been independently applied, the larger resulting runway length becomes the recommended runway length. The runway length adjustments are as follows:

Effective Runway Gradient (Takeoff Only)

Based on Chapter 3 of AC 150/5325-4B, the runway length obtained from **Step 4** is increased at a rate of 10 feet for each foot of elevation difference between the high and low points of the runway centerline. The high point elevation on Runway 16/34 is 533.5 feet and the low point elevation is 500.8 feet. This results in an increase of 327 feet to the runway length found in **Step 4**. The adjusted runway length based on effective runway gradient is 5,004'.

Wet and Slippery Runways (Landing Only)

By regulation, the runway length for turbojet-powered airplanes obtained from the "60 percent useful load" curves are increased by 15 percent or up to 5,500 feet, for wet and slippery conditions, whichever is less. When the 15 percent increase is applied to the runway length found in **Step 4**, the resulting adjusted runway length is 5,400 feet.

F.3.6 AC 150/5325-4B RECOMMENDED RUNWAY LENGTH

Based on the preceding analysis, the largest runway length is based on wet and slippery conditions. Therefore, the recommended runway length for RBG based on AC 150/5325-4B is **5,400 feet**.

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