EASTERN OREGON REGIONAL AIRPORT
AIRPORT MASTER PLAN

CITY OF PENDLETON

OCTOBER 2018

CENTURY WEST ENGINEERING

EASTERN OREGON REGIONAL AIRPORT

AIRPORT MASTER PLAN REPORT

FINAL REPORT, OCTOBER 2018
PREPARED FOR

EASTERN OREGON
REGIONAL AIRPORT

PREPARED BY

CENTURY WEST ENGINEERING

1020 SW Emkay Drive #100 | Bend, OR 97239 | 541.322.8962

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Chapter 1 – Introduction & Project Overview

Chapter 1 – Introduction and Project Overview

The City of Pendleton updated the Airport Master Plan for Eastern Oregon Regional Airport (PDT) in cooperation with the Federal Aviation Administration (FAA) to address the airport's needs for the next twenty years. The Airport Master Plan provides specific guidance in making the improvements necessary to maintain a safe and efficient airport that is economically, environmentally, and socially sustainable.

Study Purpose

The purpose of the Airport Master Plan is to define the current, short-term, and long-term needs of the airport through a comprehensive evaluation of facilities, conditions, and FAA airport planning and design standards. The study will also address elements of local planning (land use, transportation, environmental, economic development, etc.) that have the potential of affecting the planning, development and operation of the airport. FAA Advisory Circular 150/5070-6B "Airport Master Plans" defines the specific requirements and evaluation methods established by FAA for the study.

Project Need

Eastern Oregon Regional Airport is included in the federal airport system—the National Plan of Integrated Airport Systems (NPIAS). Participation in the NPIAS is limited to public use airports that meet specific FAA activity criteria. There are currently 3,331 NPIAS facilities including airports, heliports and seaplane bases.[1] The FAA recognizes that NPIAS airports are vital to serving the air transportation needs of the public and that access to the nation's air transportation system is not limited to commercial air service.

[1] 2015-2019 National Plan of Integrated Airport Systems

The primary division for NPIAS airports is "Primary" and "Nonprimary." The 389 Primary airports account for about 12 percent of the overall NPIAS system, but provide the majority of commercial air service throughout the system. The 2,942 Nonprimary airports include General Aviation, Reliever, and Nonprimary Commercial Service (2,500 to 10,000 annual passenger enplanements). Additional designations reflect the airport's functional (asset) role (e.g., national, regional, local, basic) and service level (e.g., commercial, reliever, general aviation).

According to current NPIAS report (2015-2019), Eastern Oregon Regional Airport has the following NPIAS classification/designation:

- Category: **Non Primary**
- Asset Role: **Regional**
- Service Level: **Commercial Service – Nonprimary**

Eastern Oregon Regional Airport currently provides the only scheduled commercial air service in eastern Oregon with daily flights to Portland International Airport. The air service is partially subsidized through a federal Department of Transportation Essential Air Service (EAS) grant. The nearest other commercial air service airports are located in Pasco and Portland. Additional information about commercial air service is provided in the Aviation Activity Forecasts (Chapter 3).

NPIAS airports are eligible for federal funding of improvements through FAA programs such as the Airport Improvement Program (AIP). However, to maintain eligibility for funding, the FAA requires airports to periodically update their master plans as conditions change in order to maintain current planning that is consistent with applicable FAA technical standards, policies and regulations.

This project updates the 2002 Airport Master Plan,[2] which has provided the primary airport planning guidance for the Airport over the last thirteen years. As conditions have changed in recent years, the need exists to update the long-term planning for the Airport. In addition to addressing changing local conditions, updated FAA standards, current trends within the aviation industry, and the recent addition of unmanned aerial systems (UAS) activity has been reflected in updated airport planning. The 2015-2035 Airport Master Plan and Airport Layout Plan (ALP) replaces the previous master plan and meets the FAA's requirement to maintain current planning.

[2] "Eastern Oregon Regional Airport at Pendleton." *Airport Master Plan* (2002), prepared by David Evans and Associates, Mead & Hunt Inc., and Pavement Services Inc.

Project Funding

Funding for the Airport Master Plan Update is provided through an FAA Airport Improvement Program (AIP) grant (95%) with a local match (5%) provided by the City of Pendleton. The AIP is a dedicated fund administered by FAA with the specific purpose of maintaining and improving the nation's public use airports. The AIP is funded exclusively through fees paid by users of general aviation and commercial aviation and the funds can only be for eligible aviation related projects.

Airport Ownership

The City of Pendleton is the owner and operator of Eastern Oregon Regional Airport (PDT). As the airport owner (sponsor) of record, the City of Pendleton is responsible for conforming to all applicable FAA regulations, design standards, and grant assurances.

History of Airport and Development

According to local accounts, the original Pendleton airport site was developed in 1934 on approximately 200 acres. Oregon Historical Society[3] records indicate that the U.S. Army Corps of Engineers constructed Pendleton Field/Pendleton Army Air Base on the site in 1941, which included new runways, hangars, and other facilities. In June 1941, the U.S. Army Air Force 17th Bombardment Group was transferred to Pendleton Field. Members of this group later participated in the World War II, Doolittle raid on Tokyo. In February 1942, the Bombardment Group was transferred and Pendleton Field became a training airport for fighter pilots. The airport was converted to a civilian airport after the war ended in 1945 and ownership was transferred to the City of Pendleton. In 1953, the airport terminal and administration building was constructed and has since been expanded. Other major improvements include the airport fire station (1960) and the airport maintenance facility (1984). The City of Pendleton has continued to modernize every part of the airport including: the runway-taxiway system, aircraft parking aprons, airfield lighting, weather observation and navigational aids, terminal building, support facilities, and utilities. Improvements completed since the last master plan update includes the closure of Runway 16/34, which was converted to a taxiway (Taxiway G) with pavement sealcoat and new taxiway markings; installation of new perimeter fencing; Aircraft Rescue and Firefighting (ARFF) building expansion; acquisition of a new ARFF vehicle; and pavement maintenance.

[3] Howdyshell, Bus. "Pendleton Field." *Oregon History Project*. Ed. Cain Allen. 1 Jan. 2005. Web. 21 Jan. 2015.

History of Airport Planning

Planning for Eastern Oregon Regional Airport has been updated on a regular basis since the 1970s. The city's sustained commitment to long-term planning is reflected in the condition, configuration, and functional capabilities of the airport. The current airport master plan was completed in 2002 and the Airport Layout Plan (ALP) drawing was last revised in 2007. These documents will serve as primary data sources for this project. The previous airport master plan, completed in 1996,[4] project design drawings, aerial photography, available mapping and survey data, and local planning studies will also be used as primary information sources for preparing the updated Airport Master Plan and ALP.

Study Organization

Work in progress on the Airport Master Plan Update was documented in a series of technical memoranda (presented as draft chapters). The chapters were prepared to document progress in the study, facilitate the review of preliminary results, and to obtain input early and throughout the master planning process. At the end of the study, the draft chapters were updated as needed, and incorporated into the draft final Airport Master Plan technical report.

The draft chapters and supporting documents were prepared over a period of approximately 18 months. Each draft chapter was reviewed locally, and by the FAA and Oregon Department of Aviation (ODA) for consistency with federal and state regulations, policies, and standards.

The 2015-2035, Eastern Oregon Regional Airport Master Plan includes the following chapters:

- *Chapter 1 – Introduction and Project Overview*
- *Chapter 2 – Inventory of Facilities*
- *Chapter 3 – Aviation Activity Forecasts*
- *Chapter 4 – Unmanned Aircraft Systems Evaluation*
- *Chapter 5 – Demand-Capacity & Facility Requirements Analyses*
- *Chapter 6 – Environmental Review*
- *Chapter 7 – Airport Development Alternatives*
- *Chapter 8 – Airport Layout Plan and Terminal Area Plans*
- *Chapter 9 – Land Use Planning*
- *Chapter 10 – Airport Financial Plan/CIP*
- *Chapter 11 – FAA Compliance Review and Solid Waste Recycling Plan*
- *Appendix – Wildlife Management Plan*
- *Technical Appendices*

[4] Eastern Oregon Regional Airport at Pendleton, Master Plan Update (Bucher, Wills & Ratliff, 1996)

Local Citizen Participation

The City of Pendleton is committed to an inclusive, transparent planning process and made all project work products available for public review. The public involvement element of the Airport Master Plan Update provided several ways for all interested individuals, organizations, or groups to participate in the project.

First, all draft work products developed during the project were available for public review and comment. Links to the documents were posted on the City's webpage to allow for convenient access, review and comment. Copies of the draft work products were also available for public review and comment at the Airport Administration office throughout the project. Comment forms were available for both electronic and printed versions of the draft work products.

Second, a series of public meetings were held during the project to facilitate public participation. The public meetings included periodic study sessions and briefings with the City of Pendleton and separate project meetings and open houses. The project team presented information, provided updates on study progress, and identified upcoming decision points during these meetings. The project team utilized a variety of tools to encourage citizen participation, including surveys, project newsletters, and project updates posted on the City's webpage.

Third, a local planning advisory committee (PAC) was formed by the City of Pendleton to assist the project team in reviewing draft technical working papers and to provide input into the planning process. The composition of the PAC was intended to provide an effective blend of community members including representatives of the City's Airport Commission, airport users, neighbors, local business, local government representation, and other interests. Representatives from the FAA Seattle Airports District Office and the Oregon Department of Aviation (ODA) served as ex officio members of the PAC. The PAC met throughout the project, reviewed and commented on draft work products, discussed key project issues and provided local knowledge and expertise to the planning process.

The PAC meetings were open to public; however, since the meetings are organized as work sessions, the time allocated for public comment was limited. Expanded public comment periods were provided in the public meetings that coincide with specific PAC meetings to ensure that all interested stakeholders had an opportunity to participate in the project.

Summary

The FAA-defined airport master planning process required a sequential, systematic approach, which has led to a selection of a preferred development option for the airport that was integrated into the Airport Layout Plan (ALP) and Airport Capital Improvement Program (ACIP). To meet this goal, the Airport Master Plan Update:

- *Provided an updated assessment of existing facilities and activity;*
- *Forecasted airport activity measures (design aircraft, based aircraft, aircraft operations, etc.) for the current 20-year planning period;*
- *Examined previous planning recommendations (2002 Airport Master Plan) as appropriate, to meet the current and projected airport facility needs, consistent with FAA airport design standards;*
- *Determined current and future facility requirements for both demand-driven development and conformance with FAA design standards;*
- *Provided consistency between airport planning and land use planning to promote maximum compatibility between the airport and surrounding areas;*
- *Prepared an updated Airport Layout Plan (ALP) drawing set to accurately reflect current conditions and master plan facility recommendations;*
- *Developed an Airport Capital Improvement Program (ACIP) that prioritizes improvements and estimates project development costs and funding eligibility for the 20-year planning period; and*
- *Evaluated airport sponsor compliance with FAA Airport Improvement Program (AIP) grant assurances.*

The preparation of this document may have been supported, in part, through the Airport Improvement Program financial assistance from the Federal Aviation Administration as provided under Title 49, United States Code, section 47104. The contents do not necessarily reflect the official views or policy of the FAA. Acceptance of this report by the FAA does not in any way constitute a commitment on the part of the United States to participate in any development depicted therein nor does it indicate that the proposed development is environmentally acceptable with appropriate public laws.

Chapter 2 – Inventory of Existing Conditions

Chapter 2 – Inventory of Existing Conditions

*The purpose of this chapter is to document the existing facilities and conditions at Eastern Oregon Regional Airport (**Airport Identifier Code: PDT**). The Airport is owned and operated by the City of Pendleton, Oregon.*

This project replaces the 2002 Airport Master Plan Update,[1] which will serve as a primary source for inventory data. However, where available, more current or comprehensive data have been included in the chapter to illustrate current conditions. Existing airfield facilities were examined during on-site inspections to update facility inventory data. The consultants also worked closely with City staff to review the current facility and operational data maintained by the City.

Airport Setting

Pendleton is located in northern Umatilla County, approximately 209 miles east of Portland on U.S. Interstate 84 (I-84), the main east-west travel route across northern Oregon. Eastern Oregon Regional Airport and the adjacent City of Pendleton Airport Industrial Park are located approximately three miles northwest of downtown Pendleton, within the Pendleton city limits. A location and vicinity map is provided in **Figure 2-1**.

[1] Eastern Oregon Airport Master Plan Update (David Evans and Associates, Mead & Hunt Inc., and Pavement Services Inc. , 2002)

Figure 2-1: Airport Location Map

The airport is located on an elevated plateau at approximately 1,490 feet above mean sea level (MSL), approximately 300 feet above downtown Pendleton (Elevation 1,200 feet MSL). Surface access to the airport is provided via Airport Road, which connects to U.S. Highway 30 and Interstate 84 (I-84).

Umatilla County was formed in 1862 from a portion of Wasco County. Several adjacent counties (Grant, Morrow, Wallowa, and Union) were later formed from portions of Umatilla County. Pendleton was selected as the county seat in 1868 and the city was officially incorporated in 1880. City Hall was constructed in 1908 and housed all city services including Police, Fire and the School District. In 1948, the community elected its first City Manager and council form of government.

Umatilla County has a land area of 3,231 square miles extending from the Columbia River at its northwest corner, east to the western slopes of the Blue Mountains, and south toward east-central Oregon. The Umatilla County Comprehensive Plan indicates that approximately 25 percent of the county land area is under the control of other government entities (e.g., Umatilla Indian Reservation, and the Umatilla and Wallowa-Whitman National Forests).

The current Portland State University (PSU) certified estimate of population (July 1, 2014) for Pendleton was 16,700. The 2014 PSU certified estimate of population for Umatilla County was 78,340. The 2010 U.S. Census for Pendleton (incorporated area only) was 16,612 and Umatilla County was 75,889. Current PSU estimates indicate that both Pendleton and Umatilla County have experienced growth in population since the 2010 Census. Pendleton and nearby Hermiston are the two largest incorporated cities in Umatilla County, accounting for more than 40 percent of county population and providing a variety of commerce, government, education, and medical services.

The region's major industrial segments include manufacturing; warehousing and distribution; clean technology; agriculture and food processing; and technology (hi-tech, bio-tech, data centers, etc.). The Eastern Oregon Correctional Institution, a medium security state facility, is among Pendleton's largest employers. The main campus of Blue Mountain Community College (BMCC), located in Pendleton, provides a variety of educational and vocational programs targeted to students throughout northeastern Oregon. The Pendleton Round-Up is a premier professional rodeo event that draws more than 50,000 people each year to the week-long event.

The 2014 FAA designation of the Pendleton UAS test range provides unique opportunities to establish a new technology-driven industry in northeastern Oregon. A coordinated effort involving local government, the UAS industry, educational institutions and the community will be required to maximize the economic potential of this fledgling industry in the region, as it evolves toward commercial viability within civil aviation.

Physical Geography

Pendleton is located in the Columbia Plateau, also known as the Columbia Basin. The origin of the Columbia Basin date back tens of millions of years, and was subsequently transformed through a series of major geologic events, including the Great Missoula Floods, occurring 14,000 to 18,000 years ago. The wide basalt plateau cut by the Columbia River stretches across portions of Washington, Oregon, and Idaho. The Umatilla River flows from the Blue Mountains in the east to the Columbia River to the west, through the City of Pendleton.

Climate

Pendleton has a semi-arid climate that experiences short cool winters with moderate amounts of snow and hot dry summers. Historic climatic data for Pendleton Eastern Oregon Regional Airport (Observation Station 356546) is available from 1928 through 2015.[2] The data indicate that July and August are typically the warmest months; December and January are the coldest. On a monthly basis, the average maximum temperature is 88.4 degrees Fahrenheit (July) and the average minimum temperature is 26.2 degrees (January). Pendleton averages 12.33 inches of precipitation and 16.6 inches of snowfall annually. Available wind data indicate that prevailing winds generally follow an east-west pattern, favoring Runway 7/25.

Historical Aviation Activity

As noted in the Introduction Chapter, Eastern Oregon Regional Airport has been in continuous aviation use since the construction of the Army Air Base in 1941, and perhaps as early as 1934 when the airfield was first developed.

Eastern Oregon Regional Airport is the largest public airport in northeast Oregon, and the only airport with scheduled passenger air service in north eastern Oregon. There are twelve public-use airports located within 60 nautical (air) miles of Pendleton, including two airports—Tri-Cities Airport (Pasco) and Walla Walla Regional Airport—that also provide commercial air service. A detailed analysis of aviation activity data and the service area defined for the Airport will be presented in the updated Aviation Activity Forecasts (Chapter 3).

Eastern Oregon Regional Airport currently accommodates a wide variety of aeronautical activity, including small single- and multi-engine aircraft, business class turbine aircraft (business jets and turboprops), civilian helicopters, military fixed wing aircraft and helicopters, and unmanned aerial systems (UAS). In addition to scheduled passenger service, the Airport has several commercial tenants

[2] Western Regional Climatic Center, Observation Station 356546 (1928-2015)

providing aerial application, aircraft maintenance, fueling, flight training, and other services which generate local flight activity and attract itinerant users. The Airport also accommodates the Oregon Army National Guard aviation facility and is the designated airport for the Pendleton Unmanned Aerial Systems (UAS) Test Range.

The **2002 Airport Master Plan** estimated that Eastern Oregon Regional Airport had 97 based aircraft, 34,537 aircraft operations, and 14,007 enplaned passengers in 1999. The 1999 aircraft operations consisted of 7,155 commercial, 26,132 general aviation, and 1,250 military operations.

The FAA Airport Record Form (5010-1) lists 51 based aircraft and 14,638 aircraft operations (takeoffs and landings) for the 12 months ending in January 2014. The Pendleton Air Traffic Control Tower recorded 15,387 aircraft operations in 2013. An updated based aircraft count provided by airport management in February 2015 lists a total of 67 aircraft. Recent historical airport activity is summarized in **Table 2-1**.

TABLE 2-1: BASED AIRCRAFT AND OPERATIONS - EASTERN OREGON REGIONAL AIRPORT

ACTIVITY TYPE	ACTIVITY LEVEL	
Based Aircraft Count	Airport Master Record *(12 months ending 1/2/14)*	Updated Airport Count *(February 2015)*
Single-Engine Piston	25	39
Multi-Engine Piston	1	2
Turboprop	0	1
Turbojet	0	0
Rotorcraft	10	14
Ultralight/Experimental	4	5
Glider	3	0
Military	7	6
Total Based Aircraft	**51**	**67**
Annual Aircraft Operations 1. FAA Air Traffic Activity System (ATADS): PDT ATCT CY 2013	14,638	15,387[1]

Airfield Facilities

Eastern Oregon Regional Airport has two intersecting runways. The runway system has extensive lighting and instrumentation and is served by a taxiway system that provides access to all developed areas of the airfield. In 2013, a third runway (16/34) was closed and converted to a taxiway (Taxiway G) that provides access to the north side of the airfield.

Eastern Oregon Regional Airport has an air traffic control tower (ATCT) that operates 14 hours daily (0600-2000 local time). During the hours of ATCT operation, the airport is a controlled field pilots are required to obtain tower clearances for takeoffs, landings and taxiing (ground control). During the hours that the ATCT is not operating, pilots are required to monitor traffic and radio communication through the common traffic advisory frequency (CTAF). **Table 2-2** summarizes airport data. **Figures 2-2** and **2-3** provide views of existing airfield facilities and an enlarged view of terminal area facilities.

TABLE 2-2: AIRPORT DATA

AIRPORT NAME/DESIGNATION	EASTERN OREGON REGIONAL AIRPORT (PDT)
Airport Owner	City of Pendleton
Date Established	1941
Airport Category	National Plan of Integrated Airport Systems (NPIAS): Nonprimary Commercial Service Airport FAA Airport Reference Code: C-III (as depicted on 2002 ALP) Oregon Aviation Plan (207): Category 1 – Commercial Service
Airport Acreage	2,273 Acres (FAA Airport Master Record Form 5010-1)
Airport Reference Point (ARP) Coordinates	N 45° 41.69' W 118° 50.58'
Airport Elevation	1,497 feet MSL[3]
Airport Traffic Pattern Configuration/Altitude	Left Traffic 2,500 feet MSL / 1,000 feet above ground level (AGL)
Airport Communication	Air Traffic Control Tower (0600-2000 local) 119.7 MHz Ground Control (0600-2000 local) 121.9 MHz Common Traffic Advisory Frequency (2000-0600 local) 119.7 MHz Unicom 122.95 MHz Chinook App/Dep Control (133.15 MHz) 1400-0600 Zulu Seattle App/Dep Control (132.6 MHz) 0600-1400 Zulu
Airport Weather	Automated Surface Observation System (ASOS) 118.325 MHz (541) 278-2329 HIWAS (PDT) 114.7 MHz

[3] FAA Airport/Facility Directory (A/FD)

Figure 2-2: Existing Conditions

Figure 2-3: Existing Conditions (Terminal Area)

Runways

Eastern Oregon Regional Airport has two runways that are equipped with a full array of lighting and visual approach aids. The primary runway (7/25) is oriented in an east-west direction (70-250 degree magnetic heading) and the secondary runway (11/29) is oriented in a northwest-southeast direction (110-290 degree magnetic heading). The secondary runway intersects with the primary runway approximately 1,470 feet from its west end. The runways and other major airfield pavements are designed to accommodate large general aviation aircraft and heavier military and transport category aircraft. **Table 2-3** summarizes the current runways at the Airport.

Runway 7/25

Runway 7/25 is 6,301 feet long and 150 feet wide. The runway has an asphalt surface that is transverse-grooved to improve wet runway braking action on landings and improve directional control for aircraft during takeoff and landing operations by reducing hydroplaning. The runway has an effective gradient of 0.19 percent, with the high point (1,483 feet MSL) located at its east end (Runway 25 threshold). The runway was rehabilitated with a 3-inch asphalt overlay in 2005 and is in good condition.

The runway has precision instrument (PIR) markings on the Runway 25 end and non-precision instrument (NPI) markings on Runway 7, which are consistent with current instrument approach capabilities. The runway markings (white paint) include runway designation numbers, threshold markings, touchdown zone markings (Runway 25), aiming point markings, centerline stripe, and side stripes. Yellow taxiway lead-in lines are painted on the runway at the two interior exit taxiways (Taxiway B and G). All runway markings are consistent with FAA standards for configuration, color, and approach type (precision/non-precision instrument). The markings were observed to be in good to fair condition during a recent site visit. Per FAA standards, the markings for the primary runway (7/25) take precedence over the secondary runway (11/29) in areas where the runways intersect.

The runway is equipped with four distance remaining signs (black background/white numbers) on its north side. The lighted dual-sided signs indicate the remaining useable runway to pilots in 1,000-foot increments.

The runway is served by two partial-length south parallel taxiways (Taxiway A and F) located at each end and series of access taxiways connecting the runway/parallel taxiways to the terminal area and other developed landside areas. The runway has four 90-degree exit taxiway connections.

Note: Runway 7/25 will be re-designated to "8/26" due to a change in magnetic variation, either as part of a future rehabilitation or markings upgrade project.

Runway 11/29

Runway 11/29 is 5,851 feet long and 100 feet wide. Runway 29 has a 455-foot displaced threshold, which reduces the runway length available for landing to 5,126 feet. All other operations on Runway 11/29 have the full 5,851 feet of runway available. An aircraft turnaround is located adjacent to the Runway 11 threshold (north side) to facilitate aircraft movement in the absence of dedicated taxiway access. The turnaround is primarily used by aircraft back-taxiing on the runway (for takeoff on Runway 11) or by aircraft rolling out after landing on Runway 29 that are unable to use the last available exit taxiway (Taxiway B).

The runway has an asphalt (bituminous surface treatment) surface that is transverse-grooved to improve wet runway braking action on landings and improve directional control for aircraft during takeoff and landing operations by reducing hydroplaning. The runway has an effective gradient of 0.14 percent, with the high point (1,493 feet MSL) located at the Runway 25 threshold. The runway was rehabilitated in 1999 and is in good condition.

The runway is served by a partial length parallel taxiway (Taxiway A) on its west side that extends from the terminal apron to Taxiway B and the intersection with Runway 7/25. The runway has a total of three access taxiway connections and a portion of the terminal apron directly abuts the runway near the Runway 29 displaced threshold.

The runway is equipped with five distance remaining signs (black background/white numbers) on its west side. The lighted dual-sided signs indicate the remaining useable runway to pilots in 1,000-foot increments.

The runway has non-precision instrument (NPI) markings, which are consistent with current instrument approach capabilities. The runway markings (white paint) include runway designation numbers, aiming point markings, centerline stripe, side stripes and displaced threshold markings (Runway 29). The 455-foot displaced threshold on Runway 29 is marked by a threshold bar and lead-in arrows defining the landing threshold. The runway pavement between the displaced threshold and the physical end of pavement (south end) is available for takeoff on Runway 29 and landing rollout for Runway 11.

Aircraft hold lines (yellow paint) are located on the runway adjacent to the intersection with Runway 7/25 and approximately 75 feet south of the displaced threshold bar on Runway 29. Aircraft hold lines provide clear visual information to pilots and airport ground vehicles required to hold short of an active runway. Yellow taxiway lead-in lines are painted on the runway at Taxiway E. All runway markings are consistent with FAA standards for configuration, color, and approach type. The markings were observed to be in good to fair condition during a recent site visit.

TABLE 2-3: RUNWAY DATA - EASTERN OREGON REGIONAL AIRPORT

RUNWAY 7/25	
Dimensions	6,301' x 150'
Bearing	N 89°57'00"
Effective Gradient	0.19%
Surface/Condition	Asphalt (Porous Friction Course) - Good/Fair
Pavement Strength	115,000 lbs. Single Wheel 132,000 lbs. Dual Wheel 167,000 lbs. Dual Single Wheel (Tandem) 210,000 lbs. Dual Double Wheel (Tandem)
Markings	Precision Instrument (PIR) Rwy 25 - Good/Fair Condition Non-Precision Instrument (NPI) Rwy 7 - Good/Fair Condition
Lighting	High Intensity Runway Edge Lighting (HIRL); Threshold Lighting Approach Lighting • Runway 7 – Medium Intensity Approach Lighting (MALS-R) • Runway 25 – Omni Directional Approach Lighting System (ODALS) Visual Guidance Indicators • Runway 7 – Visual Approach Slope Indicator (VASI 4) • Runway 25 – Precision Approach Slope Indicator (PAPI 4)
Signage	Runway Distance Remaining Signs, Runway Hold Position Signs, Directional, Location Signs
RUNWAY 11/29	
Dimensions	5,581' x 100' (455-foot displaced threshold on Rwy 29 end)
Bearing	N 308°20'00"
Effective Gradient	0.14%
Surface/Condition	Asphalt (Grooved) / Good
Pavement Strength	70,000 lbs. Single Wheel 120,000 lbs. Dual Wheel 152,000 lbs. Dual Single Wheel (Tandem) 122,000 lbs. Dual Double Wheel (Tandem)
Markings	Non-Precision Instrument (NPI) - Good/Fair Condition
Lighting	Medium Intensity Runway Edge Lighting (HIRL); Threshold Lighting Runway End Identifier Lights (REIL) – Rwy 11 and 29 Visual Guidance Indicators • Precision Approach Slope Indicator (PAPI 4) – Rwy 11 and 29
Signage	Runway Distance Remaining Signs, Runway Hold Position Signs, Directional, Location Signs

Runway Wind Coverage

It is generally preferable for aircraft to land and takeoff directly into the wind, although varying wind conditions often require crosswind operations at airports. When wind conditions exceed the capabilities of a specific aircraft, use of a crosswind runway (when available) may occur. At airports with single runways, occasional periods of strong crosswinds often limit operations until conditions improve.

The FAA-recommended planning standard is that primary runways should be capable of accommodating at least 95 percent of wind conditions within the prescribed crosswind component. This component is based on a direct crosswind (90 degrees to the direction of flight) of 10.5 knots (12 miles per hour) for small aircraft and 13 knots (15 miles per hour) for larger general aviation aircraft. Transport and larger military aircraft are typically designed to accommodate higher crosswind components. Aircraft are able to tolerate increasingly higher wind speeds as the crosswind angle is reduced and moves closer to the direction of flight.

The wind rose depicted on the 2002 Airport Layout Plan (Sheet 2, Airport Data Summary) graphically illustrates the favorable relationship between the runway alignments and local wind conditions. Virtually identical wind coverage is provided for each defined crosswind component under both visual and instrument conditions, indicating that local wind patterns do not change significantly as weather conditions deteriorate. **Table 2-4** summarizes the wind data for Runway 7/25 and Runway 11/29 for visual (VFR), instrument (IFR) and combined (VFR and IFR) weather conditions for small and large aircraft.[4] Wind data (14,608 observations) for Eastern Oregon Regional Airport indicate prevailing winds are generally west-east, closely aligned with Runway 7/25. The combination of Runway 7/25 and Runway 11/29 captures approximately 99 percent of local wind conditions.

[4] NOAA National Climatic Center Data for Eastern Oregon Regional Airport obtained from 2002 Airport Master Plan.

TABLE 2-4: RUNWAY WIND COVERAGE - EASTERN OREGON REGIONAL AIRPORT

RUNWAY 7/25	CROSSWIND COMPONENTS	
WEATHER CONDITIONS	10.5 KNOTS (12 MPH)	13 KNOTS (15 MPH)
VFR Weather Conditions	97.2	98.7
IFR Weather Conditions	96.2	98.5
All-Weather Conditions	95.9	98.0
RUNWAY 11/29	CROSSWIND COMPONENTS	
WEATHER CONDITIONS	10.5 KNOTS (12 MPH)	13 KNOTS (15 MPH)
VFR Weather Conditions	85.9	92.8
IFR Weather Conditions	97.3	98.0
All-Weather Conditions	87.8	93.1
Source: 2002 Eastern Oregon Regional Airport ALP		

Taxiways

Eastern Oregon Regional Airport has an extensive taxiway system, including two sections of parallel taxiway for Runway 7/25 that provide access to the runway ends; a partial length parallel taxiway for Runway 11/29; and a series of access taxiways and taxilanes connecting airside and landside facilities on the airfield.

All major taxiways have standard markings including centerline stripe, enhanced centerlines (near hold areas), edge markings, runway holding position markings, and surface painted holding position markings (denoting runway numbers at taxiway connections to runway). The striping and markings are generally in fair to good condition. All taxiways connecting to a runway are equipped with lighted mandatory hold position signs.

Table 2-5 summarizes the current taxiways at the Airport. **Figures 2-2 and 2-3**, presented earlier in the chapter, depict the major taxiways on the airfield.

TABLE 2-5: TAXIWAY DATA - EASTERN OREGON REGIONAL AIRPORT

TAXIWAY	DESCRIPTION	DIMENSIONS/CONFIGURATION
Taxiway A	Partial–Length Parallel Taxiways for Runways 7/25 (west end) and 11/29 (mid-runway)	Approximate length 2,000 feet along Runway 11/29 and 1,400 feet along 7/25; width 50 feet Asphalt surface w/centerline stripe and edge markings (yellow); MITL (blue)
Taxiway B	Access taxiway connecting the Oregon Army National Guard facility to Taxiway A and Runway 7/25; south section of Taxiway B closed	Approximate length 500 feet from the National Guard gate to the runway hold line; width 70 feet Asphalt surface w/centerline stripe and edge markings (yellow); MITL (blue)
Taxiway D	East-west access taxiway located north of the terminal and general aviation apron, extending from closed section of Taxiway B to Runway 11/29 and Taxiway G	Approximate length 2,675 feet (between closed southern section of Taxiway B and Taxiway G); width 35 feet Asphalt surface w/centerline stripe and edge markings (yellow)
Taxiway E	Access taxiway connecting the terminal apron to Runway 11/29, Taxiway G, and the east agricultural apron/UAS facilities	Approximate length 1,200 feet; width 40 feet Asphalt surface w/centerline stripe and edge markings (yellow)
Taxiway F	Partial–Length Parallel Taxiway for Runway 7/25 (east end), extending east of Taxiway G to Runway 25 threshold	Length 2,032; width 50 feet Asphalt surface w/centerline stripe and edge markings (yellow); MITL (blue)
Taxiway G	Access taxiway connecting the north and south sections of the airfield. Connections to Taxiways D, E, F, and Runway 7/25	Length 4,000 feet; width 50 feet Asphalt surface w/centerline stripe and edge markings (yellow); no edge lighting

Taxiway A

Taxiway A is a partial-length west/south parallel taxiway for Runway 7/25 and Runway 11/29. Both sections of Taxiway A are 50 feet wide with a runway separation of 400 feet. Taxiway A is equipped with medium intensity taxiway lighting (MITL).

Runway 7/25. Taxiway A extends west from Taxiway B to the end of Runway 7 with two 90-degree connecting taxiways.

Runway 11/29. Taxiway A extends from the Taxiway E to Taxiway B and connects to the runways via these taxiways.

Taxiway B

Taxiway B is an access taxiway that connects the Oregon Army National Guard (ORARNG) apron to Taxiway A and the intersection of both runways. Taxiway B is approximately 70 feet wide. The ORARNG facility is fully fenced with an automated sliding gate at its north apron connection to Taxiway B. The section Taxiway B between the runway and Taxiway A is equipped with medium intensity taxiway edge lighting (MITL). The section of Taxiway B located between the ORARNG apron and Taxiway A is used exclusively by the military and is not lighted. The section of Taxiway B located south of the ORARNG apron is closed.

Taxiway D

Taxiway D is an access taxiway 35 feet wide and extends from the closed section of Taxiway B (south of the ORARNG facilities) north of the terminal and general aviation apron, and continues east beyond Runway 11/29 to Taxiway G. Taxiway D is equipped with taxiway edge reflectors.

Taxiway E

Taxiway E is an access taxiway 40 feet wide and extends from the terminal apron to Runway 11/29 and continues east to Taxiway G. Taxiway E is not equipped with edge lighting. Taxiway E has two aircraft hold areas located adjacent to Taxiways A and D, and on the west side of Taxiway G.

Taxiway F

Taxiway F is a partial-length south parallel taxiway (50 feet wide) for Runway 7/25, with a 400-foot runway separation. Taxiway F extends from Taxiway G to the Runway 25 threshold. Taxiway F is equipped with medium intensity taxiway lighting (MITL). Taxiway F accommodates periodic use as a launch facility for UAS operations and is closed by NOTAM during these periods.

Taxiway G

Taxiway G is an access taxiway 50 feet wide and approximately 4,000 feet long. The taxiway extends from Taxiway D to near the north end of the former Runway 16/34. Taxiway G provides access to Runway 7/25 directly and via Taxiway F, and to the agricultural apron, UAS facilities located south of Runway 7/25, and future UAS facilities located north of Runway 7/25. Taxiway G is not equipped with edge lighting.

Taxilanes

Eastern Oregon Regional Airport has several access taxilanes serving landside facilities on the airport. The general aviation aircraft tiedown apron (west section of main apron) is configured with five north-south stub taxilanes that connect to Taxiway D. The apron taxilanes provide access to adjacent aircraft parking rows and hangars located along the south and west sides of the apron. Three hangar taxilanes extend from the west end of the main apron and one taxilane extends beyond the west end of Taxiway D. These taxilanes provide access to several aircraft storage hangars. There are no taxilanes defined on the concrete sections of the main apron between the terminal apron and tiedown apron.

Several taxilanes are marked with centerline stripes (condition ranging from good to poor (worn)). The hangar taxilanes appear to be in fair to poor condition, consistent with age and use. The tiedown apron taxilanes are in good condition (reconstructed in 1998).

Aircraft Apron

Eastern Oregon Regional Airport has an expansive main apron area located south of the runway-taxiway system that includes terminal apron and a general aviation apron with large and small aircraft tiedowns. The main apron consists of approximately 126,690 square yards[5], which is approximately 26 acres of surface area.

The Airport has two other apron areas: an agricultural aircraft apron located east of Taxiway G and south of Runway 7/25 and the Oregon Army National Guard (ORARNG) apron located northwest of the main apron, south of Runway 7/25 and Taxiway A. The ORARNG apron is configured with six aircraft parking positions designed to accommodate Boeing CH-47 Chinook tandem rotor helicopters.

Table 2-6 summarizes the existing public use apron facilities at the airport.

[5] 2014 Pavement Evaluation/Maintenance Management Program (Pavement Consultants Inc., November 2014)

TABLE 2-6: AIRCRAFT APRONS - EASTERN OREGON REGIONAL AIRPORT

Terminal Apron	25,090 square yards (Asphalt, with 1,200 square yard PCC section)
General Aviation Apron	76,912 square yards (PCC) 24,688 square yards (Asphalt) 24 airplane tiedowns (Asphalt Section)
East Agricultural Apron	7,152 square yards (Asphalt, with three 200 square yard PCC loading pads)

Terminal Apron

The terminal apron is located directly in front of the terminal building and air traffic control tower. The apron accommodates aircraft loading/unloading of commercial traffic. The apron is designed to accommodate heavy aircraft, which allows use by large commercial aircraft. The apron includes a Portland Cement Concrete (PCC) section immediately in front of the terminal (for heavy aircraft parking) and asphalt sections abutting the central section of the main apron and Runway 11/29. The apron section abutting Runway 11/29 and Taxiway D is marked with surface painted holding position markings (denoting runway numbers) and a painted aircraft hold line.

General Aviation Apron

The general aviation apron has two primary operating areas: the aircraft tiedown area located at the west end of the apron and the center section of apron that accommodates a variety of uses.

The center section of the apron accommodates aircraft fueling, fixed base operator (FBO) activities, air cargo/express aircraft loading/unloading, and helicopter parking. The apron also provides access to several hangars, the airport fire station, and airport maintenance facilities. This section of apron is original Portland Cement Concrete (PCC) constructed in 1942.

The west airplane tiedown apron area is configured with six north-south rows of west-facing tiedowns served by five adjacent taxilanes that connect to an east-west taxilane on the north edge of the apron. The apron has twenty-two (22) small airplane tiedowns and two (2) large airplane tiedowns, which are located at the south end two tiedown rows and may be accessed directly from the center section of the main apron. The north-south apron taxilanes are designed to accommodate small aircraft (Airplane Design Group I). The west tiedown apron was reconstructed in 1999.

Agricultural Operations Apron

The agricultural operations apron, located adjacent to Taxiway G (east), is configured with three PCC loading stations that are hard piped to an open containment area located adjacent to Taxiway F. The apron has taxilane connections to Taxiway G at the north and south ends of the apron.

The area adjacent to the apron is currently being used to accommodate UAS ground facilities. Several locally based aerial applicators maintain hangars and facilities adjacent to the main apron.

Airport Lighting and Signage

Eastern Oregon Regional Airport accommodates day and night operations in both visual and instrument meteorological conditions (IMC). The runways are equipped with lighting systems that are consistent with current instrument approach requirements and runway use. Most of the major taxiways on the Airport are equipped with edge lighting. **Table 2-7** summarizes the categories of airport lighting currently used at the airport. All airfield lighting observed during recent site visits appeared to be in good condition and fully operational.

The runway-taxiway system has extensive lighted signage that conveys directional, location, and runway clearance information to pilots.

TABLE 2-7: TYPES OF AIRPORT LIGHTING AT EASTERN OREGON REGIONAL AIRPORT

CATEGORY	TYPE	CONDITION
Airport Lighting	Airport Rotating Beacon (white/green dual lens) Lighted Wind Cones (3)	Good
Approach Lighting	Rwy 25 - Medium Intensity Approach Lighting System (MALS) with Runway Alignment Indicator Lights (RAIL) [MALS-R] Rwy 7 - Omni Directional Approach Lighting System (ODALS)	Good
Runway Lighting	Rwy 7/25 - High Intensity Runway Lighting (HIRL) (white/amber lenses); Threshold Lighting (red/green lenses) Rwy 11/29 – Medium Intensity Runway Lighting (MIRL) (white/amber lenses); Threshold Lighting (red/green lenses) Rwy 11 & 29 - Runway End Identifier Lights (REIL) (white strobes)	Good Note: REIL out of service
Visual Guidance Indicators	4-Light PAPI (red/white lenses) • Rwy 25: (P4L) 3 degree glide path • Rwy 11: (P4L) 3 degree glide path • Rwy 29: (P4L) 3 degree glide path 4-Light VASI (red/white lenses) • Rwy 7: (V4R) 3 degree glide path	Good
Taxiway Lighting	Medium Intensity Taxiway Lighting (blue) on Taxiway A, B and F	Good
Airfield Signage	Mandatory, Location, Directional, and Destination Signs Distance Remaining Signs	Good
Other Lighting	Obstruction lights, lighted wind cones (2), lighted segmented circle and wind T, lighted airport signage; flood lighting in hangar, fuel areas.	Good

Airport Lighting

The airport rotating beacon is mounted on a tower support adjacent to the large hangar currently leased by the Experimental Aircraft Association (EAA). Rotating beacons are used to indicate the location of an airport to pilots at night or during reduced visibility. The beacon provides sequenced white and green flashing lights (representing a lighted land airport) that rotate 360 degrees to allow pilots to identify the airport from all directions from several miles.

Three lighted wind cones are located on the airfield: one wind cone is located in the segmented circle in the center of the airport; one is located between the two runways, west of the runway intersection; and one is located between Runway 7/25 and Taxiway F.

The rotating beacon and lighted wind cones operate on a dusk-dawn automatic switch. The runway lighting, approach lighting, visual guidance indicators, and taxiway lighting are controlled by the air traffic control tower during hours of operation and pilot-activated using the common traffic advisory frequency (CTAF) 122.9 MHz during hours the tower is closed. All airfield lighting reportedly functions normally.

Approach Lighting

- **Runway 7**: Runway 7 is equipped with an omnidirectional approach lighting system (ODALS). The ODALS is a series of individual medium-intensity approach lights installed on the extended runway centerline, leading pilots to the runway end.

- **Runway 25**: Runway 25 is equipped with a medium intensity approach lighting system (MALS) with runway alignment indicator lights (RAIL). The MALS-R is the standard approach lighting system for runways with Category I Instrument Landing Systems. Approach lighting assists pilots to visually identify the runway environment and align the aircraft with the runway in the final approach segment. The MALS-R is 2,400 feet long, installed beyond the runway end along the extended centerline of the runway, and consists of light bars, sequenced flashing lights (RAIL), and a threshold bar. The MALS-R is FAA-owned and maintained.

- **Runway 11**: Runway 11 is not equipped with an approach lighting system.

- **Runway 29**: Runway 29 is not equipped with an approach lighting system.

Runway Lighting

Runway 7/25 has high intensity runway edge lighting (HIRL) and Runway 11/29 has medium intensity runway edge lighting (MIRL). All runway ends are equipped with visual guidance indicators. Both ends of Runway 11/29 are equipped with runway end identifier lights (REIL), although airport management reports that the REILs are out of service and require replacement.

- **HIRL/MIRL:** The HIRL or MIRL systems include white edge lights (with amber lights located near the runway ends to indicate runway remaining) and runway threshold lights. The threshold lights consist of two sets of four fixtures near each corner of the runway ends. The fixtures have split lenses (green/red) indicating the beginning and end of the runway.
- **REIL:** Runway end identifier lights (REIL) consist of two high-intensity sequenced strobe lights that mark the approach end of the runway to assist pilots in establishing visual contact with the runway environment during periods of darkness or reduced visibility.
- **Visual Guidance Indicators**: Precision approach path indicators (PAPI) project light along a standard glide path to a runway end, with red and white colored lights indicating the aircraft's vertical position (above, below, or on glide path) relative to the defined glide path. Visual approach slope indicator (VASI) projects a beam of light having a white segment in the upper part of the beam and red segment in the lower part of the beam.

Taxiway Lighting

The major taxiways at Eastern Oregon Regional Airport are equipped with blue medium intensity taxiway edge lighting (MITL). Other taxiways have stake-mounted blue reflective markers.

Airfield Signage

The runway-taxiway system has internally illuminated mandatory instruction signs (red background with white letters/numbers) at the aircraft holding positions for each taxiway connection with the runway [7, 25, 11, 29 etc.]. The signs also include taxiway direction/designations [A, B, D, MIL, → etc.] with yellow background and black numbers/letters. The signs are located to coincide with the painted aircraft hold lines on each taxiway that connects to the runway.

Other Lighting

Overhead lighting is available in the terminal area and main aircraft parking aprons, the aircraft fueling area, and in various hangar areas. Hangars also have exterior wall-mounted floodlights. Red obstruction lights are mounted on the top of several structures or built items (antennas, windsocks, etc.) on the airfield.

Airfield Pavement Condition

Pavement Management Reports are periodically updated to assist airports in the ongoing maintenance of airfield pavements. The Airport Pavement Management System (APMS) is designed to assess the relative condition of the airport pavement sections and to identify pavement system needs, make programming decisions for funding, provide information for legislative decision making, and assist local jurisdictions with planning decisions.

Airfield pavements are assessed using the Pavement Condition Index (PCI). The PCI inspection quantifies the types, severities, and amounts of distress observed in the pavements through a visual inspection. The evaluation is quantified using a scale from 0 (failed) to 100 (good) with ratings applied to individual pavement sections, providing an overall condition report for the airport. The condition is an indication of the needs for maintenance and/or repair that will be required over a seven-year period.

The most recent pavement report available for Eastern Oregon Regional Airport is based on a July 2014 inspection.[6] **Table 2-8** summarizes airfield pavement conditions for Eastern Oregon Regional Airport based on the inspection and the predicted conditions in 2019 and 2024, assuming no maintenance is performed.

[6] 2014 Pavement Evaluation/Maintenance Management Program (Pavement Consultants Inc., November 2014)

TABLE 2-8: SUMMARY OF AIRFIELD PAVEMENT CONDITION - EASTERN OREGON REGIONAL AIRPORT

PAVEMENT[2]	SECTION DESIGN/AGE	2014 PCI RATING1	2019 FORECAST PCI[1]	2024 FORECAST PCI[1]
Runway 7/25	3” AC (2005); 2-3” AC (unk.); 4” AC (unk.); 6” Cr. Agg. Base (unk.)	54	51	48
Runway 11/29	2” AC (unk.); 2-3” AC (1999); 8” Base (unk.)	69	58	53
Taxiway A	AC (unk.); Base (unk.)	63	50	49
Taxiway B (north section)	4” AC (2005); 5” Cr. Agg. Base (2005); 7” CTB Base (2005)	42	40	38
Taxiway B (south of Taxiway A)	1” AC (unk.); 2.5” AC (unk.); 2” AC (unk.); 8” Cr. Agg. Base (unk.)	42	40	38
Taxiway D	4” AC (2002); 5” Cr. Agg. Base (2002); 7” CTB Base (2002)	67	53	45
Taxiway E	2.5” AC (2000.); 2.5” AC (unk.); 2” AC (unk.); 6” Cr. Agg. Base (unk.)	48	45	44
Taxiway F	AC (unk.); Base (unk.);	65	52	46
Taxiway G	South Section: 4.5” AC (2002); 2.5” AC (unk.); 2” AC (unk.); 5” Cr. Agg. Base (unk.). North Section: 2.5” AC (1978); 6” Base (1978)	43	36	32
East Ag. Apron	2” AC (1980); 6” Base (1980)	18	13	9
Terminal Apron	4” AC (2002); 2” AC (unk.); 8” Cr. Agg. Base (unk.)	54	51	51
Terminal Apron –PCC	13” PCC (2002); 9” Subbase (2002)	50	46	42
GA Apron (Ctr Sec.)	6” PCC (1942)	78	67	65
AC Tiedown Apron	2.5” AC (1998); 2” AC (unk.); 6” Cr. Agg. Base (unk.)	79	67	65
T-Hangar Taxilane (north row)	2.5” AC (1980); 2” AC (unk.); 6” Cr. Agg. Base (unk.)	50	28	3
T-Hangar Taxilane (center row)	2.5” AC (1980); 2” AC (unk.); 6” Cr. Agg. Base (unk.);	36	11	0
T-Hangar Taxilane (south row)	AC (unk.); Base (unk.)	39	14	0

AC = Asphaltic Concrete (Asphalt); PCC = Portland Cement Concrete; CTB = Concrete Treated Base
Base/Cr. Agg. Base = Rock/Crushed Aggregate Section Under Pavement; Unk. = Unknown

1. The Pavement Condition Index (PCI) scale ranges from 0 to 100, with seven general condition categories ranging from “failed” to “excellent.” For additional details, see Eastern Oregon Regional Airport Pavement Management Report.
2. The runways, taxiways, and aprons may include multiple pavement sections with varying PCI values, pavement design, and age. The average PCI has been taken for pavements with multiple sections and the best available pavement design is listed. For additional details, see Eastern Oregon Regional Airport Pavement Management Report.

Ideally, a combination of visual inspection and technical engineering analysis is used to provide precise assessments of pavement condition and optimal timing for rehabilitation. The condition of the airfield pavements observed during site visits performed as part of the master plan update (Winter 2014-15) are generally consistent with the most recent pavement evaluations. Based on their current condition, pavement rehabilitation or reconstruction projects will be required for Runway 7/25, several taxiways, apron sections, and hangar taxilanes within the current 20-year planning period. Ongoing pavement maintenance will also be required for all airfield pavements.

Landside Facilities

Hangars and Airport Buildings

Eastern Oregon Regional Airport accommodates a variety of aviation-related buildings including aircraft storage hangars, commercial and mixed-use hangars, and a commercial aviation terminal. The south side of the airport currently accommodates all landside facilities and based aircraft. The airport also includes the Pendleton Business and Industrial Park on the south side of NW "A" Avenue/Airport Road that includes numerous non-aeronautical and non-aviation buildings. **Figure 2-3**, presented earlier in this chapter, depicts the existing buildings on the airport. **Table 2-9** summarizes existing aviation use buildings located at the airport.

TABLE 2-9: EASTERN OREGON REGIONAL AIRPORT ON-AIRPORT BUILDING LIST

BLDG. #[1]	BUILDING	USE	OWNER/TENANT
-	Terminal Building	City Airport Administration Office, Air Traffic Control Tower, Airline Offices, Ticket Counter, Passenger Waiting Room, Public Restrooms	City
-	Large "EAA" Hangar	Aircraft Storage	City/EAA
-	Airfield Maintenance and Equipment Building	Snow Removal Equipment, Airfield Mowers, and Airport Vehicles Storage	City
-	Airport Fire Station Building	ARFF Vehicles/Equipment Storage	City
6	Commercial Building (adjacent to City T-Hangar)	Offices	Styer
4	Commercial Building (adjacent to EAA bldg.)	Offices	Rod Anderson Construction
-	T-Hangar/Conventional Hangar	Aircraft Storage and Commercial Use	City
7	FBO Building	Offices	Haggland
8	Land	Undeveloped	Hoeft
9	Commercial Hangar	Aircraft Storage	Wahl
10	Commercial Hangar	Aircraft Storage	Nelson
11	Commercial Hangar	Aircraft Storage	General Air Service

12	Conventional Hangar	Aircraft Storage	Midco
13	Conventional Hangar	Aircraft Storage	Hart
14	Conventional Hangar	Aircraft Storage	Stratton
15	T-Hangar (11-Unit)	Aircraft Storage	City
16	T-Hangar (11-Unit)	Aircraft Storage	City
-	ORARNG Hangar and Support Buildings	Helicopter and UAS Flight Operations	ORARNG
-	National Weather Service (NWS)	Operations	NWS
[1]Airport building number as listed on City Tenant List			

Airport Terminal Building

The main terminal building is a two-story structure constructed in 1953 and remodeled in 1996. The building houses the City of Pendleton Airport Administration office, Air Traffic Control Tower, airline ticket counters and offices, concession counters, passenger waiting area, baggage area, public restrooms, a restaurant and additional leased office space.

General Aviation Hangar Area

The airport's primary hangar area is located adjacent to the main apron, west of the airport terminal. The area currently accommodates the large "EAA" hangar, 6 commercial or mixed-use hangars, 3 multi-unit T-hangars, and 3 conventional storage hangars. Life Flight Network recently constructed a commercial hangar adjacent to the northwest corner of the main apron for its aircraft. A new city constructed "plex" hangar was also constructed in this area in 2016.

The airport fire station and maintenance shop are located just west of the EAA hangar on the main apron.

Army National Guard Area

The Army National Guard Armory and Aviation Support Facility are located on the west side of the airport. This area includes one large conventional hangar, aircraft fueling pad, helicopter parking apron, and mixed-use buildings. Surface access to the ORARNG facility is provided via NW 56th Drive, which connects to Airport Road, west of the terminal area.

Unmanned Aerial Systems (UAS)

The Pendleton UAS Range (PUR) is a component of the Pan Pacific UAS Test Range Complex (PPUTRC), led by the University of Alaska. The PPUTRC is one of six official Federal Aviation Administration's (FAA)

UAS Test Sites in the United States. The Pendleton UAS Range received initial operating approval on September 30, 2014 and is currently focused on UAS business development. Eastern Oregon Regional Airport is the designated test site airport located in the PUR and is the focus of new business activity and flight testing.

The initial development of UAS facilities at the Airport involved the City of Pendleton constructing 15 UAS operation pads east of Taxiway Golf and south of Taxiway Foxtrot. The 50' x 50' compacted gravel pads are equipped with potable water, electric and fiber internet access. The Oregon Army National Guard and private contractors currently use the pads to support their UAS operations. The ORARNG uses a catapult launcher located southeast of the Taxiway Golf and Foxtrot intersection, and typically recovers the UAS on Taxiway Foxtrot. The use of Taxiway F for UAS recovery requires the taxiway to be temporarily closed by NOTAM.

The FAA is anticipating commercialization of civil and commercial UAS, mainly through FAA Type Certification of the aircraft and systems. However, the development of UAS type certification standards, criteria and approvals is expected to be a lengthy process. During this period, the FAA will encourage use of FAA-approved test sites as a safe, controlled environment to perform research & development, crew training, and market survey (i.e. customer demonstrations and training). The FAA views the test sites as a critical element for the future of the UAS industry. Once UAS type certification standards and criteria are defined by the FAA, the test sites will continue to provide an optimal environment for UAS flight testing, much in the same way that manned aviation companies currently use a network of test sites and civil airfield for their flight testing.

The evaluation of UAS facility needs and operational issues as an element of the Eastern Oregon Regional Airport Master Plan represents the first known FAA-funded airport master plan in Oregon or the Northwest region to integrate UAS into conventional airport planning. The primary goal is to include UAS as one of several recognized aviation users of the Airport and to plan facilities accordingly to provide the highest level of safety. A full description of UAS activities and facilities is provided in Chapter 4 and is reflected in the airport development alternatives analysis.

Vehicle Access and Parking

Surface access to Eastern Oregon Regional Airport is provided by Airport Road, which loops from Exit 202 to Exit 207 on U.S. Interstate 84. The airport is located approximately 1 mile north of Interstate 84 and provides access to the airport terminal and passenger parking lot, tenant hangars, Army National Guard and Armory, Airport Industrial Park, and the City of Pendleton Police station.

The terminal parking lot has 176 paved and striped parking spaces, including 4 disabled parking spaces, immediately adjacent to the terminal for employee and customer parking. An additional 18 rental car parking spaces are located just west of the terminal parking lot. Additional vehicle parking is available adjacent to individual hangars and airport businesses.

Airspace and Navigational Aids

Airspace Classifications

Airspace within the United States is classified by the FAA as "controlled" or "uncontrolled" with altitudes extending from the surface upward to 60,000 feet above mean sea level (MSL). Controlled airspace classifications include Class A, B, C, D, and E. Class G airspace is uncontrolled.

Aircraft operating within controlled airspace are subject to varying levels of positive air traffic control that are unique to each airspace classification. Requirements to operate within controlled airspace vary, with the most stringent requirements associated with very large commercial airports in high traffic areas. Uncontrolled airspace is typically found in remote areas or is limited to a 700 or 1,200-foot AGL layer above the surface and below controlled airspace. **Figure 2-4** illustrates and describes the characteristics of the airspace classifications defined by the FAA.

Local Area Airspace Structure

Figure 2-5 depicts nearby airports, notable obstructions, special airspace designations and instrument flight rules (IFR) routes in the vicinity of Eastern Oregon Regional Airport, as identified on the Seattle Sectional Chart and the IFR Enroute Low Altitude Chart (L-1/L-2).

Eastern Oregon Regional Airport is located in an area of Class D airspace that is in effect when the air traffic control tower is in operation (0600 to 2000 local). The Class D airspace extends from the surface upward to 4,000 feet above airport elevation, with a 5-mile radius surrounding the airport. Two-way radio communication is required to operate in Class D airspace during visual flight rules (VFR) conditions and an air traffic control (ATC) clearance is required during instrument flight rules (IFR) conditions.

When the control tower is closed (2000 to 0600 local), the airspace reverts to Class E airspace that begins at 700 feet above ground and extends upward to 18,000 feet above mean sea level (MSL). The local Class E airspace consists of a 10-nautical mile radius surrounding the airport with west and east rectangular sections that extend approximately 20 nautical miles overall. Radio communication is not required for VFR operations in Class E airspace, although pilots are encouraged to use the common traffic advisory frequency (CTAF) when operating at the airport. Aircraft are required to obtain an ATC clearance prior to operating in Class E airspace during IFR conditions.

Several Low Altitude Enroute Instrument Airways connect to the nearby Pendleton VORTAC[7], located 4 nautical miles west of the Airport:

- Victor 4 (V4) northwest to Yakima VORTAC and southeast to Baker City VOR/DME;
- Victor 298 (V298) north to Tri-Cities (Pasco VOR/DME) and southeast to McCall (Donnelly VOR/DME);
- Victor 536 (V536) northeast to Walla Walla VOR/DME and southwest to Redmond (Deschutes VORTAC); and
- Victor 112 (V112) west to The Dalles (Klickitat VOR/DME) and northeast to Spokane VORTAC.

The instrument airways are designed to provide defined paths (fixed courses and minimum altitudes) for enroute aircraft that are clear of terrain and other potential hazards for aircraft operating without the benefit of visual contact. Aircraft transition between enroute and terminal airspace through the use of defined instrument approach and departure procedures.

The minimum enroute altitudes for the nearby instrument airways are well above the local airport traffic pattern altitude and do not conflict with VFR airport operations. The local fixed-wing traffic pattern altitude at Eastern Oregon Regional Airport is 1,000 feet above ground level (AGL) (approximately 2,500' MSL) with standard left traffic unless otherwise assigned by the air traffic control tower (ATCT). The traffic patterns for Runway 7/25 and Runway 11/29 are depicted in **Figure 2-6.**

[7] VORTAC = Very High Frequency Omni Directional Radio Range (VOR), with Tactical Air Navigation (TACAN).

Special Use Airspace

The nearest Military Operations Areas (MOA) is the Boardman MOA (25 NM west). MOAs are designated to segregate VFR and IFR traffic from military operations. When a MOA is active, IFR traffic may be cleared through the area when air traffic control can ensure IFR separation; otherwise, traffic will be rerouted. Although VFR operations are not restricted in a MOA, pilots are advised to exercise extreme caution while flying within, near, or below an active MOA. Prior to entering an active MOA, pilots are encouraged to contact the controlling agency for traffic advisories due to the frequently changing status of these areas.

Within the Boardman MOA, there is an area of Restricted Airspace (R-5701). Restricted areas are areas where operations are hazardous to nonparticipating aircrafts. These hazards may include artillery firing, aerial gunnery, or guided missiles. Aircrafts operating on an IFR flight plan may be authorized to transition through the restricted area during periods the restricted area is not active.

Figure 2-4: Airspace Classifications

Figure 2-5: Local Airspace

Figure 2-6: Airport Traffic Patterns

Navigational Aids and Weather

Ground based navigational aids located on Eastern Oregon Regional Airport include the localizer and glide slope components of the instrument landing system (ILS). The localizer (LOC) transmits a high frequency electronic signal (110.3 MHz) that provides runway centerline (inbound course) guidance to aircraft. The localizer transmitter is located beyond the far end of the ILS runway (approximately 1,000 feet west of the end of Runway 7). The glide slope transmits an electronic signal that provides a defined glide path to the runway end. The glide slope transmitter is located on the north side of the runway, approximately 1,000 feet west of the end of Runway 25. Both the localizer and glide have FAA-defined critical areas to protect signal integrity. The glide slope and localizer are FAA-owned and maintained.

The Pendleton VORTAC[8] is located off the airport, approximately four miles west, near the Airport Road connection to Interstate 84 Exit 202. The VORTAC supports an instrument approach to Runway 7 and the missed approach procedure for the ILS and localizer approaches on Runway 25, in addition to its enroute air navigation function. The VORTAC is FAA-owned and maintained.

Eastern Oregon Regional Airport has an on-site automated surface observing system (ASOS) that provides 24-hour weather information. The ASOS is located north of Runway 7/25, east of Taxiway G. The ASOS provides altimeter setting, wind data, density altitude, visibility, cloud/ceiling data, temperature, dewpoint, icing, lightning, sea level pressure, and precipitation. The ASOS is owned and maintained by the National Weather Service (NWS).

Pendleton has a hazardous inflight weather advisory service (HIWAS), which is a continuous broadcast of hazardous weather information transmitted through the VORTAC. This includes Airmen's Meteorological Information (AIRMETs), significant meteorological information (SIGMETs), convective SIGMETs, and urgent pilot reports (PIREPs).

Instrument Procedures

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

[8] Very high frequency Omnidirectional Radio range (VOR) combined with UHF frequencies (Tactical Air Navigation – TACAN)

segments. The aircraft approach speed and corresponding descent rate may also affect approach minimums for different types of aircraft.

Eastern Oregon Regional Airport currently has six published instrument approaches, including a precision Instrument Landing System (ILS) approach to Runway 25. When coupled with an approach lighting system, an ILS provides the best approach capabilities typically found at general aviation airports. The Runway 25 ILS approach provides electronic vertical (descent) and horizontal (course) guidance to the runway end that allows aircraft to descend as low as 200 feet above the ground before visually recognizing the runway environment. The Runway 25 approach is also authorized as a non-precision procedure (course only) when using the localizer without the glideslope.

The airport has four global positioning system (GPS) procedures and one VOR procedure that are classified as non-precision. The four RNAV (GPS) approaches provide vertical guidance to the runway end for aircraft equipped with the appropriate FAA-certified GPS receiver; the other approaches provide electronic course guidance only. All of the instrument approaches are authorized for category A-D aircraft, with varying approach minimums for both straight-in and circling procedures.

The existing instrument approach capabilities for Eastern Oregon Regional Airport are summarized in **Table 2-10.** The instrument approach procedure charts are included in the report appendix.

TABLE 2-10: INSTRUMENT PROCEDURES - EASTERN OREGON REGIONAL AIRPORT

APPROACH	APPROACH CATEGORY A		APPROACH CATEGORY B		APPROACH CATEGORY C		APPROACH CATEGORY D	
	Ceiling	Vis.	Ceiling	Vis.	Ceiling	Vis.	Ceiling	Vis.
ILS LOC RWY 25								
Straight-In ILS	200	.5	200	.5	200	.5	200	.5
Straight-In LOC	373	.5	373	.5	373	.75	373	.75
Circling	423	1	423	1	423	1.5	703	2.25
RNAV/GPS RWY 7								
LPV DA	250	.75	250	.75	250	.75	250	.75
LNAV/VNAV DA	348	1.25	348	1.25	348	1.25	348	1.25
LNAV MDA	394	.75	394	.75	394	.75	394	1.25
Circling	423	1	463	1	463	1.5	563	2
RNAV/GPS RWY 25								
LPV DA	200	.5	200	.5	200	.5	200	.5
LNAV/VNAV DA	313	.5	313	.5	313	.5	313	.75
LNAV MDA	373	.5	373	.5	373	.5	373	1
Circling	423	1	463	1	463	1.5	563	2
VOR RWY 7								
Straight-In	554	.75	554	.75	554	1.5	554	1.75
Circling	543	1	543	1	543	1.5	563	2
RNAV/GPS RWY 29								
LPV DA	250	1	250	1	250	1	250	1
LNAV/VNAV DA	304	1	304	1	304	1	304	1
LNAV MDA	363	1	363	1	363	1	363	1.25
Circling	423	1	463	1	463	1.5	563	2
RNAV/GPS RWY 11								
LPV DA	250	1	250	1	250	1	250	1
LNAV/VNAV DA	363	1.25	363	1.25	363	1.25	363	1.25
LNAV MDA	373	1	373	1	373	1	373	1.25
Circling	423	1	463	1	463	1.5	563	2

Approach Categories are based on the approach speed of an aircraft in the landing configuration (typically 1.3 times the stall speed Vso). Approach Categories:
Category A: *0-90 knots (Cessna 172, Beechcraft Bonanza, Piper Seneca)*
Category B: *91-120 knots (Beechcraft King Air, Cessna Citation, deHavilland Q400)*
Category C: *121-140 knots (Learjet 45, Canadair Challenger, Boeing 737, MD80)*
Category D: *141-165 knots (Gulfstream 550)*
Ceiling: Lowest permitted height of clouds in feet above ground level (AGL)
Vis: Minimum visibility required in statute miles
Source: National Ocean Service Instrument Approach Plates (11 Dec 2014 to 08 Jan 2015)

Airport Support Facilities/Services

Aircraft Fuel

Eastern Oregon Regional Airport has 100-octane low lead (100LL) aviation gasoline (AVGAS) and jet fuel (Jet-A) available for sale through the local fixed base operator (FBO), Pendleton Aviation. Several airport tenants have private fuel storage tanks for their use. **Table 2-11** summarizes existing aviation fueling facilities on the airport.

Fixed Base Operators (FBO)

Pendleton Aviation is the fixed base operator (FBO) at Eastern Oregon Regional Airport, providing aircraft fuel sales, charter, pilot lounge, vending machines, restrooms, and aircraft deicing (Type-1). The FBO has two (Type-1) deice mobile trailers, a 100-gallon tank and 300-gallon tank.

Public Restrooms

Public, ADA-accessible restrooms are located in the airport terminal building. Several individual hangars and businesses have private restroom facilities.

Fencing

Eastern Oregon Regional Airport has an extensive fencing and gate system that covers the entire operations area of the airfield. A 6-foot three-strand barbwire fence extends from the agriculture pad gate, around the terminal extending south and west then north until it connects to the Oregon Army National Guard fence. The remainder of the fencings consists of four-strand barbwire fencing.[9]

[9] Eastern Oregon Regional Airport, Airport Certification Manual, Section 335-Public Protection (Updated November 1, 2014)

TABLE 2-11: AVIATION FUEL STORAGE - EASTERN OREGON REGIONAL AIRPORT

STORAGE TYPE	LOCATION/FACILITIES
Fixed Point Fuel Tanks and Dispensing Facilities	FBO Owned (1) 1,000 gallon self-serve above-ground storage tank (100LL) – *On Airport* (1) 8,000 gallon underground storage tank (Jet-A) – *Airport Industrial Park* (1) 10,000 gallon underground storage tank (Jet-A) – *Airport Industrial Park* (1) 10,000 gallon underground storage tank (100LL) – *Airport Industrial Park* Tenant Owned (1) 10,000 gallon underground fuel tank (100LL) – *On Airport* (1) 12,000 gallon underground fuel tank (Jet-A) – *On Airport*
Mobile Fuel Trucks and Portable Tanks	FBO Owned (1) 4,000 gallon tank mobile truck (Jet-A) (2) 1,200 gallon tank mobile trucks (Jet-A) (1) 1,200 gallon tank mobile truck (100LL) Tenant Owned (1) 1,200 gallon tank mobile trailer (1) 200 gallon tank portable (Jet-A) (1) 150 gallon tank portable (100LL) Tenant Owned (1) 4,000 gallon tank mobile (Jet-A) (2) 5,000 gallon tanks mobile (Jet-A) (1) 4,000 gallon tank mobile (100LL) (1) 1,800 gallon tank mobile (100LL) Tenant Owned (1) 50 gallon tank portable (100LL)

Airport Equipment List

Eastern Oregon Regional Airport maintains several vehicles for airport maintenance and snow removal:

Snow Removal Equipment

- 2001 International 7400/DT466 Snow Plow Trucks
- 2002 Ford F-550 Truck with Multi-Position V Plow

Airfield Equipment

- 1994 Chevy Truck
- 1980 (estimated) Ford A-64 Front End Loader
- 1984 Kubota 1720 L355SS Tractor with rear mounted rake
- Ford 7710 CabTractor
- 2016 Toro ProForce Blower/Tow Behind
- 2013 Ground leveler water fillable drum wrapped in 13 Tires (pulls behind Tractor)

Public Protection

City of Pendleton Police

Eastern Oregon Regional Airport is located within the Pendleton city limits and local law enforcement is provided by the Pendleton Police Department, with additional support provided by the Umatilla County Sheriff and Oregon State Police (OSP) as needed. The City of Pendleton Police Station is located approximately 1 mile south of the Airport on Airport Road.

Aircraft Rescue and Firefighting (ARFF)

The City of Pendleton Fire Department provides Aircraft Rescue and Firefighting services at the airport. Eastern Oregon Regional Airport maintains equipment and capabilities for Index A operations, and maintains the ability to meet Index B level upon request. Index B requires ARFF equipment and personnel to be positioned at the airport 15 minutes before and after an air carrier takeoff and landing. All air carrier operations require prior permission and coordination from the Airport Manager prior to operating at the airport to ensure proper ARFF availability. Below is a list of the airport's equipment and firefighting agents:[10]

2012 Oshkosh Aircraft Crash Rescue Truck Model T-1500

Agents:

-1,500 gallons of water/210 gallons of 6% aqueous film forming foam (AFFF)
-450 pounds of Purple-K dry chemical powder

[10] Eastern Oregon Regional Airport, Airport Certification Manual, Section 317-Aircraft Rescue & Firefighting (Updated November 1, 2014)

1998 Oshkosh Aircraft Crash Rescue Truck Model T-1500

Agents:

-1,500 gallons of water/210 gallons of 6% aqueous film forming foam (AFFF)
-450 pounds of Purple-K dry chemical powder

Utilities

The developed areas of Eastern Oregon Regional Airport have water, natural gas, sanitary sewer, electrical, and telephone/internet service and fiber optical cable.

Water

The City of Pendleton provides water service to the Airport. Two large city water storage tanks are located adjacent to the terminal parking lot.

Sanitary

The City of Pendleton provides sanitary sewer service to the Airport.

Power

Pacific Power provides electrical service for the Airport. Electrical lines extend along Airport Road/NW "A" Avenue, south of the airfield and supply power to airport hangars, businesses, and the Airport Industrial Park. Overhead electrical lines located on the west side of NW 56th Drive supply power to the Oregon Army National Guard and other buildings. Electrical lines follow a service road around the approach end of Runway 25 to supply power to the glideslope and weather station.

Gas

Cascade Natural Gas provides natural gas to the Airport by underground gas pipelines that connect to the terminal, several hangars and businesses, and to the Airport Industrial Park.

Telephone/Internet

Charter Communications and CenturyLink with Techlink provide telephone and high-speed internet service to the airport area.

Land Use Planning and Zoning

The City of Pendleton has land use authority for Eastern Oregon Regional Airport and its immediate surroundings. The City of Pendleton's Unified Development Code provides the established "standards for development within the City of Pendleton and its Urban Growth Boundary, and to implement the Pendleton Comprehensive Plan." A detailed description of current zoning, airport overlay zoning, and land use is presented later in the master plan.

Zoning

The airport is zoned **Airport Activities Zone (A-A).** The Airport Activities Zone's purpose is to "protect the lands lying adjacent to the airport runway and terminal areas from incompatible development, while providing lands for airport-related and agricultural uses."[11] The A-A Zone contains the permitted uses, conditional uses, and development standards on City-owned property.

Airport Vicinity Zoning

The zoning around the airport is a mix of **Light Industrial (M-1), Exclusive Farm Use (EFU), and Airport Activities (A-A)**. East and northwest of the airport are areas EFU zoning—both in the city limits and in adjacent unincorporated Umatilla County. The purpose of the City EFU Zone is "to preserve and maintain agricultural lands for farm use, including range and grazing uses, consistent with existing and future needs for agricultural products, and open spaces." Areas south and west of the airport are zoned M-1. The purpose of M-1 zoning is "to provide, enhance, and protect areas to accommodate a wide range of manufacturing and allied uses that need generally flat topography and easy access to arterials and intermodal shipping facilities, and to reserve industrial sites near the airport for specific employment uses identified in the Pendleton Economic Opportunities Analysis (EOA)."

Airport Overlay Zoning

The City of Pendleton created two airport overlay zones identified as Subdistricts. The **Airport Hazard Subdistrict (AHZ)** established a set of "Airport Zones" including the approach zones, transitional zones, horizontal zones, and conical zones. The city code states "These zones are adopted as part of the City's Airport Master Plan and made a part of this Ordinance (3845) by reference." The Airport Hazard Subdistrict includes height restrictions for each of the Airport Zones, use restrictions, nonconforming uses,

[11] Ordinance 3845, City of Pendleton Unified Development Code (12/2/2014)

and permits. The **Airport Industrial Subdistrict (AI)** "reserved designated Light Industrial (M1) sites near the Airport for targeted industrial users as called for in the Pendleton Comprehensive Plan (Industrial Plan Table A-AI) and the Pendleton Economic Opportunities Analysis (EOA)."

Airport Industrial Park (AIP)

The Airport Industrial Park is located within airport property and consists of approximately 435 acres. The industrial park is fully serviced with utilities and offers convenient and redundant access to Interstate 84. A list of recent industrial park tenants is provided in **Table 2-12**.

TABLE 2-12: AIRPORT INDUSTRIAL PARK TENANTS

- Round Up Radio
- NOAA Weather Station
- Community Bank
- Rod Anderson Construction
- Drake's RV
- Hill Meat Company
- Barhute Specialty Foods
- Cellular One
- US Cellular/Verizon
- Yamaha Motor Corp.
- Digital Harvest
- The Furniture Lady & Airport Antiques
- McCormack Construction, Inc.
- Loftis/Baarstad
- Airport Mini Storage
- A-Sharp Painters
- Western Auto
- Pace Wood Products
- M & J Pallet
- Main Street Cowboys
- Pendleton Police Department
- BMCC/Archery
- NexGen UAS Range Management, LLC
- David Lloyd
- Old West Design Builders
- Severe Bros. Saddlery
- Schubert Diesel
- Capeco
- Thews Sheet Metal

Data Sources:

- City of Pendleton airport records, airport and municipal drawings
- Eastern Oregon Regional Airport – Airport Master Plan (David Evans and Associates, October 2002)
- Airfield Design Drawings and Engineering Reports (various projects) (Precision Approach Engineering)
- 2014 Pavement Evaluation/Maintenance Management Program (Pavement Consultants Inc., November 2014)
- FAA Airport Master Record Form (5010-1)
- Airport/Facility Directory (AFD) –Northwest U.S. (U.S. DOT, Federal Aviation Administration, National Aeronautical Charting Office)
- Seattle Sectional Aeronautical Chart; IFR Enroute Low Altitude (L-1/L-2) Chart (U.S. DOT, Federal Aviation Administration, National Aeronautical Charting Office)
- Instrument Approach Procedure Charts (FAA NACO)
- City of Pendleton Zoning Ordinance and Mapping
- City of Pendleton Comprehensive Plan
- Umatilla County Zoning Ordinance and Mapping
- Umatilla County Comprehensive Plan
- Local land use planning documents and mapping
- Local and regional socioeconomic data

Chapter 3 – Aviation Activity Forecasts

Chapter 3 – Aviation Activity Forecasts

The overall goal of aviation activity forecasting is to prepare forecasts that accurately reflect current conditions, relevant historical trends, and provide reasonable projections of future activity, which can be translated into specific airport facility needs anticipated during the next twenty years and beyond.

Introduction

This chapter provides updated forecasts of aviation activity for Eastern Oregon Regional Airport (PDT) for the twenty-year master plan horizon (2015-2035). Forecasts of general aviation, military and unmanned aerial systems (UAS) activity are contained in this chapter. Commercial passenger and cargo activity will be presented separately in a forecast addendum after the master plan's air service consultant provides an overview of their findings to the City officials. The two elements of the forecast chapter will be consolidated in the final forecast chapter.

The forecasts are consistent with PDT's current role as a regional general aviation airport, with scheduled commercial passenger and express service provided by FAR Part 135 air carriers.

Unless specifically noted, the forecasts of activity are unconstrained and assume that the facility improvements necessary to accommodate anticipated demand can be provided. Through the evaluation of airport development alternatives later in the master plan, the City of Pendleton will consider if any unconstrained demand will not or cannot be reasonably met.

The FAA-defined airport master plan forecasting process for general aviation airports is designed to address elements critical to airport planning by focusing on two key activity segments: based aircraft and aircraft operations (takeoffs & landings). Detailed breakdowns of these are provided including aircraft fleet mix, activity peaking, distribution of local and itinerant operations, and the determination of the critical aircraft, also referred to as the design aircraft. The commercial air service elements at Eastern Oregon Regional Airport including enplaned passengers, annual aircraft operations, commercial aircraft fleet mix, and enplaned air cargo will be evaluated as a specific activity. Other unique activity segments at Eastern Oregon Regional Airport include military and unmanned aerial systems (UAS). Existing aviation activity forecasts are examined and compared against current and recent historical activity.

The design aircraft represents the most demanding aircraft type or family of aircraft that uses an airport on a regular basis (a minimum of 500 annual takeoffs & landings). The existing and future design aircraft are used to define the airport reference codes (ARC) to be used in airfield planning. The activity forecasts also provide consistency in evaluating future demand-based facility requirements such as runway and taxiway capacity, aircraft parking and hangar capacity, and other planning evaluations such as airport noise.

Forecast Process

The Federal Aviation Administration (FAA) provides guidance on forecasting aviation activity in airport master planning projects. FAA Advisory Circular (AC) 150/5070-6B, Airport Master Plans, outlines seven standard steps involved in the forecast process:

1) **Identify Aviation Activity Measures**: The level and type of aviation activities likely to impact facility needs. For general aviation, this typically includes based aircraft and operations. Common measures related to commercial air service include enplaned passengers and cargo, fleet mix and aircraft operations.
2) **Previous Airport Forecasts**: May include the FAA Terminal Area Forecast (TAF), state or regional system plans, and previous master plans.
3) **Gather Data**: Determine what data are required to prepare the forecasts, identify data sources, and collect historical and forecast data.
4) **Select Forecast Methods**: There are several appropriate methodologies and techniques available, including regression analysis, trend analysis, market share or ratio analysis, exponential smoothing, econometric modeling, comparison with other airports, survey techniques, cohort analysis, choice and distribution models, range projections, and professional judgment.
5) **Apply Forecast Methods and Evaluate Results**: Prepare the actual forecasts and evaluate for reasonableness.

6) **Summarize and Document Results**: Provide supporting text and tables as necessary.
7) **Compare Forecast Results with FAA's TAF**: Follow guidance in FAA Order 5090.3C, Field Formulation of the National Plan of Integrated Airport Systems. In part, the Order indicates that forecasts should not vary significantly (more than 10 percent) from the TAF. When there is a greater than 10 percent variance, supporting documentation should be supplied to the FAA. The aviation demand forecasts are then submitted to the FAA for their approval.

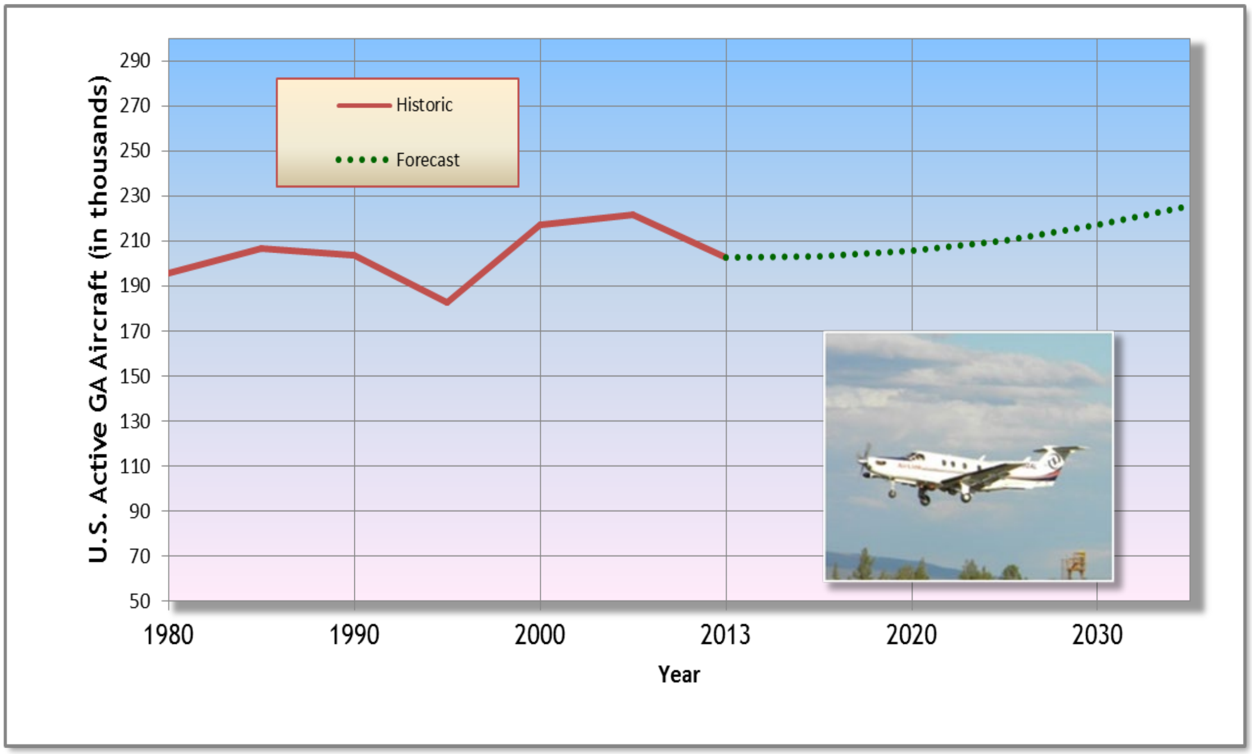
National General Aviation Activity Trends

The first fifteen years of the 21st Century was a tumultuous time for General Aviation (GA). The industry was battered by poor economic conditions and steadily rising fuel prices that slowed growth and negatively affected elements such as aircraft manufacturing, on-demand air travel, aircraft ownership, and aircraft utilization levels. Ongoing concerns over the potential replacement and future availability of 100LL aviation gasoline (AVGAS) have also created uncertainty within general aviation. On a national level, most measures of GA activity declined sharply through the "great recession" and have only recently started to show modest signs of improvement.

The FAA's long-term forecasts predict that the U.S. active GA aircraft fleet will grow modestly at an average annual rate of 0.4 percent between 2014 and 2035.[1] As depicted in **Figure 3-1**, the active GA fleet is expected to increase by approximately 15,400 aircraft over the next twenty years (+8 percent). The FAA forecasts reflect net growth that will be realized through a combination of new aircraft production and fleet attrition.

[1] FAA Aerospace Forecast Fiscal Years 2015-2035

FIGURE 3-1: US ACTIVE GENERAL AVIATION AIRCRAFT FORECAST



Data maintained by the FAA show significant system-wide declines of several key general aviation activity indicators between 2001 and 2014 (piston hours flown -34%; active piston aircraft -16%; active GA pilots -7%). AVGAS consumption levels dropped every year between 2001 and 2014, ending 30 percent below 2001 levels.

It is noted that within the overall forecast growth, several segments are projected to decline in actual numbers including single engine piston aircraft (-12%) and multi-engine piston aircraft (-8%). These declines reflect attrition of an aging fleet, which is not being fully offset by new aircraft production. Encouraging areas within the GA fleet are found in turboprops (particularly single engine) (+37%), experimental aircraft (+35%), sport aircraft (+144%), and business jets (+77%) growth through 2035. In addition to stronger production activity, these aircraft segments are experiencing lower levels of fleet attrition.

Aircraft manufacturing has shown positive gains in recent years after an extended period of weak sales. Worldwide GA aircraft deliveries in 2014 totaled 2,454 units, an increase of 4.3 percent over the previous year, but about 11 percent below recent peak of shipments in 2008.[2] The adaption of both turbine and diesel engines for small general aviation aircraft by several established manufacturers is positive indication that evolving engine technology may be a significant factor in the long-term future of general aviation. In

[2] General Aviation Manufacturers Association (GAMA), 2014 Delivery Report

addition, the resurgence of unleaded automobile gasoline powered small aircraft engines may provide a reliable power source for a growing Light Sport Aircraft (LSA) and experimental aircraft fleet.

Although the FAA maintains a moderately favorable long-term outlook, many of the activity segments associated with piston engine aircraft and AVGAS consumption are not projected to return to "pre-recession" levels until the 2025 to 2035 timeframe. Although some segments of general aviation are expected to grow at moderately high rates, most measures of the general aviation industry suggest modest, sustained growth in the range of 1 to 2 percent annually is expected over the next 20 years. The FAA's annual growth assumptions for individual general aviation activity segments are summarized in **Table 3-1.**

TABLE 3-1: FAA LONG RANGE FORECAST ASSUMPTIONS (U.S. GENERAL AVIATION)

ACTIVITY COMPONENT	FORECAST ANNUAL AVERAGE GROWTH RATE (2014-2035)
Components with Annual Growth Forecast < 0%	
Single Engine Piston Aircraft in U.S. Fleet	-0.6%
Multi-Engine Piston Aircraft in U.S. Fleet	-0.4%
Hours Flown - GA Fleet (Piston AC)	-0.5%
Student Pilots (Indicator of flight training activity)	-0.3%
AVGAS (Gallons consumed - GA only)	-0.1%
Private Pilots	-0.3%
Components with Annual Growth Forecast < 1%	
Commercial Pilots / Airline Transport Pilots	0.4% / 0.5%
Instrument Rated Pilots	0.2%
Active Pilots (All Ratings, excluding Airline Transport)	0.1%
GA Operations at Towered Airports (all AC types)	0.9%
Active GA Fleet (# of Aircraft)	0.4%
Components with Annual Growth Forecast 1%-2%	
Experimental Aircraft in U.S. Fleet	1.4%
Turboprop Aircraft in U.S. Fleet	1.5%
Components with Annual Growth Forecast > 2%	
Piston Helicopters in U.S. Fleet	2.1%
Sport Pilots	5.2%
Turbine Helicopters in U.S. Fleet	2.8%
Light Sport Aircraft in U.S. Fleet	4.3%
Turbojet Aircraft in U.S. Fleet	2.8%
Hours Flown - GA Fleet (Turbine AC)	2.9%
Hours Flown – Experimental AC	2.4%
Hours Flown – Light Sport AC	5.1%
Jet Fuel (Gallons consumed – GA only)	2.5%
Source: FAA Long Range Aerospace Forecasts (FY 2015-2035)	

Airport Service Area

The airport service area refers to the geographic area surrounding an airport that generates most "local" activity. A 30- or 60-minute surface travel time is used to approximate the boundaries of a service area for a typical general aviation airport and a three-hour drive time is used to approximate the boundaries of a commercial service airport. The population, economic characteristics, and capabilities of competing airports within an airport's service area are important factors in defining locally-generated demand for aviation facilities and services, and influence the airport's ability to attract transient aircraft activity.

Figure 3-2 illustrates the approximate boundary of an estimated 30- and 60-minute drive from Eastern Oregon Regional Airport within the local area. Competing airports located beyond the service area typically have less impact on local airport activity due to the redundancy provided by closer facilities. With numerous airports nearby, service areas often overlap, creating competition between airports for items such as hangar space, fuel, and aviation services. These items are sensitive to cost, convenience, and quality of facilities or services for both locally based and transient users. The airport's commercial service area, often referred to as the "catchment area," will be addressed separately in the commercial activity evaluation.

Table 3-2 lists the publicly owned, public use airports within a 50 nautical mile (air miles) radius of Eastern Oregon Regional Airport. It is noted that some of the public use airports listed provide competitive facilities and services with master plans that provide for future facility expansion.

TABLE 3-2: PUBLIC USE AIRPORTS IN VICINITY OF EASTERN OREGON REGIONAL AIRPORT

AIRPORT	LOCATION/DIST. (NAUT.MILES)	RUNWAY LENGTH (FEET)	LIGHTED RUNWAY	FUEL
Hermiston Municipal Airport	20 NW	4,500	MIRL	100LL, Jet-A
Martin Field	28 NE	3,819	LIRL	100LL, MOGAS
Walla Walla Regional Airport	33 NE	6,527	HIRL	100LL, Jet-A
Tri-Cities Airport	36 NW	7,711	HIRL	100LL, Jet-A
Lexington Airport	38 SW	4,156	MIRL	100LL
Richland Airport	42 NW	4,009	MIRL	100LL, Jet-A
Boardman Airport	42 W	4,200	MIRL	None
La Grande/Union County Airport	43 SE	6,260	MIRL	100LL, Jet-A
Prosser Airport	50 NW	3,451	MIRL	100LL

Hermiston Municipal Airport (HRI) is the closest airport in the service area that provides similar general aviation facilities and services. HRI has one 4,500-foot runway, instrument approach capabilities, on-field weather observation, and aircraft fuel. Other nearby airports (Pasco, Walla Walla, La Grande/Union County) also accommodate general aviation operations with a full range of facilities and services. Pasco and Walla also accommodate scheduled commercial air service.

Figure 3-2: Airport Service Area

Socioeconomic Trends and Forecasts

City of Pendleton Economy

Historically, downturns in general aviation activity often occur during periods of weak economic conditions and growth typically coincides with favorable economic conditions. It is evident that the recent economic recession and the slow recovery that followed, has constrained general aviation activity locally, statewide, and throughout the national airport system. However, as indicated in the FAA's national long-term aviation forecasts, the overall strength of the U.S. economy is expected to sustain economic growth over the long-term, which will translate into modest to moderate growth in aviation activity.

Manufacturing, agriculture, and food processing have historically led the City of Pendleton's local and regional economy. While these industries continue to grow, in recent years the region has experienced a broader base of new employment segments such as warehousing and distribution, technology and data centers, tourism, unmanned aircraft systems (UAS), and clean technology. According to the City of Pendleton's Economic Development Resource Guide, Pendleton's key industries include:

Manufacturing

Pendleton has a long history in supporting manufacturing beginning with the historic Pendleton Woolen Mill, a weaving mill built in 1909 and still in operation. In 2000, Keystone RV Manufacturing opened in Pendleton, which has continued to grow with the merger of Dutchman RV Manufacturing in 2013.[3] In addition, Pendleton is home to two long time saddle producers, Hamley and Company and Severe Brothers Saddlery.

Warehousing and Distribution

In the last fifteen years, both FedEx and Walmart have constructed distribution centers in the region. The region is centrally located between Seattle, Portland, Spokane, and Boise with multiple transportation options for shipping and receiving including rail, interstate highway, and air cargo. Although the large distribution facilities are located outside of Pendleton, the impact on the local and regional economies extends throughout Umatilla County.

Agriculture and Food Processing

Agriculture and food processing has a long history in Pendleton. The region's climate and dry land makes the area an excellent location for growing wheat and other crops. Pendleton is home to the 100-year old Pendleton Flour Mill and Newly Wed Foods, which deliver bulk flour and food coatings around the world. Barhyte Specialty Foods is located in Pendleton, and produces private label specialty sauces for

[3] East Oregonian. Wheeler, Natalie. New RV Plant will add 125 jobs in Pendleton. September 24, 2013.

supermarkets and restaurants chains. More recently, The Prodigal Son Brewery & Pub, Pendleton's first craft brewery, opened in 2010 and now provides both local service and distribution throughout Oregon.

Aviation and Unmanned Aerial Systems

Aviation has been a vital part of Pendleton's history for more than 80 years. The Airport opened in 1934 and during World War II, airport facilities were expanded to accommodate military training activities. After the war, the airport was transferred from federal to local (City of Pendleton) ownership to serve the community's air transportation needs. The Airport is home to a diverse group of tenants and users located both on the-airport and in the adjacent Airport Industrial Park. The airport is located within the Pendleton UAS Range (PUR). PUR covers an area of 14,000 square miles and the airport is the designated test site airport for the PUR. Initial activity involving civilian UAS systems began in 2013 and programs are currently under development to obtain required FAA regulatory approvals for ongoing UAS activity.

The Oregon Army National Guard facility located on the airport supports helicopter and unmanned aerial vehicle (UAV) flight operations. SeaPort Airlines provides scheduled passenger air service at Eastern Oregon Regional Airport. SeaPort's current schedule consists of 22 weekly departures and arrivals between Pendleton and Portland with 9-passenger Cessna Caravan turboprop aircraft. Empire Airlines, a contract operator for FedEx, provides 5-day per week air cargo service between Spokane, Pendleton, and La Grande.

Umatilla County Economy

Umatilla County's economy has historically been led by government, healthcare & social assistance, retail trade, manufacturing, and farming. Over the next twenty years, farming and manufacturing employment are forecast to decline slightly, while government and healthcare & social assistance are expected to grow. **Table 3-3** summarizes current and projected employment (by industry segment) in Umatilla County.

TABLE 3-3: UMATILLA COUNTY EMPLOYMENT DATA

INDUSTRY	2011 EMPLOYMENT	% OF TOTAL EMP	2015 EMPLOYMENT	% OF TOTAL EMP	2035 EMPLOYMENT	% OF TOTAL EMP
State & Local Government	6,206	16%	6,341	15.6%	6,888	13.6%
Healthcare & Social Assistance	4,127	10.7%	4,507	11.1%	6,779	13.4%
Retail Trade	4,019	10.4%	4,281	10.5%	5,646	11.2%
Manufacturing	3,429	8.8%	3,434	8.5%	3,367	6.7%
Farm	3,101	8%	3,086	7.6%	2,948	5.8%
Transportation & Warehousing	2,713	7%	2,890	7.1%	3,869	7.6%
Accommodation & Food Services	2,379	6.1%	2,541	6.3%	3,423	6.8%
Other	12,795	33%	13,553	33.4%	17,702	35%

Note 1: 2011 Employment (Historic); 2015 and 2035 Employment (Forecast)
Note 2: Percentages of employment are rounded
Source: Woods and Poole Economics– Umatilla County Employment Data (2014)

A review of seasonally adjusted unemployment over the last fifteen years indicates Umatilla County typically has higher levels of unemployment than Oregon's statewide average.[4] This is often a reflection of seasonal industries such as agriculture that experience distinct seasonal shifts in employment. From 2000 through 2014, average annual county unemployment levels were higher than the statewide levels in twelve of fifteen years. During this period, unemployment in Umatilla County peaked at 10.3 percent in 2010, while Oregon's peak level (11.3 percent) was experienced in 2009. During a two-year period in 2009 and 2010, Oregon's statewide unemployment rate was higher than Umatilla County. Statewide and Umatilla County unemployment rates were the same (9.5%) in 2011. This short-lived trend appeared to reflect the prolonged impacts of Oregon's slow recovery from the recent recession. In February 2015, Umatilla County's unemployment rate was 7.8 percent while Oregon's unemployment rate was 6.2 percent.[5] The per capita income for Umatilla County in 2014 was $33,240, approximately 15 percent below Oregon's per capita income level of $39,286. A summary of historical and forecast income and employment data are provided in **Table 3-4**.

[4] Oregon Employment Department data

[5] United States Department of Labor, Bureau of Labor Statistics, Local Area Unemployment Statistics Map (February 2015)

TABLE 3-4: PER CAPITA PERSONAL INCOME & EMPLOYMENT DATA

	HISTORICAL		FORECAST				
	2000	2011	2015	2020	2025	2030	2035
Per Capita Income (in current dollars)							
U.S.	$30,319	$41,561	$46,411	$56,808	$72,344	$93,177	$120,708
State of Oregon	$28,728	$37,528	$41,760	$50,960	$64,731	$83,172	$107,496
Umatilla County	$21,944	$30,701	$34,326	$41,901	$53,159	$68,170	$87,893
Umatilla County % of Oregon	76.4%	81.8%	82.2%	82.2%	82.1%	81.9%	81.7%
Employment (Umatilla County)							
# Jobs	38,022	38,769	40,606	42,976	45,434	47,985	50,622
Source: Woods and Poole Economics– U.S., Oregon, and Umatilla County Data (2014)							

Population

In broad terms, an airport's service area population affects the type and scale of aviation facilities and services that can be supported. Although a large number of airport-specific factors can affect activities at an airport, changes in population often reflect other broader economic conditions that may also affect airport activity. The Eastern Oregon Regional Airport service area extends beyond the City of Pendleton and Umatilla County and includes portions of Benton and Walla Walla counties in Washington, and Union and Morrow counties in Oregon. However, for the purpose of forecasting aviation activity, an evaluation of local city and Umatilla county population trends will provide a reasonable indication of activity.

Historical Population

Certified estimates of population for Oregon counties and incorporated cities are developed annually by the Portland State University (PSU) Population Research Center. The annual PSU estimates, coupled with the decennial U.S. Census, provide an indication of local area population trends over an extended period.[6] The 2014 PSU certified population estimate for the City of Pendleton was 16,700; the 2014 PSU estimate for Umatilla County was 78,340.

The City of Pendleton's population has declined slightly since the 2010 Census, while Umatilla County has experienced a modest population increase. Annual population growth over the last 25 years has been modest, averaging 1 percent or less, compared to statewide average growth that is typically between 1 and 2 percent per year. Recent historical population data and average growth rates for the City of Pendleton, Umatilla County, and Oregon are summarized in **Table 3-5**.

[6] Portland State University Population Research Center July 1, 2014 estimates; 1990, 2000, 2010 U.S. Census

TABLE 3-5: HISTORICAL POPULATION

YEAR	UMATILLA COUNTY	CITY OF PENDLETON (INCORPORATED AREA ONLY)	PENDLETON SHARE (%) OF UMATILLA COUNTY POPULATION	OREGON
1990[2]	59,249	15,142	25.6%	2,842,337
2000[1]	70,548	16,354	23.2%	3,421,399
2010[1]	75,889	16,745	22.1%	3,831,074
2014[2]	78,340	16,700	21.3%	3,962,710
Average Annual Rates (AAR) of Growth				
	Umatilla County	City of Pendleton		Oregon
1990-2000	1.7%	.77%		1.87%
2000-2010	.73%	.23%		1.14%
2000-2014	.75%	.15%		1.05%
2010-2014	.79%	(.06%)		.8%
1. U.S. Census data 2. Portland State University certified annual estimates.				

Population Forecasts

Two recent forecasts of local population were reviewed to evaluate future growth expectations for the City of Pendleton and Umatilla County. Both forecasts indicate local population will grow at a slower rate than Oregon's population over the next twenty years, although the projected growth is consistent the area's historical record of population growth. Future population growth within the airport service area is expected to be a positive factor affecting future activity at Eastern Oregon Regional Airport. **Table 3-6** summarizes the population forecasts for the current planning period.

Oregon Office of Economic Analysis (OEA)

The Oregon Office of Economic Analysis (OEA) periodically generates long-term population forecasts to support local and statewide planning. The most recent OEA long-term forecasts released in March 2013 projected modest, sustained growth for Umatilla County through 2050. Within the current twenty-year master planning horizon, Umatilla County's population is projected to increase from 76,000 in 2010 to 98,820 in 2035. This reflects an overall increase of 30 percent over the 25-year period at a 1.06 percent average annual growth rate.[7]

[7] Office of Economic Analysis-Forecasts of Oregon's County Population and Components (March 28, 2013)

TABLE 3-6: PENDLETON, UMATILLA COUNTY & OREGON POPULATION FORECASTS

	2010	*2010 CENSUS*	*2014 PSU EST.*	2015	2020	2025	2030	2035
City of Pendleton								
Population Forecast[1] (1.06% AAR 2010-2035)	18,392	16,745	16,700	19,090	20,172	21,384	22,668	23,914
Umatilla County								
OEA Forecast[2] (1.06% AAR 2010-2035)	76,000	75,889	78,340	78,887	83,359	88,366	93,673	98,820
Oregon								
OEA Forecast[2] (1.06% AAR, 2010-2035)	3,837,300	3,831,074	3,962,710	4,001,600	4,252,100	4,516,200	4,768,000	4,995,200
City % of County Population	24.2	22.0	21.3	24.2	24.2	24.2	24.2	24.2
Umatilla County % of Oregon Population	1.98	1.98	1.97	1.97	1.96	1.95	1.96	1.97

1. Winterbrook Planning, Technical Memo: 2033 Population Projection
2. Prepared by Office of Economic Analysis, Department of Administrative Services, State of Oregon (March 28, 2013)

City of Pendleton Population Forecast

A population forecast was prepared for the City of Pendleton in February 2011, to support local planning using existing State of Oregon Office of Economic Analysis (OEA) long-term forecasts for Umatilla County.[8] The forecast projected annual population growth of 1.06 percent for both the City and Umatilla County through 2033. Pendleton's urban area accounts for approximately 24.2 percent of Umatilla County's population in current and future projections. The City of Pendleton's population is projected to increase from 18,392 to 23,914 (+30%) between 2010 and 2035 (2035 data was extrapolated based on the OEA annual growth rate). The forecast represents an expectation that the city and county population growth will keep pace with Oregon's statewide growth over the next twenty years.

It is noted that recent estimates of Pendleton's population (2010 Census and the 2014 PSU certified estimate), generated after the OFM forecasts were published, show a decline from the 2010 base year population used in the OFM forecast. The PSU certified estimate for 2014 (16,700) is approximately 13 percent lower than the forecast for 2015 (19,090). The initial trend appears to be deviating from the long-term forecast, although the forecast's relatively low annual growth rates (1 percent) suggest that it may be premature to adjust the forecast or to modify long term assumptions based on the first four years of a forty-year forecast.

[8] Winterbrook Planning, Technical Memorandum 1: 2033 Population Projection (February 16, 2011)

Overview of Recent Local Events

Commercial Air Service

Horizon Airlines served Eastern Oregon Regional Airport under a contract with the U.S. Department of Transportation, Essential Air Service (EAS) program prior to November 2008. This agreement provided a subsidy for two of the three 37-seat Q200 flights that operated between Pendleton and Portland. In 2008, Horizon Airlines phased out the 12 remaining 37-seat Q200s in their fleet, replacing them with larger 76-seat Q400s. During an EAS contract bid, Horizon Airlines sought to change its route, opting for one-stop flights from Pendleton to Pasco then to Seattle. With the upgrade to the larger aircraft, Horizon's proposal included reducing the frequency of flights in and out of Pendleton to one roundtrip daily. The City of Pendleton opted to maintain its Portland service after evaluating Horizon's proposal against other providers, and chose SeaPort Airlines proposal, which offered three daily roundtrip flights to Portland with smaller 9-seat aircraft.[9] A detailed description of the status of commercial air service is provided in the evaluation of commercial aviation activity.

Unmanned Aerial Systems (UAS)

As noted in the Inventory chapter, Eastern Oregon Regional Airport is the designated test site airport for the Pendleton UAS Range, which received initial FAA operating approval in September, 2014. UAS activity on the airport includes both military and civilian operations. However, civilian UAS activity has been slow to develop as it is subject to the FAA's current rule-making process. Military UAS activity is not regulated by FAA, so the majority of activity to date has been generated by the Oregon Army National Guard (OANG). OANG indicates that approximately 260 flight hours have been logged by Shadow unmanned aerial vehicles (UAV) at Eastern Oregon Regional Airport since May 2013, averaging about 130 hours per year. OANG estimates UAVs account for 10 percent of "tower tracked" operations at the airport, with helicopters accounting for 90 percent. Based on a total of 2,802 military operations recorded by the control tower in 2014, this translates into approximately 280 military UAV operations. Combined with a limited amount of civilian activity, the current level of UAS/UAV activity at the Airport is estimated to be approximately 300 annual operations. This number is expected to increase significantly as OANG expects to increase its activity and civilian testing and training activity becomes established. The control tower UAS/UAV operations counts (takeoffs and landings) are not recorded by aircraft type, but by user group (e.g., military, general aviation, etc.).

[9] Department of Transportation. Essential Air Service at Pendleton, Oregon. Order reselecting carrier and setting final subsidy rates, Order 2008-10-25 (October 21, 2008)

Fuel Data

Fuel records provided by the airport's fixed base operator (FBO), indicate the volume of 100LL (AVGAS) and Jet-A have declined significantly over the last several years. Historical fuel data is summarized in **Table 3-7**. [10] While changes in commercial air service and related fueling activities would be expected to impact jet fuel volumes, the decline in reported aviation gasoline sales is perplexing. For example, the annual sales of 100LL reported at Eastern Oregon Regional Airport have not exceeded 10,000 gallons since 2005, with a low of 1,369 gallons reported in 2011. The reported fuel sales yield averages as low as 30 gallons per based piston aircraft, well below the volumes generated at most general aviation airports. By comparison, nearby Lexington Airport, with a total of 9 piston engine-based aircraft, had a total of 10,871 gallons of 100LL delivered in the twelve months extending from April 2012 to March 2013, which is approximately 120 gallons per based aircraft. Ken Jernstedt Airfield in Hood River has averaged 36,000 gallons of 100LL over the last five years with about 90 based aircraft, or about 400 gallons per based aircraft.

TABLE 3-7: PDT FBO REPORTED FUEL SALES (HISTORICAL)

YEAR	100LL[1] (GALLONS)	JET-A[1] (GALLONS)	AIRCRAFT OPERATIONS[2] (GA/COMMERCIAL)
2005	21,782	81,923	23,359
2006	7,004	96,075	20,769
2007	9,221	63,827	18,412
2008	6,598	28,419	18,125
2009	5,422	34,071	16,049
2010	2,653	19,936	11,985
2011	1,369	25,478	12,370
2012	1,830	13,521	11,150
2013	2,007	32,138	12,057
2014	4,127	24,478	9,579

1. PDT FBO reported fuel sales 2005-2014
2. Air Traffic Activity System (ATADS) Tower Operations 2005-2014

Although aircraft fueling patterns may be affected by a variety of market conditions, the significant decline in sales volumes reported to the airport in recent years should be examined further. To ensure consistency and uniform contributions among airport users, the City should consider modifying its airport fuel flowage fee policy to assess all aviation fuel deliveries to the airport, rather than retail sales. This would ensure that both private tenant and commercial fueling activities are contributing to the airport's revenues. Aviation fuel distributors provide a record of deliveries to airports if required, as condition for conducting commercial activities on the premises.

[10] Pendleton Aviation (FBO) reported fuel sales from 2005-2011

Airport Traffic Control Tower (ATCT) Operations Counts

Eastern Oregon Regional Airport has an airport traffic control tower operating from 6 am to 8 pm daily. Although the tower operates 14 hour per day, tower management estimates that their aircraft operations counts reflect approximately 95 percent of total traffic at the airport. Based on this assumption, the 2014 aircraft operations count (12,381) from the airport traffic control tower reflects total airport operations of approximately 13,033 for 2014. It is recommended that the adjusted 2014 aircraft operations level be used as the baseline for the updated aircraft operations forecast.

The commercial activity generated at the Airport includes scheduled passenger and cargo service. Based on current flight schedules, a portion of this activity involves arrivals/departures before 6 am or after 8 pm. The OANG estimates approximately 12.5 percent of its helicopter activity involves night training when the tower is closed indicting that this segment of activity is not fully captured in tower counts and should be adjusted in baseline activity estimates. UAS activity is currently restricted to daylight hours and is reflected in tower operations counts by category of user (e.g., military, general aviation, etc.).

A review of historical tower data for Eastern Oregon Regional Airport (1990 through 2014) reflects an overall decline in operations that has involved several incremental downward steps. Aircraft operations levels in 2014 were 63 percent lower than 1990. Between 1990 and 2004, airport operations consistently topped 30,000, and once exceeded 40,000 (1998). This was followed by four consecutive years (2005-2008) with at least 20,000 operations and six consecutive years (2009-2014) where annual operations fluctuated between 10,000 and 20,000.

Table 3-8 summarizes historical airport traffic control tower aircraft operations counts for the Airport. **Figure 3-3** depicts the historical aircraft operations data.

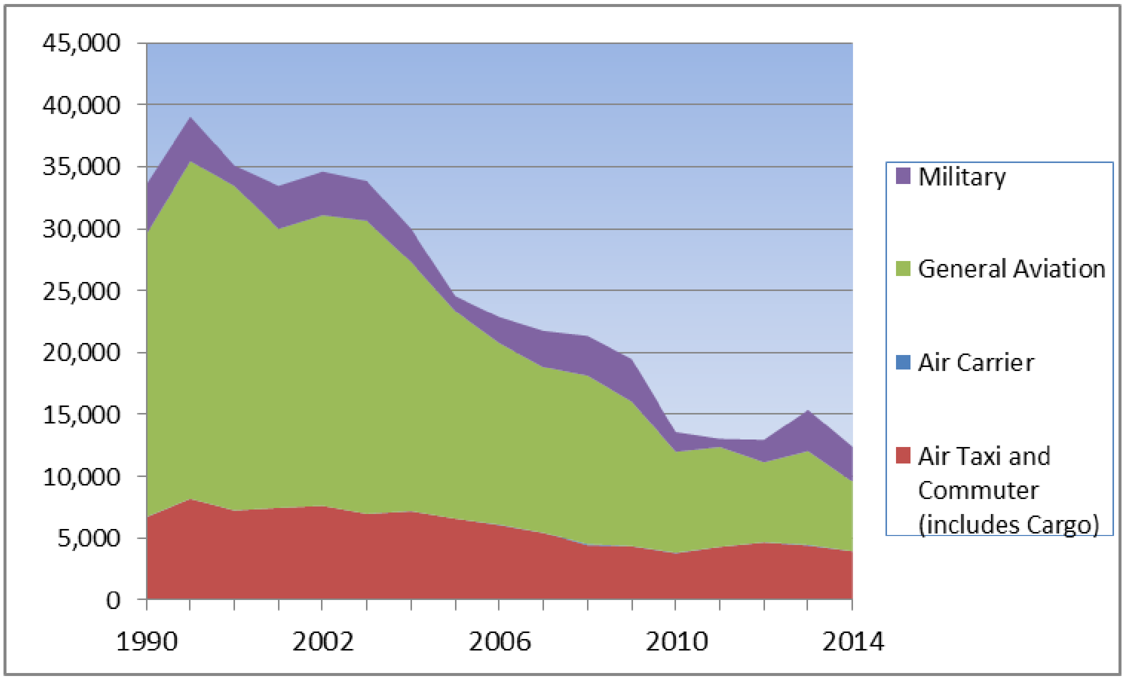
TABLE 3-8: AIR TRAFFIC ACTIVITY SYSTEM (ATADS) TOWER OPERATIONS

YEAR	AIR CARRIER	AIR TAXI AND COMMUTER	GENERAL AVIATION	MILITARY	TOTAL AIRCRAFT OPERATIONS
1990	22	6,708	22,809	4,024	33,563
1995	4	8,181	27,274	3,605	39,064
2000	8	7,247	26,225	1,636	35,116
2001	4	7,456	22,537	3,483	33,480
2002	4	7,621	23,473	3,525	34,623
2003	12	6,969	23,669	3,214	33,864
2004	10	7,191	20,104	2,696	30,001
2005	0	6,594	16,765	1,212	24,571
2006	36	6,081	14,652	2,094	22,863
2007	18	5,447	13,356	2,933	21,754
2008	86	4,429	13,610	3,220	21,345
2009	16	4,343	11,690	3,441	19,490
2010	34	3,792	8,159	1,582	13,567
2011	10	4,291	8,069	663	13,033
2012	16	4,651	6,481	1,795	12,943
2013	53	4,407	7,589	3,338	15,387
2014	6	3,940	5,633	2,802	12,381

Source: OPSnet – Air Traffic Activity System (ATADS) Tower Operations 1990-2014
Glossary: **Air Carrier** is an aircraft with seating capacity of more than 60 seats or a maximum payload capacity of more than 18,000 pounds carrying passengers or cargo for hire or compensation.
Air Taxi is an aircraft designed to have a maximum seating capacity of 60 seats or less or a maximum payload capacity of 18,000 pounds or less carrying passengers or cargo for hire or compensation. The FAA TAF combines Air Taxi and Commuter activity in a single category.

Although commercial activity has declined in real numbers from recent peaks, the segment currently represents a larger percentage (32 percent) of total airport operations than it did in 1990 (20 percent). General aviation represents the largest single decline in airport activity over the last 25 years. In 1990, general aviation accounted for 68 percent of operations. In 2014, general aviation accounted for 46 percent of total airport operations. There appears to be no clear, single cause for the recent decline and in fact it may reflect a combination of macroeconomic conditions, competition from other nearby airports, and a variety of airport-specific factors.

FIGURE 3-3: EASTERN OREGON REGIONAL AIRPORT – ANNUAL AIRCRAFT OPERATIONS (ATCT)



Terminal Area Forecast (TAF) Data

As noted by the Federal Aviation Administration (FAA): *"The Terminal Area Forecast (TAF) is the official FAA forecast of aviation activity for U.S. airports. It contains active airports in the National Plan of Integrated Airport Systems (NPIAS) including FAA towered airports, Federal contract towered airports, nonfederal towered airports, and non-towered airports. Forecasts are prepared for major users of the National Airspace System including air carrier, air taxi/commuter, general aviation, and military. The forecasts are prepared to meet the budget and planning needs of FAA and provide information for use by state and local authorities, the aviation industry, and the public."*

When reviewing FAA TAF data, it is important to note that when there is no change from year to year it often indicates a lack of data, rather than no change in activity. Similarly, a large change in data in a single year may follow updated reporting that captures changes that occurred over several years. At Eastern Oregon Regional Airport, the availability of airport traffic control tower activity counts provides a more reliable basis for estimating air traffic than at non-towered airports. However, based aircraft data is periodically updated based on airport management reports and updates of airport master plans with FAA approved forecasts.

A review of historical TAF operations data for the Airport (1990 through 2013) is relatively consistent with airport traffic control tower counts described earlier in the chapter. However, the TAF based aircraft totals reflect more significant changes over time. Between 1990 and 2007 based aircraft totals reflect several adjustments within a gradual increase (data range of 62 to 108). A significant downward adjustment in data is listed in 2008, with 39 based aircraft, a reduction of 69 aircraft from the previous year. The basis for this adjustment is unknown, although it appears some reduction in based aircraft at the airport occurred–perhaps over time–that was not accurately reflected in the annual data immediately preceding the adjustment. The TAF currently lists 46 based aircraft, which is well below the recent airport management count of 71 aircraft documented in the 2002 master plan. The forecast data within the TAF maintains 46 based aircraft at the airport through 2040. TAF data on passenger enplanements are relatively consistent with changes in commercial air service noted elsewhere in this chapter.

Table 3-9 summarizes historical TAF based aircraft, aircraft operations, and passenger enplanement data for the Airport, as currently published by the FAA.

TABLE 3-9: FAA TAF DATA – EASTERN OREGON REGIONAL AIRPORT

YEAR	AIRCRAFT OPERATIONS	BASED AIRCRAFT	PASSENGER ENPLANMENTS
1990	27,522	76	8,759
2000	36,957	97	13,990
2001	34,090	101	14,408
2002	34,759	106	10,427
2003	34,435	107	9,169
2004	29,899	106	8,037
2005	26,091	108	6,851
2006	23,291	108	7,494
2007	22,088	103	7,194
2008	21,837	39	8,073
2009	19,624	39	3,947
2010	13,128	46	4,900
2011	12,221	46	4,955
2012	12,286	46	4,986
2013	17,268	46	4,284
2014	12,541	50	4,268
2015*	11,848	71	4,232

* 2015 TAF data is estimated.

Commercial Air Service

As noted previously, Eastern Oregon Regional Airport is currently served by SeaPort Airlines, operating a nine seat Cessna Caravan 208 with 22 nonstop roundtrips per week to Portland International Airport (PDX). SeaPort Airlines is on a four-year Essential Air Service (EAS) contract that began January 1, 2013. Since air transportation and the airline industry are always changing, a Passenger Demand Analysis (included in **Appendix B)** was conducted to provide the necessary data needed to compile objective air service forecasts. The analysis included a thorough review of the current airline industry, current service provided at Pendleton, and the airline market for Pendleton's service area. This information was used to create four likely scenarios for the City of Pendleton to consider for its future service needs. The four scenarios included:

1. Maintain existing EAS service with SeaPort Airlines 9-seat aircraft;
2. Maintain EAS service with a larger aircraft;
3. Maintain existing EAS service with a 9-seat aircraft while adding new leisure market service on a once-weekly basis; or
4. A. Continuing service with a 9-seat aircraft operating without an EAS subsidy;
   B. Loss of scheduled service.

The City of Pendleton has selected a forecast that assumes a change in service to include larger aircraft based on a review of the air service forecast scenarios. The Passenger Demand Analysis used PenAir, a regional carrier operating 30-seat Saab SF-340 aircraft, as a model airline with service operating under EAS subsidies for similar size communities in Oregon such as Klamath Falls.

The selected forecast assumes a 1.64 percent average annual growth rate for passenger demand. Forecast passenger enplanements range from 4,174 in 2014 to 5,900 in 2035. The forecast assumes changes in service frequency to accommodate targeted load factors. Service frequency would average 8 or 9 departures per week, with 1.2 to 1.3 departures per day. Annual operations are projected to decline from current levels by 2020, due to the change in service levels (aircraft size and reduced frequency), then decline slightly further in subsequent forecast years as the carrier manages its passenger load factors. The forecast level of service in 2035 is equivalent to a 47 percent load factor. With an EAS subsidy, it is expected that a load factor above 30 percent would make the route viable. Without an EAS subsidy, the carrier would require closer to a 70 percent load factor.

Table 3-10 summarizes forecast commercial air service activity at Eastern Oregon Regional Airport. It should be noted the air taxi/commuter operations category includes both passenger and cargo operations using aircraft with 60 seats or less, and a maximum payload capacity of 18,000 pounds. The table shows passenger air taxi/commuter operations separate from cargo "other" air taxi/commuter operations.

TABLE 3-10: EASTERN OREGON REGIONAL AIRPORT – COMMERCIAL AIR SERVICE FORECAST

DESCRIPTION	HISTORIC	FORECAST			
	2014	2020	2025	2030	2035
Operations					
Air Carrier	6	0	0	0	0
Passenger Air Taxi/Commuter	2,214	930	930	890	840
Other Air Taxi	1,599	1,990	2,090	2,180	2,290
Total	**3,819**	**2,920**	**3,020**	**3,070**	**3,130**
Passenger Enplanements					
Air Carrier	0	0	0	0	0
Air Taxi/Commuter	4,174	4,600	5,000	5,400	5,900
Total	**4,174**	**4,600**	**5,000**	**5,400**	**5,900**
Annual Departures	1,107	465	465	445	420
Seats per Departure	9	30	30	30	30
Total Available Seats	9,963	13,950	13,950	13,350	12,600
Annual Enplanements	4,174	4,600	5,000	5,400	5,900
Boarding Load Factor	.42	.33	.36	.40	.47

Other Air Taxi Operations

Air taxi activity includes operations regulated by the FAA under FAR Part 135, including scheduled passenger service with small aircraft (discussed in the previous section), on-demand passenger service (charter and fractional), small parcel transport (cargo), and air ambulance activity. Air taxi activity at Eastern Oregon Regional Airport currently includes all of these categories.

The FAA Terminal Area Forecast (TAF) classifies air taxis as "air taxi & commuter," although the airport traffic control tower records commercial activity as either "air carrier" or "air taxi." Historical and forecast "Other" air taxi operations at Eastern Oregon Regional Airport are listed in **Table 3-10**.

Air Cargo

Empire Airlines, a contract operator for FedEx, provides scheduled air cargo (express) service between Spokane, Pendleton, and La Grande using a Cessna Caravan 208 aircraft. The aircraft schedule has two morning and afternoon arrivals/departures at Eastern Oregon Regional Airport on a 5-day per week schedule. Ameriflight, a contract operator for UPS, previously operated on a 5-day per week schedule using a Beechcraft 1900 aircraft. Ameriflight recently relocated its service to Hermiston Airport and currently uses Pendleton when conditions require.

The Boeing Commercial Airplane World Air Cargo Forecast 2014-2015 indicates package express activity in North America flattened in recent years, averaging 5.4 million daily deliveries in 2011 and 2012. Activity in 2013 increased to 5.5 million daily deliveries (+10%), which appears to be consistent with the overall improvement in economic conditions. Boeing projects that North America express activity (revenue tonne-kilometers) will average 2.2 percent annual growth through 2025, then 2.1 percent annually through 2035. This growth rate appears to be reasonable to apply to enplaned and deplaned air cargo at Eastern Oregon Regional Airport through the twenty-year planning period.

A review of current cargo volume and aircraft fleet mix suggests the current schedule can accommodate a significant increase in cargo weight without requiring additional flights or larger aircraft. Based on the Empire flight schedule and potential for occasional Ameriflight activity, it is reasonable to maintain a static air cargo operations level based on 20 operations per week (1,040 annual operations) through the twenty years planning period.

Table 3-11 summarizes forecast cargo activity at Eastern Oregon Regional Airport.

TABLE 3-11: EASTERN OREGON REGIONAL AIRPORT – CARGO FORECAST

DESCRIPTION	HISTORICAL	FORECAST			
	2014	2020	2025	2030	2035
Cargo Operations	1,024	1,040	1,040	1,040	1,040
Total Enplaned Cargo (Tons)	129	150	165	180	200
Total Deplaned Cargo (Tons)	183	210	235	260	290

General Aviation Activity

Based Aircraft

A review of current based aircraft was performed in order to provide the most accurate data for estimating current activity and developing updated activity forecasts. Airport staff provided a current based aircraft list, identifying 67 total based aircraft in February of 2015. This number was subsequently increased to 71 based on the Oregon Army National Guard (OANG) reporting of four unmanned aerial vehicles in addition to six CH47-Chinook helicopters.

The based aircraft fleet mix is primarily single engine piston airplanes with a small number of multi-engine piston airplanes, ultralights, and helicopters. The current based aircraft count is summarized in **Table 3-12**.

TABLE 3-12: EASTERN OREGON REGIONAL AIRPORT BASED AIRCRAFT

AIRCRAFT TYPE	TOTAL
Based Aircraft – Updated 2015 Count	
Single-Engine Piston	39
Multi-Engine Piston	2
Turboprop	1
Turbojet	0
Rotorcraft (Civilian)	14
Ultralight	5
Military (Rotorcraft)	6
Military (UAS/UAV)	4
Total Based Aircraft	**71**

Aircraft Operations

As noted earlier, the airport traffic control tower recorded a total of 12,381 aircraft operations in 2014. Based on the tower's 14-hour per day (6am to 8pm) operating schedule, tower management estimates their aircraft operations count reflects approximately 95 percent of airport traffic.

The Pendleton airport traffic control tower recorded 5,633 general aviation operations in 2014. Based on the 95 percent assumption noted above, approximately 297 additional general aviation operations would occur when the tower is closed, increasing total general aviation operations to 5,930. OANG reports that approximately 12.5 percent (360 operations) of their current helicopter activity involves night training when the tower is closed. A review of Seaport Airlines current (March 2015) flight schedule indicates that 11 of 44 (25%) weekly arrivals/departures at Eastern Oregon Regional Airport occur when the tower is closed, totaling 572 operations if extended over 12 months. These activity segments generate approximately 1,229 operations (+9.9%), over and above the 12,381 operations recorded in 2014.

The adjusted estimate of aircraft operations summarized below is recommended for use as the base year for updated aircraft operations forecasts:

Eastern Oregon Regional Airport Activity Summary – 2014

- Airport Traffic Control Tower Operations (6am to 8pm): 12,381
- Aircraft Operations Outside Tower Hours of Operation (8pm to 6 am): 1,229
- **Total Operations:** ` **13,610**

Aviation Activity Forecasts (Existing Forecasts)

Three existing aviation forecasts for Eastern Oregon Regional Airport are available to compare with current activity, recent historical trends, and the updated forecasts prepared for the master plan:

- 2002 Airport Master Plan Report
- 2007 Oregon Aviation Plan
- FAA Terminal Area Forecasts (TAF) (2014 update)

The existing forecasts have been reviewed but not modified to reflect recent events. Minor adjustments (interpolation, extrapolation) have been made to present each projection with common forecast year intervals. Although some projections may be obsolete relative to current activity (in actual numbers), the existing forecasts provide a useful gauge of future growth rates that are generally consistent with national and statewide expectations for defining general aviation activity.

Existing based aircraft and operations forecasts are summarized below and in **Tables 3-13** and **3-14.** Updated forecasts have been developed and are presented later in the chapter.

Based Aircraft Forecasts

2002 Airport Master Plan

The 2002 Airport Master Plan Report[11] forecasts project an increase from 97 to 117 (+20) based aircraft between 1999 and 2020, which reflects an average annual growth rate of 0.89 percent. The forecast has reached its mid-point and provides an opportunity to assess the accuracy of the growth assumptions. The based aircraft forecast for 2015 (interpolated) is 110, which is 39 aircraft above the current count of 71 based aircraft. The airport's current based aircraft total of 71, is 46 lower than the forecast for 2020—five years from now.

The previous master plan forecast did not anticipate the sharp reduction in based aircraft noted earlier in the FAA's TAF data. However, it is unknown whether the reduction is a true reflection of a significant loss of aircraft or simply an adjustment of based aircraft counts, which may have been estimated. Either scenario renders the forecast obsolete, although the underlying growth rate is well within the normal range accepted by FAA for most general aviation airports.

FAA Terminal Area Forecast (TAF)

The FAA TAF (January 2015 update) provides a static projection of 46 based aircraft at Eastern Oregon Regional Airport from 2014 through 2040, which represents average annual growth of 0 percent. The 2015

[11] David Evans and Associates, Mead & Hunt Inc., and Pavement Services Inc. (October 2002)

airport management count of based aircraft (71 aircraft) indicates that current levels are 54 percent above the TAF. Recently updated airport-specific information indicates that current TAF based aircraft forecasts do not provide a reliable projection of future demand.

TABLE 3-13: EXISTING BASED AIRCRAFT FORECASTS – EASTERN OREGON REGIONAL AIRPORT

EXISTING FORECASTS	2000	2005	2010	2015	2020	2025	2030	2035
2002 Airport Master Plan Update (.88% AAR 1999-2020)	97[1]	103	108	110[2]	117	-	-	-
2007 Oregon Aviation Plan (1.08% AAR 2005-2025)	-	108	114	118	126[2]	134	-	-
FAA Terminal Area Forecast (Jan. 2015) (0% AAR 2014-2040)	97	108	39	46	46	46	46	46

1. 1999 forecast base year
2. Interpolated between forecast years

On a regional level, the 2013-2040 Terminal Area Forecast projects the number of based aircraft (general aviation) in the Northwest-Mountain Region to increase at an annual average rate of 0.96 percent through 2040.

2007 Oregon Aviation Plan (OAP)

The 2007 Oregon Aviation Plan contains based aircraft forecasts for Oregon's public use airports for the 2005-2025 timeframe. For Eastern Oregon Regional Airport, the OAP projects-based aircraft to increase from 108 to 134 (+26) between 2005 and 2025, which represents average annual growth of 1.08 percent. The current based aircraft total of 71 aircraft is well below the 2015 OAP forecast of 118 aircraft (-51 aircraft) and is tracking well below the projected levels for 2025. As with the master plan forecast described above, the OAP does not provide an accurate projection of future demand.

Aircraft Operations Forecasts

2002 Airport Master Plan

The 2002 Airport Master Plan Report projected annual aircraft operations increasing from 34,537 to 56,309 between 1999 and 2020, which reflects an average annual growth rate of 2.36 percent. The control tower operations count for 2014 (12,381) is less than 25 percent of the master plan operations forecast for 2015, which effectively renders the master plan forecast obsolete.

FAA Terminal Area Forecast (TAF)

The FAA TAF (January 2015 update) projects aircraft operations at Eastern Oregon Regional Airport increasing from 12,541 to 13,039 between 2014 and 2040, which represents average annual growth of 0.15 percent over the 26-year period. Despite the significant discrepancy in the TAF based aircraft data, the aircraft operations forecast appears to be reasonable and provides a valid comparison with other forecasts.

On a regional level, the 2013-2040 Terminal Area Forecast projects itinerant operations (commercial, GA, military) in the Northwest-Mountain Region increasing at an annual average rate of 1.1 percent through 2040.

2007 Oregon Aviation Plan (OAP)

The 2007 Oregon Aviation Plan forecast projects annual aircraft operations at Eastern Oregon Regional Airport increasing from 26,091 to 29,836 between 2005 and 2025, which represents average annual growth of 0.67 percent. The control tower operations count for 2014 (12,381) is less than 50 percent of the OAP operations forecast for 2015, which effectively renders the forecast invalid.

TABLE 3-14: EXISTING OPERATIONS FORECASTS – EASTERN OREGON REGIONAL AIRPORT)

EXISTING FORECASTS	2000	2005	2010	2015	2020	2025	2030	2035
2002 Airport Master Plan Update (2.36% AAR 1999-2020)	34,537[1]	47,653	50,614	53,386[2]	56,309	-	-	-
2007 Oregon Aviation Plan (0.67% AAR 2005-2025)	-	26,091	24,777	26,691	28,443[2]	29,836	-	-
FAA Terminal Area Forecast (Jan. 2015) (0.15% AAR 2014-2040)	36,957	26,091	13,128	12,350	12,485	12,620	12,759	13,039

1. 1999 forecast base year
2. Interpolated between forecast years

Updated General Aviation Forecasts

Based Aircraft

Updated general aviation-based aircraft forecasts at Eastern Oregon Regional Airport have been prepared based on a review of recent socioeconomic data, existing aviation activity forecasts, and current conditions. The significant decline (-27 percent) in based aircraft at the airport since the last master plan was prepared in 2002 is reflected in FAA data and current airport management counts. The Oregon Army National Guard (OANG) currently has 10 aircraft based at their facility, including six helicopters and four unmanned aerial vehicles (UAV). OANG indicates there are no current plans to increase their aircraft fleet. For planning purposes, a static projection of 10 military aircraft will be added to the recommended general aviation-based aircraft forecast through the planning period.

The accuracy of historical based aircraft counts cannot be verified and therefore should be viewed with some degree of skepticism. Many airports have difficulty in maintaining consistent, accurate counts of based aircraft due to a variety of factors. Reporting has improved in recent years through the development of the FAA's www.basedaircraft.com webpage, although outdated entries are relatively common.

Assuming the based aircraft data are relatively accurate, the trend may reflect a combination of factors such as general economic conditions, competition from other airports, availability of hangar space, fixed base operator (FBO) services, and fuel or storage leasing costs. The general sense of local airport officials is the recent decline in activity has bottomed out and activity will begin to increase as services are improved, business expands, and new tenants use the airport. Based on this assumption, the current general aviation-based aircraft count of 61 represents the baseline to project future activity in a range of modest-to-moderate growth scenarios.

Several projections were developed based on common market share techniques and population-based demand. Given the wide range of growth rates of the projections, a mid-range (mean) projection is the recommended based aircraft forecast. The updated general aviation-based aircraft forecasts are presented in **Table 3-15**.

Eastern Oregon Regional Airport: Umatilla County Population

The ratio of general aviation-based aircraft to county population has fluctuated in recent years from approximately 0.78 to 1.4 aircraft per 1,000 residents. Based on the 2014 Umatilla County population (78,340) and the January 2015 count of 61 general aviation-based aircraft, the current based aircraft to county population ratio is 0.78.

The Oregon Office of Economic Analysis (OEA) 2010-2050 population forecast for Umatilla County (see Table 3-6) served as the basis for this projection. Projections were developed based on either *constant or decreasing* based aircraft to population ratios.

Constant Population to Based Aircraft Ratio – This projection maintains the current 0.78 based aircraft per 1,000 Umatilla County resident ratio through 2035. This projection assumes based aircraft at Eastern Oregon Regional Airport will grow at the same rate as county population. General aviation-based aircraft increase from 61 to 77 based aircraft by 2035, which represents an average annual increase of **1.17 percent**.

Declining Population to Based Aircraft Ratio – This projection gradually reduces the based aircraft per 1,000 Umatilla County residents from 0.78 to 0.70 through 2035. This projection assumes based aircraft at the Airport will grow at a slower rate than county population. This methodology results in general aviation-based aircraft increasing from 61 to 69 by 2035, which represents an average annual increase of **0.62 percent**.

U.S. Active General Aviation Fleet Market Share

In 2014, Eastern Oregon Regional Airport accounted for approximately 0.031 percent of the U.S. active general aviation fleet, down from 0.047 percent in 1999. The FAA Aerospace Forecast 2015-2035 projects the active general aviation fleet will grow at an average annual rate of 0.4 percent between 2014 and 2035, increasing from 198,860 aircraft in 2014 to 214,260 in 2035. The modest net increase of 15,400 aircraft over 21 years reflects considerable fleet attrition as increasing numbers of small aircraft produced 30 to 50 years ago are removed from service. Projections were developed for Eastern Oregon Regional Airport based on *maintaining constant, increasing or decreasing* market share.

Maintain Share of U.S. Active General Aviation Fleet- This forecast maintains Eastern Oregon Regional Airport's current share of the U.S. active GA fleet at 0.031 percent. This projection assumes the Airport's growth in based aircraft will mirror the very modest forecast growth for the U.S. fleet over the next twenty years. Based on the low rate of growth projected nationally, it appears reasonable to assume the Airport has the ability to keep pace with the U.S. as the local market evolves and the community grows. General aviation based aircraft increase from 61 to 66 at Eastern Oregon Regional Airport by 2035, which represents an average annual increase of **0.39 percent**.

Increasing Share of U.S. Active General Aviation Fleet- This forecast gradually increases Eastern Oregon Regional Airport's current share of the U.S. active GA fleet from 0.031 to 0.040 percent. This projection assumes the Airport's growth in based aircraft will slightly outpace the very modest forecast growth for the U.S. fleet over the next twenty years. This scenario assumes a reversal of recent declines coupled with expanded airport business activities and continued growth in local and regional population and employment. General aviation based aircraft increase from 61 to 86 by 2035, which represents an average annual increase of **1.65 percent**.

Decreasing Share of U.S. Active General Aviation Fleet- This forecast gradually reduces the Airport's current share of the U.S. active GA fleet from 0.031 to 0.027 percent, continuing the declining trend experienced over the last fifteen years. The projection results in a small decrease from 61 to 58 general aviation based aircraft at the Airport by 2035, which represents an average annual decline of **0.25 percent.** The lower growth projection reflects a combination of factors, including competition from other airports within the local airport service area and a lowered ability to generate demand for facilities and services.

Oregon Aviation Plan Market Share

The 2007 Oregon Aviation Plan provides forecasts of Oregon's general aviation based aircraft fleet for the 2005-2025 time period. Oregon's GA fleet was projected to increase from 4,875 aircraft in 2005 to 6,225 aircraft in 2025, which represents an average annual increase of **1.23 percent**. The OAP forecast was extrapolated to 2035 to coincide with the current master plan horizon. It should be noted the OAP forecast was prepared prior to the onset of the recent economic recession and requires updating. However, the annual growth rates contained in the forecast are comparable to other accepted forecasts and the projection provides a valid upper range growth scenario.

Eastern Oregon Regional Airport accounted for approximately 2.2 percent of Oregon's general aviation-based aircraft fleet in 2005. Based on the OAP forecast for 2015, the airport's current market share is approximately 1.1 percent. Projections were developed for Eastern Oregon Regional Airport based on *maintaining and increasing* market share within the state.

Maintain Share of Oregon General Aviation Aircraft Fleet- This forecast maintains the Airport's current 1.1 percent share of the Oregon's GA fleet through the twenty-year planning period. This projection assumes the Airport's growth in based aircraft will keep pace with projected statewide forecast growth during the period. General aviation-based aircraft increase from 61 to 77 at Eastern Oregon Regional Airport by 2035, representing an average annual increase of **1.23 percent**.

Increasing Share of Oregon General Aviation Fleet- This forecast gradually increases the Airport's current share of the Oregon's general aviation aircraft fleet from 1.1 to 1.5 percent. This projection assumes the Airport's growth in based aircraft will outpace projected statewide forecast growth during the period. General aviation-based aircraft increase from 61 to 103 at Eastern Oregon Regional Airport by 2035, which represents an average annual increase of **1.5 percent**.

Decreasing Share of Oregon General Aviation Fleet- This forecast gradually reduces the Airport's current share of Oregon's GA fleet from 1.1 to 0.75 percent, continuing the declining trend experienced over the last fifteen years. This projection results in a decrease from 61 to 53 general aviation-based aircraft by 2035, which represents an average annual decline of **0.7 percent.** The lower growth projection reflects a combination of factors, including competition from other airports within the local airport service area and an inability to generate demand for facilities and services.

General Aviation Based Aircraft Forecast Summary

The forecasts described in this section provide a wide array of growth scenarios—ranging from modest decline to moderate growth. Although the decline in general aviation-based aircraft at Eastern Oregon Regional Airport appears to be relatively consistent with the declining levels of general aviation aircraft operations, there is no evidence to indicate that the downward trend will continue in light of otherwise positive economic indicators. For this reason, a mid-range projection was developed that represents the mean of the updated based aircraft forecasts. The "composite" forecast results in an increase from 61 to 74 general aviation-based aircraft by 2035, which represents an average annual increase of **0.97 percent.**

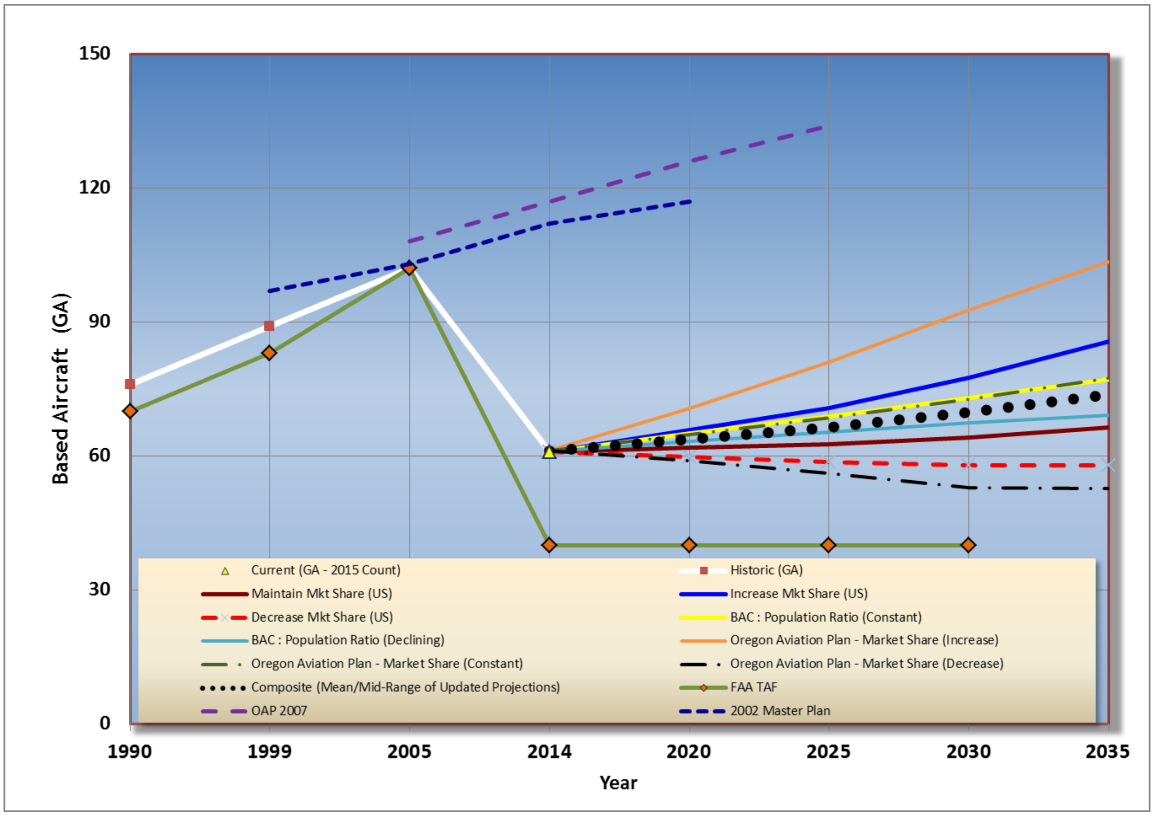
A **Mid-Range "Composite" Based Aircraft** projection is recommended as the preferred forecast for use in the airport master plan. This projection assumes the Airport will be able to arrest recent declines in aircraft and sustain modest growth consistent with growth anticipated in the local and regional economy. The projection assumes the ongoing efforts of the City of Pendleton to effectively and proactively manage all aspects of airport facilities and business operations will provide a desirable environment that will contribute to attracting and retaining based aircraft and airport businesses catering to general aviation.

Table 3-15 summarizes the based aircraft forecasts. **Figure 3-4** presents a graphic depiction of the based aircraft forecasts.

TABLE 3-15: GA AIRCRAFT FORECASTS – EASTERN OREGON REGIONAL AIRPORT

	2014/15 (ACTUAL)	2020	2025	2030	2035
Market Share of U.S. Active GA Aircraft					
Decreasing Market Share (-0.25 %AAR)	61	60	59	58	58
Constant Market Share (0.38% AAR)	61	62	63	64	66
Increasing Market Share (1.65% AAR)	61	66	71	78	86
Aircraft Per 1,000 Residents (Umatilla County)					
Declining Ratio (-0.25 %AAR)	61	63	65	67	69
Constant Ratio (0.38% AAR)	61	65	69	73	77
Market Share of Oregon GA Aircraft					
Decreasing Market Share (-0.70 %AAR)	61	59	56	53	53
Constant Market Share (1.17% AAR)	61	65	68	73	77
Increasing Market Share (2.65% AAR)	61	71	81	93	103
Composite Projection					
Mid-Range (Mean) (Recommended) (0.97% AAR)	**61**	**64**	**66**	**70**	**74**

FIGURE 3-4: GA BASED AIRCRAFT FORECASTS – EASTERN OREGON REGIONAL AIRPORT



Based Aircraft Fleet Mix

The airport's current mix of based aircraft is primarily made up of single engine aircraft, but includes a diverse mix of aircraft types, including helicopters and unmanned aerial vehicles (UAV). The based aircraft fleet mix during the planning period is expected to remain predominantly single-engine piston aircraft and helicopters, with a growing number of multi-engine piston aircraft, turbine aircraft, and light sport aircraft. It is anticipated that the majority of the non-military unmanned aerial systems/vehicles (UAS/UAV) will be associated with testing and training operations at the UAS test range and will not be permanently based at the airport.

Table 3-16 summarizes the projected based aircraft fleet mix for the planning period. The table separates civilian and military aircraft to illustrate the individual segments. **Figures 3-5A and 3-5B** depict the current (2015) and long term (2035) distribution of based aircraft by type.

TABLE 3-16: EASTERN OREGON REGIONAL AIRPORT FORECAST BASED AIRCRAFT FLEET MIX

ACTIVITY	2015	2020	2025	2030	2035
Civilian Aircraft					
Single Engine Piston	39	40	40	41	42
Multi-Engine Piston	2	2	2	2	3
Turboprop	1	1	1	2	3
Business Jet	0	0	1	1	1
Ultralight/LSA	5	6	6	7	8
Helicopter	14	15	15	16	16
UAS/UAV	0	0	1	1	1
Subtotal – Civilian Aircraft	61	64	66	70	74
Military Aircraft					
Helicopter	6	6	6	6	6
UAS/UAV	4	4	4	4	4
Subtotal – Military Aircraft	10	10	10	10	10
Total Based Aircraft	71	74	76	80	84

FIGURE 3-5A: EASTERN OREGON REGIONAL AIRPORT – BASED A/C FLEET MIX (JAN 2015)

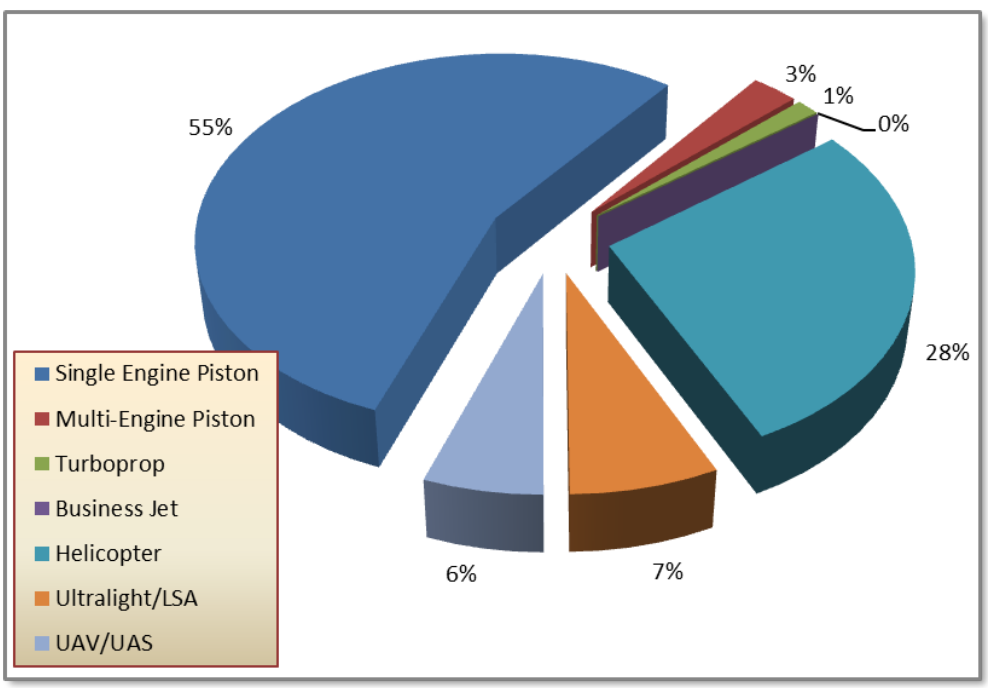
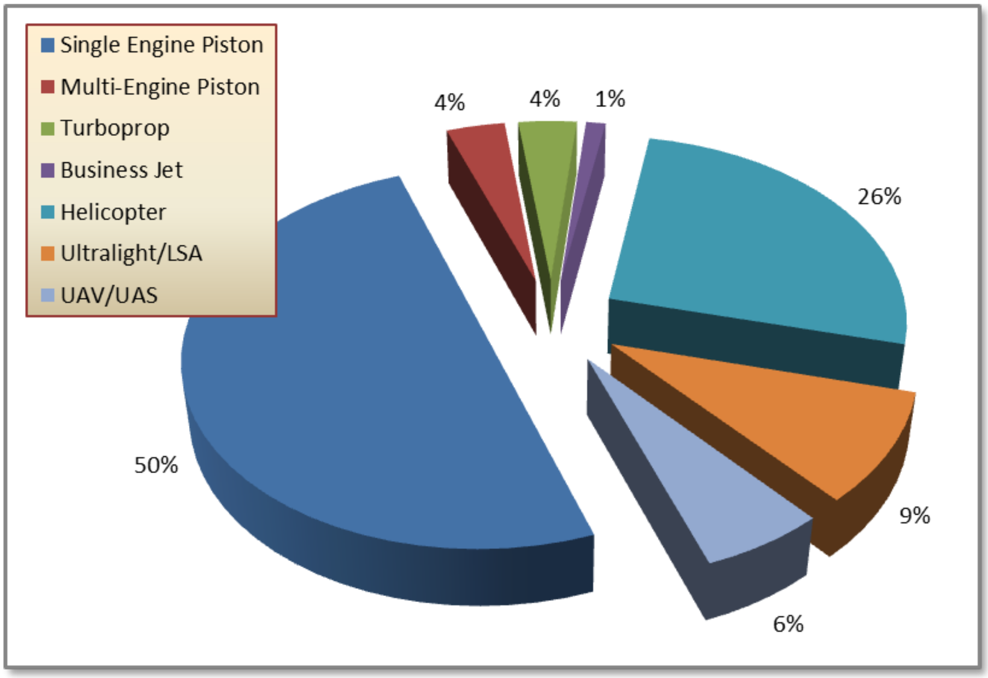


FIGURE 3-5B: EASTERN OREGON REGIONAL AIRPORT – FORECAST BASED A/C FLEET MIX (2035)



Aircraft Operations

Updated general aviation (GA) aircraft operations projections have been developed for comparison with existing forecasts in order to identify a selected forecast for the master plan. The updated operations forecasts use the previously described 2014 airport traffic control tower counts that were adjusted to capture activity that occurs when the control tower is closed.

The GA operations forecasts were developed by applying ratios of operations to based aircraft to reflect activity generated by locally-based and transient aircraft. A second GA operations forecast was developed using the average annual growth rate experienced at Oregon's ten towered airports between 2010 and 2014.

Table 3-17 summarizes the general aviation aircraft operations forecasts. Operations Per Based Aircraft (OPBA) Projections

The 2014 adjusted GA operations total for Eastern Oregon Regional Airport was 5,930, with a total of 61 GA based aircraft (97 operations per based aircraft). This level of activity is relatively low, as the common range of activity at many general aviation airports ranges from 200 to 450 operations per based aircraft.

The 2002 master plan assumed a ratio of 350 operations per based aircraft in its general aviation operations forecast. This assumption was based on historical FAA TAF data (1990-1999) that averaged 334 operations per based aircraft. Many airports experienced significant declines in aircraft utilization during the recent economic recession. As economic conditions have improved, aircraft utilization has begun to slowly recover at most airports. This trend suggests the potential exists for the aircraft operations ratios at Eastern Oregon Regional Airport to improve over time. A continued decline in activity ratios below current levels deviates significantly from industry norms and does not appear to be sustainable based on facility capabilities and local market factors.

OPBA Forecast (Constant Ratio)

This projection maintains the 97 operations-per-based aircraft ratios through the twenty-year planning period reflected in the adjusted 2014 ATCT counts. The projection assumes aircraft utilization will remain at current levels as the airport maintains its competitive position in the service area. Future growth in aircraft operations is driven primarily by a net increase in based aircraft and retention of the current user base. The forecast is compatible with current airfield capabilities and the aircraft operational fleet mix would not change significantly. The projection results in general aviation aircraft operations increasing at average annual growth rate of **0.90 percent** between 2014 and 2035.

OPBA Forecast (Increasing Ratio 1)

This projection assumes a gradual increase from 97 to 140 operations per based aircraft through the planning period. The projection assumes aircraft utilization will gradually increase above current levels as the airport captures a larger share of transient aviation activity within the service area and locally based aircraft increase flight activity. The increase in aircraft utilization reflects the underlying strength of the local economy, the ability to attract increased transient aircraft, and the market potential for fixed base operator (FBO) services. The projection results in general aviation aircraft operations increasing at average annual growth rate of **2.67 percent** between 2014 and 2035.

OPBA Forecast (Increasing Ratio 2)

This projection assumes a slightly steeper increase from 97 to 200 operations per based aircraft through the planning period. The projection assumes the airport is able to capitalize on regional market opportunities noted in the previous projection and effectively compete with other airports in its service area. The projection results in general aviation aircraft operations increasing at average annual growth rate of **2.67 percent** between 2014 and 2035.

Oregon Towered Airports – Composite Growth Rate (GA Operations) 2010 -2014

A review of recent general aviation activity at Oregon's ten towered airports[12] was conducted to gauge the region's performance as the recent economic recession ended and overall economic conditions improved. The group of towered airports recorded 533,089 general aviation operations in 2014, up 6.5 percent above 2010 levels. The four-year growth results in an average annual growth rate of 1.59 percent. A projection was developed for Eastern Oregon Regional Airport by applying the **1.59 percent** growth rate to the 2014 base year operations through the planning period.

GA Operations Summary

The **OPBA – Increasing Ratio 1** projection is recommended as the preferred GA aircraft operations forecast. Similar to the recommended based aircraft forecast, this projection assumes the Airport will be able to arrest recent declines in activity and sustain modest growth consistent with growth anticipated in the local and regional economy.

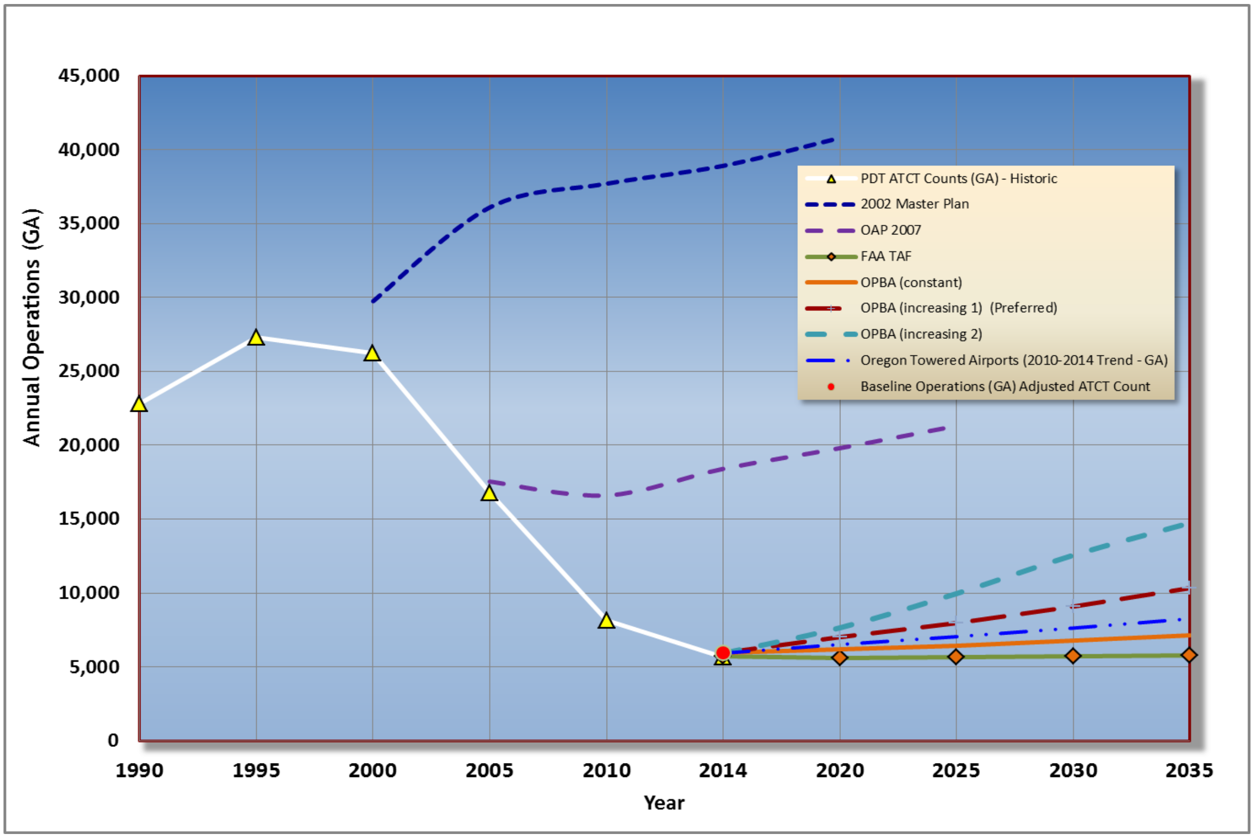
Figure 3-6 depicts the general aviation aircraft forecasts.

TABLE 3-17: GA AIRCRAFT FORECASTS – EASTERN OREGON REGIONAL AIRPORT

	2014/15 (ACTUAL)	2020	2025	2030	2035
OPBA (Constant Ratio) (0.90% AAR)	5,930	6,186	6,446	6,770	7,151
OPBA (Increasing Ratio 1) (2.76% AAR) – Recommended	**5,930**	**7,015**	**7,974**	**9,073**	**10,321**
OPBA (Increasing Ratio 2) (4.43% AAR)	5,930	7,652	9,968	12,562	14,744
Oregon Towered Airport (2010-2014) Composite Growth – GA Operations (1.59% AAR)	5,930	6,519	7,054	7,633	8,259
FAA TAF (-0.71% AAR)	5,732	5,586	5,646	5,710	5,775

[12] EUG, HIO, LMT, MFR,OTH,PDT,PDX,RDM,SLE, and TTD; ATADS Report

FIGURE 3-6: EASTERN OREGON REGIONAL AIRPORT GENERAL AVIATION OPERATIONS FORECAST



Instrument Flight Activity

Flight activity data for aircraft operating under instrument flight rules in the national airspace system is tracked by FlightAware, a company that developed live flight tracking services for commercial and general aviation. Instrument flight plan data for 2014 was acquired to help gauge both instrument activity and to provide verification of business class aircraft operating (commonly operating under IFR flight plans) at Eastern Oregon Regional Airport. The data captures all civil aircraft filing instrument flight plans listing Eastern Oregon Regional Airport either as the originating airport or the destination airport. Military aircraft are not included in the FAA instrument flight plan data. Based on current traffic estimates, instrument operations currently account for about 26 percent of total tower operations in 2014. **Table 3-18** summarizes the 2014 instrument flight plan activity at Eastern Oregon Regional Airport.

TABLE 3-18: INSTRUMENT OPERATIONS – EASTERN OREGON REGIONAL AIRPORT (2014)

ARC	REPRESENTATIVE AIRCRAFT	2014[1]
A-I	Cessna 182/Beechcraft Baron 55/TBM700	171
B-I	Beechcraft Baron 58/Beechcraft King Air 90/Cessna Citation Jet (CJ1)	224
A-II	Cessna Caravan/Pilatus PC12	2,712
B-II	Cessna Citation Bravo/Beechcraft King Air 200/Falcon 50	81
A-III	Douglas DC-3	0
B-III	ATR72/DH8A	66
C-I	Hawker HS125, Learjet 31	0
C-II	Bombardier Challenger	32
C-IV	Lockheed C130	0
D-I	Learjet 35	10
D-II	Gulfstream IV, V	14
--	Blocked (assumed to be 70% B-I/B-II Jet and 30% C-I/D-I/D-II Jet)	14
--	Helicopter	3
	Total Instrument Operations	3,327

Source: PDT FlightAware Data from 12/30/2013 to 1/1/2015

Local and Itinerant Operations

Aircraft operations consist of aircraft takeoffs and landings, which are classified as local or itinerant. Local operations are conducted in the vicinity of an airport and include flights that begin and end at the airport. These include local area flight training, touch and go operations, flightseeing, glider operations, and other flights that do not involve a landing at another airport. Itinerant operations include flights between airports, including cross-country flights. Itinerant operations reflect specific travel between multiple points, often associated with business and personal travel.

The airport traffic control tower operations count for 2014 was 26 percent local and 74 percent itinerant. The FAA TAF provides a similar traffic distribution (29 percent local/71 percent itinerant) for current and forecast operations. The 2002 airport master plan assumed 33/67 percent local/itinerant split in its forecast. A 27 percent local and 73 percent itinerant split, which is an average of the ATCT and TAF data is applied to the updated operations forecast. Local and itinerant data for each forecast year are summarized in **Table 3-19**.

TABLE 3-19: GENERAL AVIATION LOCAL/ITINERANT OPERATIONS

GENERAL AVIATION OPERATIONS	2014/15 (ACTUAL)	2020	2025	2030	2035
Total Operations	**5,930**	**7,015**	**7,974**	**9,073**	**10,321**
Local Operations	1,541	1,894	2,153	2,450	2,787
Itinerant Operations	4,388	5,121	5,821	6,623	7,534

Military Operations

Eastern Oregon Regional Airport's military operations are primarily conducted by the Oregon Army National Guard (OANG), which currently operates a fleet of six Chinook CH-47 helicopters and four unmanned aerial vehicles (UAV). The airport also accommodates a small amount of transient helicopter and fixed wing aircraft activity. Historical military operations data at Eastern Oregon Regional Airport are listed in **Table 3-20**.

OANG officials indicate that their 2014 flight hour breakdown was 84 percent helicopter and 16 percent UAV. OANG indicates that 100 percent of their UAV activity occurs during the operating hours of the air traffic control tower (ATCT), since UAVs are not currently authorized to fly between sunset and sunrise. OANG estimates that 25 percent of their helicopter operations occur at night, and about half of those (12.5 percent) occur when the ATCT is closed. Based on this assessment, approximately 360 additional military helicopter operations occurred at Eastern Oregon Regional Airport in 2014 when the ATCT was closed. The combined total of tower and non-tower military operations at Eastern Oregon Regional Airport in 2014 is estimated to be 3,162. It is noted that aircraft operations recorded by ATCT are by category of user (air carrier, air taxi, general aviation, and military) and do not identify aircraft types (fixed wing, helicopter, UAV, etc.).

OANG indicates that there is no expectation of significant growth in military activity at Eastern Oregon Regional Airport. However, funding may be received to develop facilities to support their current unmanned aerial systems (UAS) program. OANG reports that UAS flight hours over the last two years averaged approximately 130 hours per year. Based on ATCT records, it is estimated that 280 military UAV operations occurred at the airport in 2014.

For forecasting purposes, it is assumed that current levels of military helicopter activity will be maintained through the planning period. Based on the relatively new and growing industry developing around unmanned aerial systems/vehicles (UAV/UAS), and the established use of this technology by the military, moderate growth (5% annual growth) in military UAS/UAV activity at Eastern Oregon Regional Airport is assumed through the planning period. **Table 3-18** summarizes forecast military activity at Eastern Oregon Regional Airport.

TABLE 3-20: EASTERN OREGON REGIONAL AIRPORT – MILITARY OPERATIONS FORECAST

ACTIVITY	2014	2020	2025	2030	2035
Helicopter	2,882	2,900	2,900	2,900	2,900
UAS/UAV	280	380	480	610	780
Total	**3,162**	**3,280**	**3,380**	**3,510**	**3,680**

UAS Operations

Eastern Oregon Regional Airport's unmanned aerial system (UAS) activity includes civilian and military components. As noted earlier, the Oregon Army National Guard (OANG) currently generates approximately 280 annual UAS operations at the airport. Civilian UAS at the airport is at its earliest development stage and has not yet generated significant flight activity. However, civilian UAS activity is directly driven by customer demand that is expected to fluctuate widely. The addition of one or two customers with a limited number of active flying days per year has the potential of generating several hundred UAS operations annually. Major shifts in activity could occur at any time, which makes estimating current "baseline" activity challenging. For forecasting purposes, current "baseline" civilian UAS activity at Eastern Oregon Regional Airport is estimated up to 500 annual operations.

The following assessment of UAS activity at Eastern Oregon Regional Airport was prepared by Peak 3, Inc., the UAS range manager for the City of Pendleton:

> Predicted growth of Unmanned Aircraft Systems (UAS) flight operations and associated airport infrastructure at KPDT is uncertain at this time. The domestic Unmanned Aircraft industry is restricted by yet-to-be written and implemented FAA regulations governing the use of UAS in the National Airspace System (NAS).
>
> The Pendleton UAS Range is part of the Pan-Pacific UAS Test Range Complex, one of six FAA designated Test Sites established as a result of the FAA Modernization and Reform Act of 2012. The intent of the Pendleton Test Range is to provide the FAA with testing data to assist them in the development of regulations for integration of Manned and Unmanned Aircraft into the NAS.
>
> The UAS regulatory environment is changing rapidly and this state of uncertainty directly affects the commercial industry's ability to conduct UAS operations for commercial applications. The selection of the six Test Sites in December 2013 established a foundational process to achieve FAA flight approval for selective UAS but these requirements have significantly evolved over the past year. As an example, since Jan 2014, the FAA also added additional avenues for commercial operations through the Section 333 exemption process, an additional requirement to obtain aircraft registration (N Numbers) which increases configuration control requirements, selective

companies were allowed to commercially operate as "trusted partners" (CNN, Precision Hawk and BNSF Railroad), and a small UAS (sUAS) proposed rule (NPRM) to allow for flight operations using UAS less than 55 pounds and flying up to 400 feet. As such, the Test Site environment and market have evolved drastically and the landscape continues to change daily.

While dependent on the regulatory environment, we expect the growth rate of UAS at KPDT to have minimal impact on overall numbers over the next five years.

Despite the uncertainty associated with civilian UAS development, the airport master plan requires at a minimum, order-of-magnitude projections of UAS activity to support future facility planning. It is recognized that any future estimates of activity at this early stage of development are merely placeholders and that actual activity could deviate significantly within the planning period. It appears that the majority of UAS activity at Eastern Oregon Regional Airport will be associated with operator (pilot) training and systems research, development and flight testing. A unique characteristic of the UAS/UAV sector is the ability for the aircraft to operate for extended periods. The capabilities of the aircraft combined with the primary mission requirements result in a relatively low ratio of takeoffs and landings per flight hour, compared to conventional aircraft.

Two UAS/UAV forecast scenarios were developed that reflect the uncertainties noted above:

The ***Baseline UAS Projection*** assumes the current baseline of 500 annual civilian UAS operations will be maintained through the twenty-year planning period. The projection recognizes fluctuations may occur within the civilian UAS segment, but the projection provides a reasonable gauge of activity potential. The military UAS activity described earlier is well established and not subject to the same uncertainties as the civilian segment.

The **Growth** ***UAS Projection*** assumes the current baseline of 500 annual civilian UAS operations will be maintained to 2020 then activity will increase at an annual rate of 10 percent through 2035. The projection recognizes the significant potential of the civilian UAS market and the unique role of the Pendleton UAS Test Range and Eastern Oregon Regional Airport as a center for this activity. Total UAS activity at the airport includes the civilian noted here and the military UAS activity presented previously in **Table 3-20**.

Table 3-21 summarizes forecast UAS activity at Eastern Oregon Regional Airport.

TABLE 3-21: EASTERN OREGON REGIONAL AIRPORT – UAS OPERATIONS FORECAST

ACTIVITY	2014	2020	2025	2030	2035
Baseline UAS Projection					
Civilian	500	500	500	500	500
Military	280	380	480	610	780
Total	**780**	**880**	**980**	**1,110**	**1,280**
Growth UAS Projection					
Civilian	500	500	800	1,300	2,100
Military	280	380	480	610	780
Total	**780**	**880**	**1,280**	**1,910**	**2,880**

Peaking Characteristics

Peak activity levels translate into facility requirements for runways, taxiways, apron space, and passenger terminal facilities. There are three primary times of peak activity, which include monthly, daily, and hourly activity.

- Peak Month – the calendar month in which peak operations or enplanements occur.
- Design Day – the average day in the peak month, obtained by dividing the peak month activity by the number of days in that month.
- Busy Day – the busy day in a typical week during the peak month.
- Design Hour – the peak hour within the design day.
- Busy Hour – the peak hour within the busy day.

The peaking characteristics for commercial passenger service reflects the modest current and forecast activity consistent with limited flight frequency and relatively low passenger volumes. The forecasts anticipate an average of one commercial departure per day, with two departures assumed one day per week. In any given peak hour, commercial activity would typically include one arrival and one departure. The scheduled commercial passenger activity generates relatively constant monthly operations throughout the year, with the peak month estimated at 9 percent of annual activity. Based on a review of airport traffic control tower records, peak month activity generated by general aviation, air cargo and military operations averages 11 percent of annual activity, which typically occurs during the summer months.

Table 3-22 summarizes peaking activity at Eastern Oregon Regional Airport.

TABLE 3-22: EASTERN OREGON REGIONAL AIRPORT – PEAKING ACTIVITY

ACTIVITY	2014	2020	2025	2030	2035
Aircraft Operations (All Activity Segments)					
Annual Operations	12,911	13,215	14,374	15,653	17,131
Peak Month (11%)	1,480	1,495	1,625	1,760	1,935
Busy Day	69	70	76	83	91
Busy Hour	14	14	15	17	18
Design Day	49	50	54	59	65
Design Hour	10	10	11	12	13
Commerical Passenger Activity					
Annual Operations	2,214	930	930	890	840
Peak Month (9%)	198	84	84	80	76
Design Day	7	3	3	3	3
Design Hour	2	2	2	2	2
Annual Enplanements	4,174	4,600	5,000	5,400	5,900
Peak Month (11%)	458	506	550	594	649
Design Day	15	17	18	20	22
TPHP *	30	34	36	40	44

Notes
Peaking numbers are rounded
Enplanements, passenger air taxi/commuter operations, and other air taxi/commuter operations data from Table 3-20 Commercial Air Service Forecast
General aviation operations data from Table 3-17: GA Aircraft Forecasts
Military operations data from Table 3-18: Military Operations Forecasts

Design Aircraft

The selection of design standards for airfield facilities is based on the characteristics of the aircraft expected to use the airport on a regular basis. The **design aircraft** is defined as the most demanding aircraft type operating at the airport with a minimum of 500 annual itinerant operations, as described in the FAA *Substantial Use Threshold*:

"Substantial 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. Under unusual circumstances, adjustments may be made to the 500 total annual itinerant operations threshold after considering the circumstances of a particular airport. Two examples are airports with demonstrated seasonal traffic variations, or airports situated in isolated or remote areas that have special needs."

The FAA groups aircraft into five categories (A through E) based on their approach speeds. Aircraft Approach Categories A and B include small propeller aircraft, many small or medium business jet aircraft, and some larger aircraft with approach speeds of less than 121 knots (nautical miles per hour). Categories C, D, and E consist of the remaining business jets and larger jet and propeller aircraft generally associated with commercial and military use. These larger aircraft typically have approach speeds of 121 knots or more. The FAA also establishes six airplane design groups (I-VI), based on the wingspan and tail height of the aircraft. The categories range from Airplane Design Group (ADG) I, for aircraft with wingspans of less than 49 feet, to ADG VI for the largest commercial and military aircraft.

The combination of airplane design group and aircraft approach speed for the design aircraft dictates the Airport Reference Code (ARC). The ARC is used to define applicable airfield design standards. Aircraft with a maximum gross takeoff weight greater than 12,500 pounds are classified as “large aircraft” by the FAA; aircraft of 12,500 pounds or less are classified as “small aircraft.” The FAA further defines airfield components through Runway Design Code (RDC) and Taxiway Design Group (TDG) designations. A list of typical general aviation and business aviation aircraft and their respective design categories is presented in **Table 3-23. Figure 3-7** illustrates representative aircraft in various design groups.

The 2002 airport master plan identified the Canadair Regional Jet (CRJ), operated by Horizon Air, as the design aircraft for Eastern Oregon Regional Airport, based on runway length requirements. The deHavilland/Bombardier Dash 8 was identified as the largest design aircraft based on wingspan. Both aircraft were identified as Airport Reference Code (ARC) C-III aircraft.

The current design aircraft at Eastern Oregon Regional Airport is the Cessna Caravan, a single-engine turboprop aircraft. The Cessna Caravan 208 is an Airport Reference Code (ARC) A-II aircraft. The future design aircraft for Eastern Oregon Regional Airport is a Saab 340, multi-engine turboprop aircraft based on the selected forecast. The Saab 340 is an ARC B-II aircraft.

TABLE 3-23: AIRCRAFT DESIGN CATEGORIES

AIRCRAFT	AIRCRAFT APPROACH CATEGORY	AIRPLANE DESIGN GROUP	MAXIMUM GROSS TAKEOFF WEIGHT (LBS)
Cessna 182 (Skylane)	A	I	3,100
Cirrus Design SR22	A	I	3,400
Cessna 206 (Stationair)	A	I	3,614
Beechcraft Bonanza A36	A	I	3,650
Socata/Aerospatiale TBM 700	A	I	6,579
Beechcraft Baron 58	B	I	5,500
Cessna 340	B	I	5,990
Cessna Citation Mustang	B	I	8,645
Embraer Phenom 100	B	I	10,472
Cessna Citation CJ1+	B	I	10,700
Beech King Air C90	B	I	11,800
Beechcraft 400A/Premier I	B	I	16,100
Piper Malibu (PA-46)	A	II	4,340
Cessna Caravan 675	A	II	8,000
Pilatus PC-12	A	II	10,450
Cessna Citation CJ2+	B	II	12,500
Cessna Citation II	B	II	13,300
Beech King Air 350	B	II	15,000
Cessna Citation Bravo	B	II	15,000
Cessna Citation CJ4	B	II	16,950
Embraer Phenom 300	B	II	17,529
Cessna Citation XLS+	B	II	20,200
Dassault Falcon 20	B	II	28,660
Bombardier Learjet 55	C	I	21,500
Raytheon/Hawker 800XP	C	II	28,000
Gulfstream 200	C	II	34,450
Bombardier Challenger 300	C	II	37,500
Bombardier Global Express 500	C	III	92,750
Bombardier Q400	C	III	65,200
Learjet 35A/36A	D	I	18,300
Gulfstream G450	D	II	73,900
Gulfstream G650	D	III	99,600
Source: AC 150/5300-13, as amended; aircraft manufacturer data.			

Figure 3-7 – Aircraft /Airport Reference Codes

Forecast Summary

The summary of forecast data is provided in **Tables 3-24 and 3-25**. As with any long-term facility demand forecast, it is recommended that long-term development reserves be protected to accommodate demand that may exceed current projections. For planning purposes, a reserve capable of accommodating a doubling of the 20-year preferred forecast demand should be adequate to accommodate unforeseen facility needs during the current planning period. However, should demand significantly deviate from the airport's recent historical trend, updated forecasts should be prepared to ensure that adequate facility planning is maintained.

TABLE 3-24: EASTERN OREGON REGIONAL AIRPORT – SUMMARY OF FORECAST DATA

DESCRIPTION	HISTORICAL	FORECAST			
	2014	2020	2025	2030	2035
Based Aircraft					
Single-Engine Piston	39	40	40	41	42
Multi-Engine Piston	2	2	2	2	3
Turboprop	1	1	1	2	3
Jet	0	0	1	1	1
Ultralight	5	6	6	7	8
Helicopter (Civilian)	14	15	15	16	16
UAS/UAV (Civilian)	0	0	1	1	1
Military (Rotorcraft)	6	6	6	6	6
Military (UAS/UAV)	4	4	4	4	4
Total Based Aircraft	**71**	**74**	**76**	**80**	**84**
Annual Aircraft Operations					
Air Carrier	6	0	0	0	0
Air Taxi/Commuter	3,813	2,920	3,020	3,070	3,130
General Aviation (excl. UAS/UAV)	5,430	6,515	7,474	8,573	9,821
Military (excl. UAS/UAV)	2,882	2,900	2,900	2,900	2,900
UAS/UAV	780	880	980	1,110	1,280
Total Operations	**12,911**	**13,215**	**14,374**	**15,653**	**17,131**
Operations per Based Aircraft (GA)	**102**	**116**	**128**	**138**	**150**
Annual Instrument Operations					
Total Instrument Operations	3,327	3,436	3,737	4,070	4,454
Design Family Aircraft Operations					
A-II Turboprop	2,800	3,000	3,200	3,400	3,600
B-II Turboprop	19	1,000	1,040	990	960
B-I Jet	22	30	60	80	100
B-II Jet	62	80	110	140	200
C&D–I Jet	10	20	30	40	50
C&D-II Jet	50	60	80	100	120
C&D-III Jet	0	10	10	20	20
C-IV Turboprop (C-130)	150	160	180	200	220
B-IV Jet (C-17)	8	12	18	24	36
Design Aircraft	A/B-II Turboprop	B-II Turboprop	B-II Turboprop	B-II Turboprop	B-II Turboprop
Current Design Aircraft: Cessna Caravan 208 (Single Engine Turboprop) ARC A-II Future Design Aircraft: Saab 340 (Multi-Engine Turboprop) ARC B-II					

TABLE 3-25: EASTERN OREGON REGIONAL AIRPORT – SUMMARY OF FORECAST COMMERICAL ACTIVITY

DESCRIPTION	HISTORICAL	FORECAST			
	2014	2020	2025	2030	2035
Annual Passengers					
Enplaned Passengers	4,174	4,600	5,000	5,400	5,900
Annual Departures	1,107	465	465	445	420
Cargo					
Total Operations	1,024	1,040	1,040	1,040	1,040
Total Enplaned Cargo (Tons)	129	150	165	180	200
Total Deplaned Cargo (Tons)	183	210	235	260	290

Airfield Capacity

Airfield capacity is determined by calculating the airport's annual service volume. Annual service volume (ASV) is a measure of estimated airport capacity and delay used for long-term planning. ASV, as defined in FAA Advisory Circular (AC) 150/5060-5, Airport Capacity and Delay, provides a reasonable estimate of an airport's operational capacity. The ratio between demand and capacity helps define a timeline to address potential runway capacity constraints before they reach a critical point. If average delay becomes excessive (greater than 3 minutes per aircraft), significant congestion can occur on a regular basis, which significantly reduces the efficient movement of air traffic. ASV is calculated based on the runway and taxiway configuration, percent of VFR/IFR traffic, aircraft mix, lighting, instrumentation, the availability of terminal radar coverage and the level of air traffic control at an airport.

Factors that affect airfield capacity Include: weather conditions; airfield geometry; runway usage; aircraft fleet mix; percentage of touch-and-go operations; percentage of arrivals versus departures; airspace; etc.

Weather Conditions

Weather plays a vital role in the capacity of the runway system as a large percentage of aircraft delays are attributable to inclement weather.

Two weather conditions affect airport operations, Visual Meteorological Conditions (VMC) and Instrument Meteorological Conditions (IMC). VMC allows a pilot to operate the aircraft in visual conditions as long as they can maintain established cloud and visibility separation requirements. These requirements vary based on the airspace one is flying in. For EORA, which is Class D, visual operations require at least 3 statute miles of visibility. In addition, aircraft must remain no closer than 500 feet below, 1,000 feet above, and 2,000 feet horizontal distance from clouds. IMC describes weather conditions in which pilots are required to fly the aircraft solely by reference to instruments rather than visually. Airports are considered to be in IMC when the overall visibility is less than 3 statute miles and clouds are below a

1,000-foot ceiling. When an airport is in IMC, arrivals are normally limited to a specific runway that can accommodate instrument only approaches. This can include precision instrument approaches (those providing both horizontal and vertical guidance) and non-precision instrument approaches (those providing only vertical guidance).

Runways 7-25 and 11-29 can each accommodate visual operations during VMC. Runway 25 also has precision instrument approach capability while all Runways have non-precision instrument approach capability.

Wind Coverage

Wind affects runway system capacity, since it can have an impact on the operation of small, general aviation aircraft. Large, commercial service aircraft generally are not as susceptible to crosswinds as are the general aviation aircraft. Most general aviation aircraft are not permitted to take off or land if crosswinds exceed the aircraft manufacturer's specifications. Runways should therefore be oriented in the direction of the prevailing winds to provide maximum lift for takeoff. FAA criteria specify that the runway(s) orientation should provide at least 95% wind coverage. Wind roses constructed from historical weather observations and climatology data are used to calculate the percentage of wind coverage offered by individual or groups of runways. The current runway configuration at EORA provides greater than 95 percent wind coverage for all aircraft during all weather and IMC conditions.

Arrivals and Departures

The percentage of arrivals versus departures can affect an airport's overall capacity since a higher number of departures can typically be accommodated in a given period of time than arrivals.

Touch and Go Operations

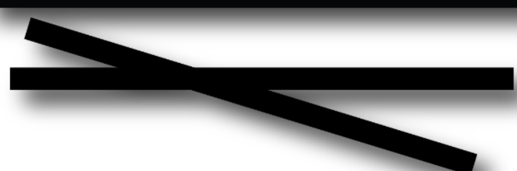
Touch and Go operations are primarily performed for pilot training by small, single- and twin-engine general aviation aircraft. These operations consist of an aircraft performing an approach to a runway, briefly touching down on the runway then immediately applying full throttle to depart the runway. Runways can accommodate a greater number of touch and go operations than any other type of operation. Therefore, the numbers of touch and go operations will impact an airport's overall operational capacity. The greater the numbers of touch and go operations, generally the greater the overall capacity of a particular runway or runway system. Touch and go operations at EORA comprise less than 20 percent of total airport operations and are not expected change significantly during the study period.

Annual Service Volume (ASV)

The initial step in developing Demand/Capacity Analysis is to conduct a preliminary assessment of the forecast demand levels relative to the airfield capacity. This analysis determines whether demand is approaching the airfield's capacity or Annual Service Volume (ASV) and whether a detailed capacity calculation is warranted. Calculating the ASV incorporates the Runway Use Configuration and Fleet Mix among many other variables.

Chapter 2 of the Airport Capacity and Delay Advisory Circular (AC 150/5060-5) details the procedure for calculating capacity and delay for long range planning. This circular provides a variety of typical runway configurations at airports in the United States. The first step in calculating the ASV is to select the configuration that most closely reflects the airfield configuration at the study airport. As discussed in the Inventory chapter, EORA has two active runways; Runway 7-25 is the primary runway equipped with both precision and non-precision instrument approaches. Runway 11-29 is a crosswind runway with non-precision instrument approach capability. The runway use diagrams in AC 150/5060-5 assume there is at least one runway equipped with a precision instrument approach, which is the case at EORA. The runway use configuration in the capacity and delay advisory circular that best fits EORA's runway layout is Diagram Number 9 as illustrated on **Table 3-26** below.

TABLE 3-26: EASTERN OREGON REGIONAL AIRPORT – RUNWAY USE DIAGRAM NUMBER 9

Runway Configuration	Mix Index	Hourly Capacity Ops/Hour		Annual Service Volume
	% (C + 3D)	VFR	IFR	Ops/Year
	0 to 20	98	59	230,000
	21 to 50	77	57	200,000
	51 to 80	77	56	215,000
	81 to 120	76	59	225,000
	121 to 180	72	60	265,000

Source: FAA AC 150/5060-5, 2016

The second component needed to calculate the ASV is the fleet mix or mix index. This is the percentage of aircraft operations by multi-engine aircraft in Aircraft Class C (maximum certificated takeoff weights between 12,500 pounds and 300,000 pounds) and Aircraft Class D (maximum certificated takeoff weights greater than 300,000 pounds). The formula for determining aircraft mix is the percentage of Class C aircraft plus three times the percentage of Class D aircraft or % (C+3D). The larger and heavier Class D aircraft have a greater impact on airfield capacity because the wake turbulence they generate can affect trailing aircraft, which requires increased separation during operations; increased separation reduces capacity.

Table 3-27 presents the breakdown of the Aircraft Classifications used in determining wake turbulence standards and the Aircraft Mix Index. Aircraft mix (or Mix Index) is the relative percentage of operations conducted by each of the four classes of aircraft (A, B, C, and D). The (C+3D) Mix Index at EORA is less than 20 percent of total activity.

TABLE 3-27: EASTERN OREGON REGIONAL AIRPORT - AIRCRAFT CLASSIFICATIONS

Aircraft Class	Maximum Certificated Takeoff Weight (lbs.)	Number of Engines	Wake Turbulence Classification
A	12,500 or less	Single	Small (S)
B		Multi	
C	12,500 - 300,000	Multi	Large (L)
D	Over 300,000	Multi	Heavy (H)

Sources: FAA Advisory Circular 150/5060-5, Airport Capacity and Delay (with changes), and Century West Analysis

For long-term planning purposes, the FAA estimates the annual capacity (ASV) for EORA is approximately 230,000 operations; hourly capacity is estimated to be 98 operations during visual flight rules (VFR) conditions and 59 operations during instrument flight rules (IFR) conditions. Although these estimates assume optimal conditions (airport traffic control, radar, etc.), they provide a reasonable basis for approximating existing and future capacity:

Existing Capacity: 12,911 Annual Operations / 230,000 ASV = 5.6% (demand/capacity ratio)

Future Capacity: 17,131 Annual Operations / 230,000 ASV = 7.4% (demand/capacity ratio)

The average delay per aircraft would be expected to remain below three minutes throughout the planning period based on these ratios. The FAA recommends that airports proceed with planning to provide additional capacity when 60 percent of ASV is reached. The updated aviation activity forecasts indicate both annual and peak hour activity is projected to remain well below the 60 percent threshold during the planning period.

Chapter 4 – Unmanned Aircraft Systems Evaluation

Chapter 4 – Unmanned Aircraft Systems Evaluation

This chapter was prepared by the Pendleton UAS Range.

Introduction

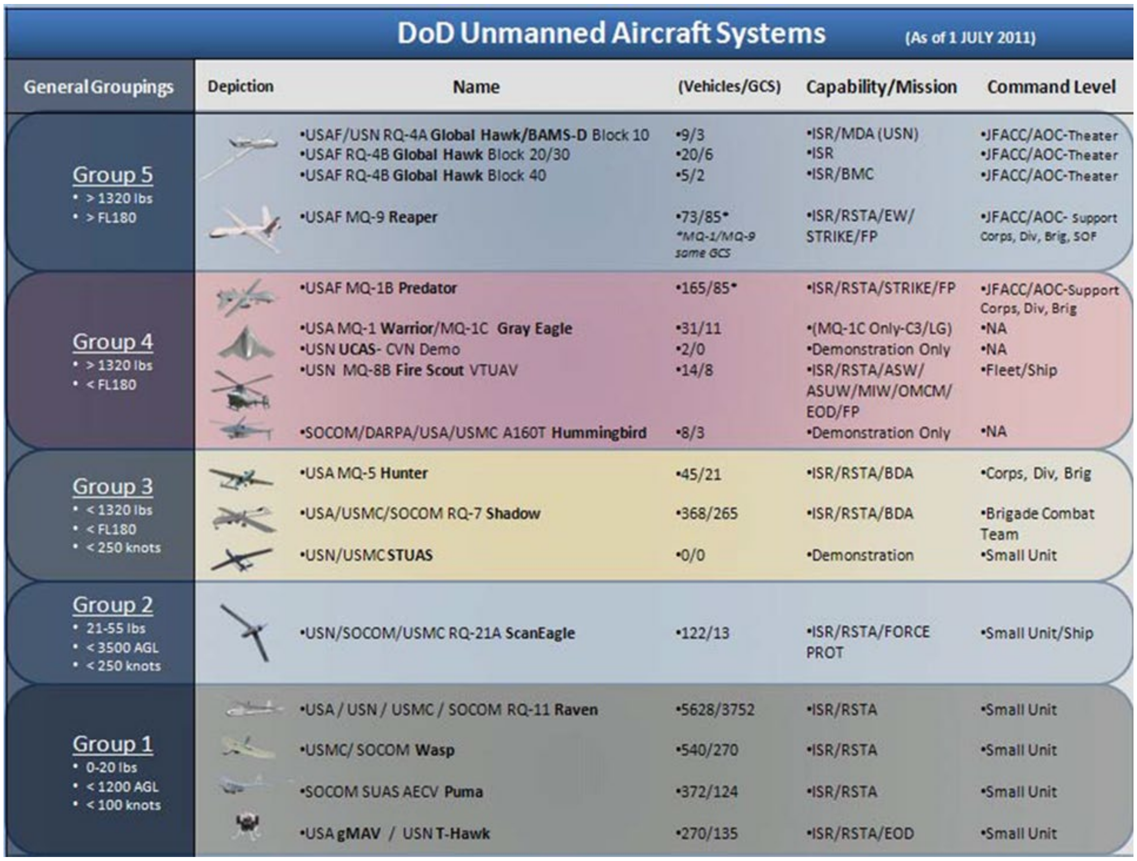
Pendleton UAS Range

The Pendleton UAS Range (PUR) is part of the Pan-Pacific UAS Test Range Complex (PPUTRC), led by the University of Alaska. The PPUTRC is one of six official FAA UAS test sites in the United States. The test ranges are chartered to manage and support a variety of UAS activities to include: Range Support/Management, Engineering, and Flight Test efforts with the goal of integrating UAS into the National Airspace System (NAS).

The PUR is based at the Eastern Oregon Regional Airport (KPDT) and encompasses 14,000 square miles of airspace in northeastern Oregon. The PUR is dedicated to supporting UAS manufacturers and operators in developing safe, effective processes and procedures that have all necessary approvals for UAS operations in the NAS. The PUR Range Management office at KPDT manages all UAS operations on the PUR in support of research, regulatory development, and commercialization projects.

The strategic vision of the PUR is to develop a diverse, high-tech UAS industry base at KPDT, providing a variety of UAS services to Original Equipment Manufacturers (OEM's) including FAA type-certification.

FIGURE 4-1: UAS GROUPS



DoD Unmanned Aircraft Systems (As of 1 JULY 2011)

General Groupings	Depiction	Name	(Vehicles/GCS)	Capability/Mission	Command Level
Group 5 • > 1320 lbs • > FL180		•USAF/USN RQ-4A **Global Hawk/BAMS-D** Block 10 •USAF RQ-4B **Global Hawk** Block 20/30 •USAF RQ-4B **Global Hawk** Block 40	•9/3 •20/6 •5/2	•ISR/MDA (USN) •ISR •ISR/BMC	•JFACC/AOC-Theater •JFACC/AOC-Theater •JFACC/AOC-Theater
		•USAF MQ-9 **Reaper**	•73/85* *MQ-1/MQ-9 same GCS	•ISR/RSTA/EW/ STRIKE/FP	•JFACC/AOC- Support Corps, Div, Brig, SOF
Group 4 • > 1320 lbs • < FL180		•USAF MQ-1B **Predator**	•165/85*	•ISR/RSTA/STRIKE/FP	•JFACC/AOC-Support Corps, Div, Brig
		•USA MQ-1 **Warrior**/MQ-1C **Gray Eagle** •USN **UCAS**- CVN Demo •USN MQ-8B **Fire Scout** VTUAV	•31/11 •2/0 •14/8	•(MQ-1C Only-C3/LG) •Demonstration Only •ISR/RSTA/ASW/ ASUW/MIW/OMCM/ EOD/FP	•NA •NA •Fleet/Ship
		•SOCOM/DARPA/USA/USMC A160T **Hummingbird**	•8/3	•Demonstration Only	•NA
Group 3 • < 1320 lbs • < FL180 • < 250 knots		•USA MQ-5 **Hunter**	•45/21	•ISR/RSTA/BDA	•Corps, Div, Brig
		•USA/USMC/SOCOM RQ-7 **Shadow**	•368/265	•ISR/RSTA/BDA	•Brigade Combat Team
		•USN/USMC **STUAS**	•0/0	•Demonstration	•Small Unit
Group 2 • 21-55 lbs • < 3500 AGL • < 250 knots		•USN/SOCOM/USMC RQ-21A **ScanEagle**	•122/13	•ISR/RSTA/FORCE PROT	•Small Unit/Ship
Group 1 • 0-20 lbs • < 1200 AGL • < 100 knots		•USA / USN / USMC / SOCOM RQ-11 **Raven**	•5628/3752	•ISR/RSTA	•Small Unit
		•USMC/ SOCOM **Wasp**	•540/270	•ISR/RSTA	•Small Unit
		•SOCOM SUAS AECV **Puma**	•372/124	•ISR/RSTA	•Small Unit
		•USA **gMAV** / USN **T-Hawk**	•270/135	•ISR/RSTA/EOD	•Small Unit

UAS Airside and Landside Activities

The Unmanned Aircraft Systems (UAS) industry is a rapidly expanding market. The domestic regulatory environment is dynamic as the FAA continues to work through the challenges of integration between manned and unmanned aviation in the National Airspace System. UAS technology is also evolving rapidly and the PUR is working to integrate infrastructure and airspace plans into future development and accommodate the wide range of needs across both UAS and manned platforms in support of the PUR strategic vision.

UAS needs vary greatly between the many different types, sizes and functions of platforms, and associated support equipment. Although not totally inclusive, **Figure 4-1** generally describes the different types and categories of UAS platforms, organized into basic groups. Commercial industry generally falls into these categories as well. Group 2 & 3 are dominating the commercial market, mostly driven by current FAA restrictions and cost; while the Department of Defense (DoD) and other government agencies are operating UAS platforms across the full spectrum of size and capability. Due to the recent FAA Part 107 ruling easing restrictions on non-commercial use of small UAS (<55 lbs.) by hobbyists, the number of Group 1 UAS in the NAS has increased dramatically. The general infrastructure and support requirements for each of group are laid out in this section.

UAS Airside Facility Requirements

Group 1 Infrastructure Requirements:

RUNWAY REQUIREMENTS

None. Hand launched / recovered.

AIRFIELD SUPPORT SERVICES

General Services

Group 1 vehicles are small, mobile and likely will not require operations into, or out of the airport. Support requirements may include a Mobile Operations Center (MOC), radio communications equipment, crew shelter, data-processing space, training room and secure storage locations.

Facilities

None.

Office / Administrative Space

Customers utilizing Group 1 platforms will likely utilize office space for data-processing, training and secure equipment storage. Current space at Eastern Oregon Regional Airport (EORA) include:

- Office: Single office available in terminal
- Training / Storage Room: Single training / storage area available in terminal, adjacent to office space (old baggage claim area).

The current office and training / storage area may be sufficient to support one customer at a time. However, additional MOC storage areas will be required (approx. 20' x 40'). Customer demand will generate the need for additional office and storage locations at the EORA.

Group 2 & 3 Infrastructure Requirements:

RUNWAY REQUIREMENTS

There are a wide range of requirements for Unmanned Aircraft platforms and associated launch, recovery and control mechanisms ranging from pneumatic launchers, skyhook recovery, to runway and net system recovery. The infrastructure plans for PUR at the EORA include accommodations for these varying requirements. Typical equipment support and footprints for Group 2 & 3 platforms are described below. **Figure 4-2** shows an example of a UAS launch. **Figure 4-3** shows an example of a portable UAS capture system.

FIGURE 4-2: INSITU SCAN EAGLE LAUNCH

FIGURE 4-3: ARCTURUS T-20 PORTABLE CAPTURE SYSTEM

Launch / Recovery

- Pneumatic Launch and Skyhook recovery
- Bungee or hand launch, hard packed surface recovery
- Pneumatic launch and runway recovery

Typical Footprint:

Launch:

- Stowed
    - Length: 17.83 ft.
    - Width: 7.25 ft.
    - Height: 6.42 ft.
- Deployed
    - Length: 22 ft.
    - Width: 7.25 ft.
    - Height: 8 ft.

Transport:

- Typically hitch-mounted, or trailer transport
- Weight: Ranging between 200 - 4,200 lbs.

Recovery:

Runway:

- Condition:
    - Hard-packed, paved, gravel or dirt
    - Less than 1000 ft.

Net Capture:

- Typically off airport

Sky Hook:

- Stowed:
    - Length: 19 ft.
    - Width: 7.2 ft.
    - Height: 6.25 ft.
- Deployed:
    - Length: 28.75 ft.
    - Width: 17.5 ft.
    - Height: 58 ft.

Fuel Storage, Handling & Limitations

Typical Fuel Requirements:

- JP-5 or JP-8 fuel
- Hybrid Power System Propane/Rechargeable Battery
- Fuel cell
- Battery operated

AIRFIELD SUPPORT SERVICES

General Services

Group 2 & 3 systems will require airfield services such as fuel, UAS pad maintenance, utility support (internet, power, trash, sewer, etc.), transportation, security and labor associated with safety, compliance, and administration support. Memorandums of Agreement (MOA) will be required with the Air Traffic Control Tower (ATCT) for airfield movement and airspace coordination / approval.

Facilities

Fifteen UAS pads are located on the airport, adjacent to taxiways Foxtrot and Golf. Each UAS pad is equipped with 115/208V single-phase, 60 Hz AC electrical power, water, and fiber internet access. These UAS pads are able to accommodate a wide range of trailers or other support equipment to meet the needs of current and future UAS customers. A typical Mobile Operations Center (MOC) as shown in **Figure 4-4 and Figure 4-5**: Many Group 2 systems utilize an MOC to support operations in the field.

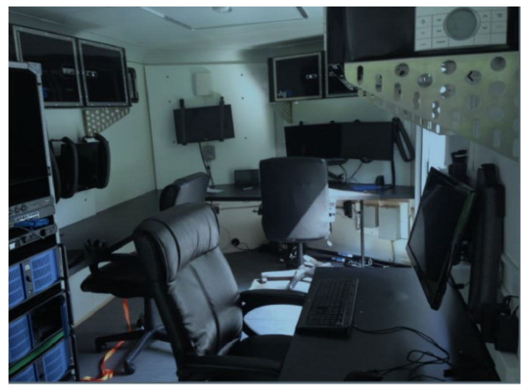
The PUR MOC is available to range users and includes:

- Length: 25 ft.
- Width: 8 ft.
- Computer Workstations: 4
- VHF Voice Radio
- Pan and Zoom Camera
- Video Matrix Switch
- Four, 55” inch LED Screens
- Two, ADS-B Receivers and IPad Displays
- Two Cellular WiFi Hotspots, Printer
- Rack Mounted General-Purpose Computer

- Rack Mounted 900 MHz- 8 GHz Spectrum Analyzer
- Back-up power (24VDCbattery)
- Generator for normal power/Able to connect to shore power
- Heat/AC/Shower/Toilet
- External lighting
- Dodge Ram 2500 Mega Cab tow vehicle

FIGURE 4-4: MOC TRAILER(TYPICAL)

FIGURE 4-5: MOC TRAILER INTERIOR



Office / Administrative Space:

Similar to Group 1, Group 2 & 3, UAS customers will require office space for data-processing, administration support, training, and secure storage.

The current office / storage space located in the EORA terminal would likely meet the needs for one customer at a time (accommodating approximately 3-5 personnel per operation), but additional customer demand will generate the need for increased office and storage space at the EORA.

A 9,600 square-foot, two-bay, multipurpose hangar with an open floorplan is under construction to meet immediate and future needs of both manned and unmanned aviation (north of TWY Delta). This hangar is outfitted with restrooms, HVAC, 480V three-phase, 60 Hz AC power, and office space. By designing the hangar to be dual-purpose (large enough to fit a King Air type aircraft), it will allow the highest level of flexibility while the UAS industry evolves. This new construction will be ready for occupancy in 1Q2017.

Group 4 & 5 General Infrastructure Requirements:

RUNWAY REQUIREMENTS

As a general rule, Group 4 & 5 UAS operate very similarly to manned aviation and require very similar infrastructure and equipment support.

AIRFIELD SUPPORT SERVICES

General Services

Large UAS will require airfield services such as towing, refueling / de-fueling, deicing, power, security, hangar space, etc. MOA's will be required with the ATCT for airfield movement and airspace coordination / approval.

Fuel Storage, Handling & Limitations

Typical Fuel Requirements:

– Primary - MIL-T-83133, JP-8, or JP-8+100.

– Alternate - MIL-T-5624, JP-5, or additivized TS-1

Facilities

Hangars

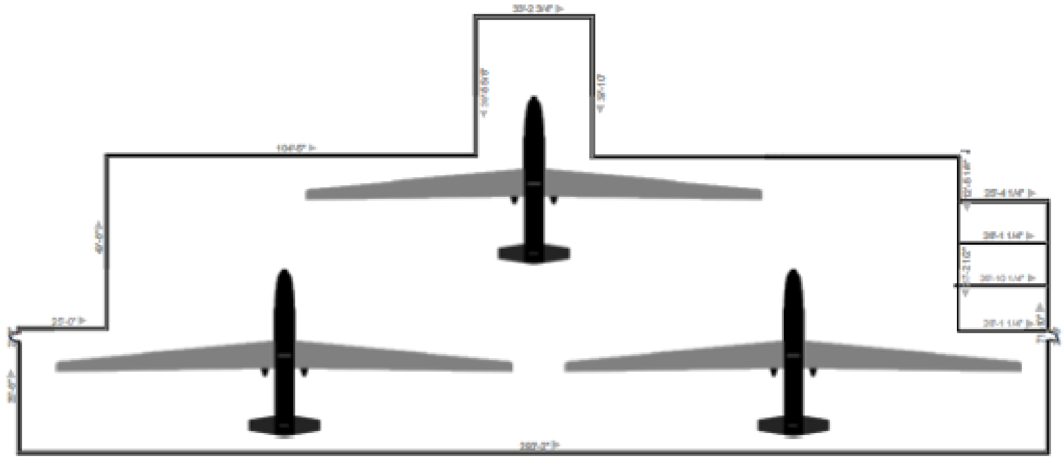
For scaling purposes, we utilized a Global Hawk platform as an example of infrastructure requirements for a large, Group 5 UAS platform.[1] **Figure 4-6** shows typical Large UAS dimensions. **Figure 4-7** shows an example of a UAS hangar layout.

FIGURE 4-6: GLOBAL HAWK DIMENSIONS

	RQ-4A	RQ-4B
Wing Span (ft)	116.2	130.9
Length (ft)	44.4	47.6
Height (ft)	15.2	15.4
Verticle Clearance (in)	19.5	20.65
Tread (ft)	10.6	21.1

[1] Technical Manual 1Q-4(R) A-2-DB-1, 22 April 2008, Version 07.12.001

FIGURE 4-7: EXAMPLE HANGAR PLAN



Office / Administrative Space

The administrative footprints for large platforms are significant with personnel office space ranging from 10-20 offices with a conference room, break-room, and bathrooms. Space located above a large hangar or a small-detached building would meet the needs of required administrative personnel.

Building-based Operations Center

Depending on the owner / operator, Group 4 & 5 UAS platforms utilize command and control stations that may be building-based, or housed within mobile ground stations. The DoD developed mobile ground stations to support overseas locations and separated the Mission Control Element (MCE) and Launch and Recovery Element (LRE) functions. These stations are typically housed in commercially available trailers outfitted with UHF and VHF radio links, a C-band line of sight data link, and KU-band satellite data links. Other users, such as National Aeronautics and Space Administration (NASA), utilize a building-based operations center where ground, support, and communications equipment are permanently installed. **Figure 4-8** shows a typical UAS operations center.[2]

[2] Northrop Grumman Corporation, Pake Chin, Sep 2013

FIGURE 4-8: OPERATIONS CENTER

Summary:

As identified in this section, there is a wide variation of infrastructure, equipment and support service requirements across the various types and sizes of Unmanned Aircraft Systems. Current infrastructure at the EORA will support the immediate needs of customers flying at the PUR. Based on current and forecasted UAS operations tempo (OpsTempo), we believe the Phase I infrastructure and new hangars will support a number of potential flight operations for the next two to five years. The additional hangar construction and office / storage space would be highly attractive to both the UAS and manned aviation industries; both as an immediate and future need at the airport. Phase I & II of the PUR infrastructure execution will likely be driven by customer demand. The evolving FAA regulatory environment has a direct impact on customer demand at the PUR, and thus OpsTempo.

Current and Future UAS Airspace Approvals / Requirements

Approval for operation in KPDT Class Delta airspace currently include Shadow (RQ-7) operations from the Oregon Army National Guard; Arcturus T-20, Tigershark, RMAX and FAZER operations from the north end of Taxiway Golf or the UAS pads. A copy of the Army Letter of Agreement (LOA) and Certificate of Authorizations (COA), and approved PUR COA for UAS within KPDT Class Delta airspace is included in **Appendix C**. Additional approvals are in-place to allow for day and night operations for large and small UAS operating in Class Echo and Golf airspace, from surface to 9,999 Ft MSL. All UAS operations require that the vehicle remain in visual contact by an observer. If the UAS mission plan will take the vehicle beyond the line-of-sight of the observer, daisy-chaining of observers is allowed, or a chase aircraft must follow the UAS and maintain direct radio contact with the UAS Pilot-in-Command.

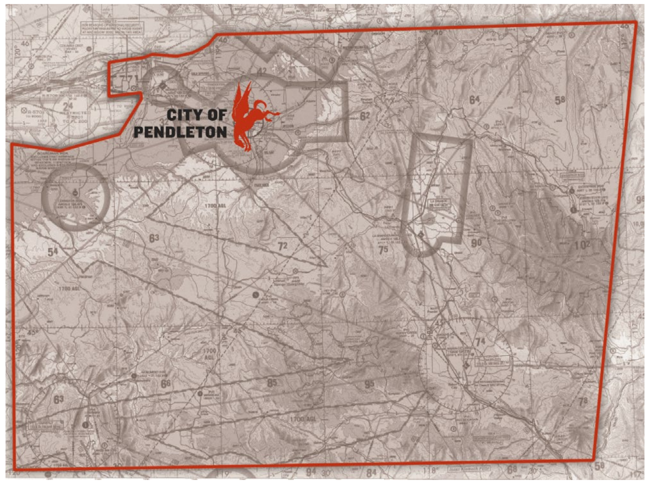
Currently, UAS operations in the class Delta airspace do not have an impact on arriving and/or departing VFR and/or IFR traffic. Segregation by ATCT, and management of the range schedule are the current risk mitigation approach used for traffic confliction between manned and unmanned platforms. Additionally, lost-link contingency routes are planned for all UAS activity on the range; these routes define what the UAS will do in the event the command and control data link is lost and are designed such that a UAS in a lost-link situation will not over-fly approach or departure route, population centers, etc. as it returns to base. These contingency plans are briefed to ATCT personnel prior to every UAS mission in class Delta airspace.

If the air traffic control tower were to close, UAS operations are permitted in Class E airspace with proper approval from the FAA, either through a certificate of authorization, Section 333 Exemption, and as of August 2016, small UAS operations for commercial use are authorized under CFR Part 107. Section 333 Exemption of the FAA Modernization and Reform Act of 2012 (FMRA), grants the Secretary of Transportation the authority to determine whether an airworthiness certificate is required for UAS to operate safely in the National Airspace System (NAS). The Section 333 Exemption process provides operators who wish to pursue safe and legal entry into the NAS a competitive advantage in the UAS marketplace, thus discouraging illegal operations and improving safety.[3] CFR Part 107 allows operators of small, commercial UAS to obtain a 'Remote Pilot Certificate' (RPC) by taking a written Aeronautical Knowledge test, similar to a private pilot written test. Once a commercial operator has obtained an RPC, the may operate a small UAS in the NAS; if operations will be in controlled airspace, the operator must coordinate with local ATC before commencing operations. ATC's primary responsibility is to separate air traffic near an airport. The smaller the aircraft is, the harder it is for pilots to see-and-avoid other aircraft. The importance of having and maintaining an active air traffic control tower is critical for the safety of both manned and unmanned aircraft.

Figure 4-9 shows the UAS operations area surrounding Pendleton.

[3] Federal Aviation Administration; Section 333 <https://www.faa.gov/uas/legislative_programs/section_333/>

FIGURE 4-9: PUR OPERATIONS AREA

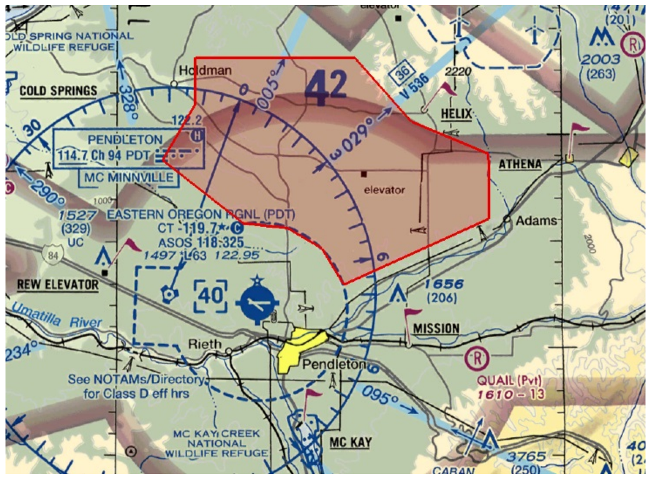


UAS operations are approved as outlined below:

1. Inside KPDT Class Delta airspace:
    a. Altitude: at or below 4,000ft MSL (as assigned by KPDT ATCT)
    b. UAS operations allowed with clearance from PDT ATCT
        - KPDT ATCT personnel attend Flight Readiness Reviews/Preflight briefings before any UAS operations in KPDT Class Delta
    c. NW, NE, and SW Holding Points (as depicted in the LOA) are established and used as directed by KPDT ATCT. UAS operators will comply with all ATC instructions while operating in KPDT Class Delta.
    d. NOTAM's will be submitted for UAS operations being conducted in KPDT Class Delta.
2. Operations in North OPAREA outside Class Delta airspace:
    a. Altitude: at or below 4,000 ft. MSL (as assigned by Pasco TRACON)
    b. Communications will be with PDT ATCT
3. Operations between KPDT Class D and R-5701 (Army National Guard):
    a. Altitude: at or below 4,000 ft. MSL (as assigned by Pasco TRACON)
    b. Communications will be with KPDT ATCT.
4. Operations between KPDT and PUR airspace:
    a. The PUR includes 14,000 square miles of airspace ranging from surface to 18,000.
5. The mixing of manned and unmanned traffic within Class D airspace during launch and recovery operations is approved.

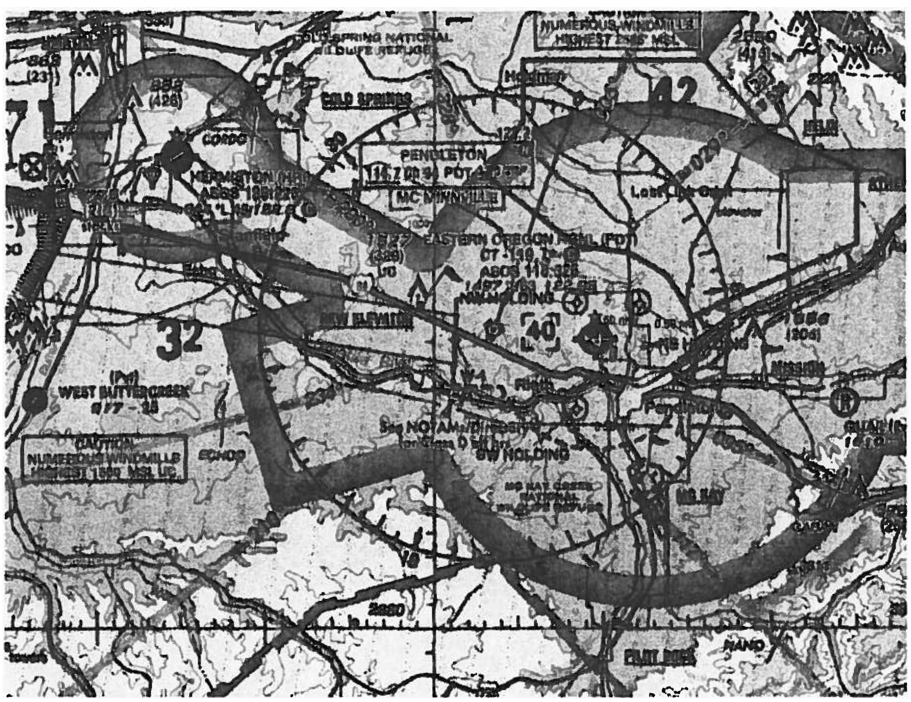
Figure 4-10 shows the North Operations Area

FIGURE 4-10: NORTH OPERATIONS AREA (OPAREA)



AIRSPACE MANAGEMENT:

FIGURE 4-11 SHOWS KPDT ON A SECTIONAL CHART.FIGURE 4-11: KPDT



Future airspace management between manned and unmanned aircraft is part of the FAA's NextGen program, including Automatic Dependent Surveillance-Broadcast (ADS-B) technology.

Automatic Dependent Surveillance–Broadcast (ADS-B) is a precise satellite-based surveillance system. ADS-B Out uses GPS technology to determine an aircraft's location, airspeed and other data, and broadcasts that information to a network of ground stations, which relays the data to air traffic control displays and to nearby aircraft equipped to receive the data via ADS-B In. Operators of aircraft equipped with ADS-B In can receive weather and traffic position information delivered directly to the cockpit. Range operations are governed by current ATCT LOA restrictions (very similar to the Guard LOA).[4]

ADS-B will be mandated for all aircraft starting in 2020 and available in the size of a business card (today), accommodating the minimal payload capacity on small manned and/or unmanned aircraft. This technology will serve as a tool for both manned aviators in the sky and controllers on the ground to all detect-and-avoid each other.

We do not anticipate the UAS operational tempo driving a need for change to airport air traffic flow for the foreseeable future (next 5-10 years). The procedures described above will accommodate current and future UAS testing at the PUR, and Army ANG training operations. Assumptions include no significant increase to Army training requirements and no large (Group 4 & 5) UAS vehicles as a tenant to KPDT. Large group 4 and 5 fixed-wing UAS vehicles, as well as manned, flying test bed aircraft require a large runway (5,000-7,500 feet in length) for takeoff and landing and associated support infrastructure / equipment. Large group 4 and 5 rotary-wing, vertical take-off and landing (VTOL) UAS and manned, rotary-wing flying test bed aircraft can operate from existing ramp and apron areas. The PUR is expecting that group 4 fixed wing UAS operations will commence in February 2017, and group 5 rotary-wing UAS operations will commence in KPDT class Delta in the summer of 2017. Additionally, the PUR has been in discussion with clients interested in flying manned test-bed aircraft (CRJ700 and similar) in support of development work for UAS applications.

Group 2 & 3 UAS platforms can utilize unused portions of KPDT runways and taxiways; taking advantage of current air traffic separation / segregation techniques currently employed by the ATCT.

[4] https://www.faa.gov/nextgen/programs/adsb/

UAS Landside Facility Requirements

Current and future UAS infrastructure support requirements are captured in the EORA's Phase I, II, and III plans for the Pendleton UAS Range. Phase I is complete, while Phase II and III development will be implemented upon customer demand. The UAS industry is still an evolving market so plans include maximum flexibility, accommodating both manned and unmanned aviation industries until the UAS market becomes more established and self-sustaining.

Infrastructure:

The available EORA paved surfaces include: UAS Strip 16/34 (currently Taxiway Golf): 60' x 4,300', Runway 7/25 (Main): 150' x 6,301', and Runway 11/29: 11' x 5,581'. The Class Delta airspace is managed by a UAS experienced ATCT that coordinates closely with both PUR and the established Army National Guard UAS unit operating the Shadow (RQ-7) safely and routinely. The experienced range management team onsite at the PUR is led by a team of expert industry professionals across manned, unmanned, and FAA backgrounds that ensure operations are conducted in a safe and cost-effective manner. **Figure 4-12** shows the airport diagram at Eastern Oregon Regional Airport.

Insert Figure 4-12: KPDT Airport Diagram

Phase I:

The airport provides a 2,800-foot UAS dedicated strip and a full-service UAS operating area with available fiber connections. The EORA maintains a dedicated UAS Operations Area with 15, 50'x50' work areas (UAS Pads) adjacent to the dedicated, paved UAS strip. These customer work areas were designed to accommodate UAS trailers, MOCs, crew operations, etc. and wired for 240v, 50amp and 120v, 30amp electrical outlets as well a water hookups. Secure Fiber Gigabit hardline access with 100mbps standard speed is also provided. This can be upgraded to full Gigabit speeds that tie into one of the fastest data pipelines in the State of Oregon, allowing for real-time cloud-based data uploads and computing.

Phase I build out in support of the Pendleton UAS Range includes some infrastructure and equipment specific to the needs of unmanned aircraft (i.e. UAs launch/recover pads), but the majority of plans accommodate the needs of both manned and unmanned aircraft. This will maximize infrastructure support at the airport while the UAS market continues to evolve (growth dependent heavily on FAA regulation development).

Phase II:

Phase II includes hangar construction on the southwest corner of the airfield, near the existing T-hangars. This hangar is nearing completion and is scheduled to be occupied by a group 5 UAS starting in 2Q2017.

Phase III:

Phase III addresses long-term development needs for UAS facilities. This includes an industrial park area with vehicle access from the west; adequate space for construction of a new UAS hangars and buildings; and construction of a new UAS launch and recovery runway.

Figure 4-13 is the Pendleton UAS Range Phase I, II, and III.

Insert Figure 4-13: UAS Development Phase I, II, and III

Chapter 5 – Airport Facility Requirements

Chapter 5 – Airport Facility Requirements

Note: The airside facility requirements evaluations addressed design standards based on the actual current and historic airport activity for Runway 7/25, 11/29, and the airfield's major taxiway system. This evaluation was consistent with the City of Pendleton's desire to maintain existing airfield capabilities whenever feasible. The evaluation of historically-applied ARC C–III standards for Runway 7/25 presented in this chapter reflects this approach. The status of FAA funding eligibility for Runway 11/29 was undetermined when the facility requirements analysis was completed.

FAA review and comment regarding the recommended airport design standards and eligibility of Runway 11/29 occurred after the master plan analyses were completed, during review of the draft final airport master plan. The FAA review produced several changes to the applicable design standards that are reflected on the final ALP drawings presented in Chapter 8. The applicable FAA design standard dimensions are provided on Sheet 2 (Airport Data Sheet) of the ALP drawing set. It is noted that the City may opt to maintain existing facility capabilities and the issue of design standard compliance will focus primarily on FAA funding eligibility. The ultimate FAA eligibility decisions are typically made during the design phase of individual projects.

Introduction

The evaluation of airport facility requirements uses the results of the inventory and forecasts contained in Chapters Two and Three, as well as established planning criteria, to determine the future facility needs for the airport through the current twenty-year planning period. **Airside** facilities include runways, taxiways, navigational aids and lighting systems. **Landside** facilities include hangars, terminal and fixed base operator (FBO) facilities, aircraft parking apron(s), and aircraft fueling. Support items such as surface access, automobile parking, security, and utilities are also examined. All airfield items are evaluated based on established Federal Aviation Administration (FAA) standards.

The facility requirements evaluation is used to identify the adequacy or inadequacy of existing airport facilities and identify what new facilities may be needed during the planning period based on forecast demand. Potential options and preliminary costs for providing these facilities will be evaluated in the Airport Development Alternatives (Chapter Seven), to determine the most cost effective and efficient means for meeting projected facility needs.

Eastern Oregon Regional Airport – Functional Role

Eastern Oregon Regional Airport performs several functional roles that extend beyond general aviation and commercial aviation. The historical use of the airport by large military and civilian aircraft is reflected in the size and capabilities of its existing airfield facilities. In addition to the airport's history of accommodating military aircraft, the facility is uniquely capable of supporting regional emergency response operations requiring large aircraft.

The City of Pendleton's priority is to preserve the current level of functional capability for the airport, to the greatest extent feasible. As the owner of a regional airport, the City recognizes that its facilities are unique and not easily duplicated among eastern Oregon airports. While the significance of this may have a limited effect on general aviation activity, it is critically important when considering the airport's broader role as a key element in the state, regional, and national transportation infrastructure.

With this in mind, the City of Pendleton would like to maintain the "existing" design standards reflected on the 2002 Airport Layout Plan (ALP) for the primary runway, major taxiways, and areas on the main apron used by transport category aircraft. Recent projects completed on Runway 7/25 and several major taxiway sections provide many years of service before rehabilitation. Employing a "maintenance only" mode for these facilities is consistent with the City's goal of preserving the overall function of the airport and the FAA's long established and ongoing facility investment. Based on forecast activity, no expansion beyond current capabilities is required or recommended for these facilities.

It is noted that the precision instrument approach capabilities for Runway 7/25 require the same dimensions for several protected areas such as the width of the runway object free area and primary surface, and runway protection zones, regardless airport reference code (ARC).

Maintaining the existing ADG III design standards for Runway 07/25 and the associated facilities provides a reasonable approach that will allow the airport to maintain adequate safety margins for all activity.

Military Activity

Current military activity at Eastern Oregon Regional Airport is primarily related to the Oregon Army National Guard (OANG) facility, which coordinates training operations across multiple military branches. Military air traffic includes locally-based large helicopters and unmanned aircraft systems (UAS), and transient helicopters and transport category fixed-wing aircraft. The large fixed-wing aircraft include the Lockheed C130 Hercules (ARC: C-IV) and the recent addition of Boeing C-17 Globemaster aircraft (ARC: B-IV). The majority of this aircraft activity is generated from Joint Base Lewis-McChord, south of Tacoma, Washington, and the Idaho Army National Guard from its base in Boise, Idaho in support of paratrooper training with the OANG in Pendleton.

As noted in the updated aviation activity forecasts, annual military fixed wing (airplane design group IV) operations are forecast to increase from approximately 160 to 260 operations by 2035. Although the forecast level of ADG IV activity does not meet the FAA's definition of "substantial use" (500 annual transient operations), it clearly illustrates established use by large aircraft that is important to consider in future airfield planning.

Emergency Response

Cascadia subduction zone seismic events have been identified as Oregon's greatest natural threat-one that could result in potentially catastrophic damage and long-lasting disruption of normal activities. As the research and understanding of the potential risks associated with a Cascadia event is becoming more detailed, it is evident that the effects could be severe and widespread. Recovery from events of this scale may be measured in decades, not months or years.

A recent study[1] analyzing potential impacts from a high magnitude earthquake noted that slight to moderate damage to infrastructure is expected. The potential for changes in underlying soils suggests that key transportation facilities including airports, may be at risk. Among the characteristics of this type of seismic event is soil liquefaction, which occurs when soil becomes dangerously unstable as water is moved through grains of soil under pressure during the shaking of the earthquake. Liquefaction can result in ground settlements. Oregon's largest airport, Portland International Airport is vulnerable to soil liquefaction and flooding due to its low elevation and direct exposure to the Columbia River. A key element of response planning is developing a system of assets that can be used to maintain critical transportation links when damaged facilities are out of service.

The **Oregon Resilience Plan – Reducing Risk and Improving Recovery for the Next Cascadia Earthquake Tsunami,**[2] completed in 2013, provides analysis of key challenges, including the potential impact on Oregon's infrastructure and outlines a basic strategy for post disaster response coordination. The overall expectation is that critical infrastructure components in coastal and western areas of the

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[1] Cascadia Subduction Zone Earthquakes: A Magnitude 9.0 Earthquake Scenario (2013 Update), Cascadia Region Earthquake Workgroup (CREW), Federal Emergency Management Administration (FEMA), and National Earthquake Hazard Reduction Program (NEHRP)

[2] The Oregon Resilience Plan – Reducing Risk and Improving Recovery for the Next Cascadia Earthquake and Tsunami. Oregon Seismic Safety Policy Advisory Commission (OSSPAC) February 2013.

affected states will suffer complete loss or significant damage during a major event. The ability to respond will require coordinated use of assets outside the areas of damage. The report notes that eastern Oregon will play an important role in a response strategy:

"The Eastern zone where light damage would allow rapid restoration of services and functions, and where communities would become critical hubs for the movement of response recovery and restoration personnel and materials for the rest of the state."

Eastern Oregon Regional Airport has the longest fully instrumented runways in northern Oregon, east of Portland International Airport. The airport is uniquely capable of accommodating large military and commercial transport aircraft used in emergency response and relief operations.

The analysis of eastern Oregon airports contained in the 2013 report was limited to Redmond Municipal Airport, which is identified as primary FEMA facility. Although the direct flight distance between Pendleton and Portland is 57 miles greater than the distance between Redmond and Portland, the facilities available and the established military capabilities at Eastern Oregon Regional Airport, combined with direct access to the interstate highway system, suggests that it could perform a valuable role in a major response effort.

The report included several recommendations for short-term and long-term goals that will create an effective response strategy:

- Complete and updated inventory of assets, which could be used during emergencies;
- Complete a statewide evaluation, assessment, and gap analysis, including 97 public use airports in Oregon and the soil liquefaction vulnerability of Portland International Airport;
- Refine and gain consensus for the strategy (for an incremental program for achieving resilience in western Oregon)

It is anticipated that the detailed analysis of existing assets, including Eastern Oregon Regional Airport, will be reflected in updated emergency plans moving forward.

Despite the dire nature of a potential Cascadia event, it is important to note that emergency planners are not currently engaged in a program of building system redundancy or response capabilities where they do not currently exist. The potential scale of the problem is too great to provide a response equal to the need. The strategic preservation of regional system redundancy provides additional rationale to support maintaining the existing dimensions and operational capabilities of Eastern Oregon Regional Airport.

Facility Requirements Evaluation

This chapter evaluates facility requirements from two perspectives: (1) conformance of existing facilities to Federal Aviation Administration airport design and airspace planning standards; and (2) new demand-based facility needs that reflect the updated aviation activity forecasts presented in Chapter Three.

The evaluation of demand-driven items will reflect in gross numbers, new facility needs such as runway length requirements, hangar spaces, and aircraft parking positions based on forecast demand and the needs of the design aircraft. Items such as lighting and navigational aids are evaluated based on the type of airport activity, airport classification, and capabilities.

Conformance Review

The evaluation of conformance to FAA airport design standards, depicted as "existing" on the current FAA-approved Airport Layout Plan (ALP), is updated to reflect the current analysis of the design aircraft and the associated planning assumptions described later in this chapter. Airspace planning criteria depicted as "ultimate" on the current FAA-approved ALP is reviewed for consistency with recommended approach capabilities, consistent with FAR Part 77, which is also described later in the chapter.

The updated inventory of existing facilities presented in Chapter Two, is used to evaluate conformance with FAA standards. **Figures 5-1** and **5-2** depict the location of the non-conforming items for the airport design standards described in this chapter. Detailed definitions of the standards and their application at the airport are provided later in the chapter. The reader is encouraged to consult the Glossary of Aviation Terms provided to clarify technical information.

Several airfield-built items, including wind cones and the electronic transmitters for the instrument landing system (ILS) are located within the runway safety area (RSA) and/or object free area (OFA) for Runway 7/25. These items were installed by, or at the direction of FAA in past years with locations determined to be "fixed-by-function." However, a review of current FAA airport design standards (AC 150/5300-13A, Para. 605, NAVAIDs as obstacles, Table 6-1) indicates that wind cones, glide slopes, and localizers do not meet the fixed-by function criteria for installation in either the RSA or OFA.

AC 150/5300-13A provides addition guidance (Note 3 in Table 6-1) on glideslope installations: "*Allowing a GS within ROFA due to a physical constraint should be evaluated on a case-by-case basis.*" It is unknown whether the FAA siting of the Runway 25 glideslope was determined through physical site constraints. However, it is noted that the installation of the Runway 25 glide slope transmitter (located approximately 350 feet north of runway centerline) reflects standard historical practice, if not the actual or modified FAA standards currently in place. A review five ILS runways in the region with similar characteristics to Runway 7/25, finds that all of the glideslope transmitters are located within the runway OFA (units installed 350 to 390 feet from runway centerline). It appears that the current FAA design standards and past FAA design/installation practices differ, which may prompt relocation of the Runway 25 glideslope outside of runway OFA, if deemed necessary by FAA through a case-by-case basis review.

Within the landside areas of the airfield, the most common non-conforming item identified is the object free area (OFA) dimension or aircraft wingtip clearances (measured from taxilane centerline to an adjacent hangar or fence) for several hangar taxilanes. The hangar taxilanes are designed to accommodate small aircraft (ADG I), which has a standard OFA width of 79 feet and a centerline to fixed/moveable object clearance of 39.5 feet (1/2 the OFA width). Although the clearances vary, most aircraft movements occur without incident. However, as facilities are updated or replaced (aircraft parking or hangars), new facilities should be designed to conform to appropriate design standards.

Figure 5-1: Conformance Items

Figure 5-2: Conformance Items

2002 Airport Master Plan Overview

The 2002 Eastern Oregon Regional Airport Master Plan[3] provided recommendations for airport facility improvements for a planning period that extended to 2020. As noted in the Inventory Chapter, several improvement projects have been conducted since the last master plan was completed in 2002, consistent with the planning guidance depicted on the 2002 Airport Layout Plan. The projects included in the 2002-2020 capital improvement program (CIP) for the master plan are summarized in **Table 5-1.** Projects that have been completed are noted in the table. The previously recommended improvements that have not been implemented, will be reevaluated, modified, or eliminated based on the updated assessment of facility needs, current FAA guidelines, and the elements of the Airport Master Plan preferred development alternative.

3 Eastern Oregon Regional Airport Master Plan Update (October 2002). David Evans and Associates

TABLE 5-1: SUMMARY OF 2002 MASTER PLAN RECOMMENDED PROJECTS AND CURRENT STATUS

COMPLETED (YES/NO)	PROJECTS
	Short-Term (2002-2005)
Yes	Rehab Taxiway A/D
No	Rehab Air Carrier Apron
Yes*	Runway 16/34 Rehab – South of Runway 7/25 at 60-foot width, repaint markings *(*runway converted to taxiway in 2014)*
No*	Runway 16/34 Rehab – North of Runway 7/25 *(*runway converted to taxiway in 2014)*
No	T-Hangar Taxilane
Yes	Reconstruct Runway 7/25 including 20-foot paved shoulders
Yes	Pavement Rehabilitation: Misc. fog seal, localized preventative and stop gap pavement maintenance and repair (several rounds completed)
Yes	Runway 25 holding bay, 2-inch overlay
Yes	Runway 7/25 high intensity runway lighting (HIRL) replacement
No	Agricultural spraying operations pads (2 pads)
No	Environmental Assessment - Runway 11/29 Shift
Yes	Taxiway B, 3-inch overlay (south of Runway 7/25 and north of Nation Guard)
	Intermediate-Term (2006-2010)
No	Secondary access road
No	Runway 11/29 shift 2,000 feet NW construction
Yes	Passenger terminal building improvements
No	Phase I GA development (including drainage and utilities for entire area)
No	Phase I GA development (two 10-unit T-hangars, two conventional hangars)
No	Phase I air cargo improvements
No	Airport traffic control tower improvements
No	Master plan update
No	Fuel farm
No	Improvements for deicing
No	New FBO in GA development area
	Long-Term (2011-2015)
No	Phase II GA development (one 10-unit T-hangar, 2 conventional hangars)
No	Agricultural spraying operations pads (3 pads)
Yes	ARFF/SRE expansion
No	Phase II air cargo improvements

Several additional projects have been completed that were not anticipated in the last master plan update including the closure of Runway 16/34 and conversion to Taxiway G, and the construction of pads for unmanned aircraft systems (UAS) east of Taxiway G and south of Taxiway F.

Design Aircraft

The 2002 Airport Layout Plan (ALP) lists a Boeing 737 (Airport Reference Code (ARC) C-III) as the "existing" and "ultimate" critical (design) aircraft for Runway 07/25. However, it is noted that the airport master plan's aviation activity forecasts did not identify any B737 operations, instead presenting a "CRJ" (Bombardier/Canadair Regional Jet) as the design aircraft through the 20-year planning period. During this period, Horizon Air served Pendleton with de Havilland/Bombardier Dash 8-300 turboprop aircraft (ARC A-III) and was in the process of adding CRJs to their fleet. The forecast rationale was based on the anticipated fleet for Horizon Air and "other airlines that could start serving the Pendleton market." The CRJ models in service in 2002 included the CRJ 100, 200, and 700 models, all of which are ARC C-II aircraft. The composite of the CRJ's "Category C" approach speed and the Dash 8's "Airplane Design Group III" wingspan resulted in an ARC C-III designation for Runway 7/25.

For Runway 11/29, the 2002 ALP lists a Beechcraft King Air (ARC B-II) as the "existing" critical aircraft and a Bombardier Dash 8 Q400 (ARC C-III) as the "ultimate" critical aircraft.

Updated Assessment

The commercial air service assumptions in the 2002 airport master plan used to define critical/design aircraft are no longer valid. Based on FAA-defined activity-driven criteria, the "existing" design aircraft for both runways is a single-engine turboprop, operated by commercial passenger and cargo express carriers, included in Aircraft Approach Category A and Airplane Design Group II (ARC A-II). The "future" design aircraft is a multi-engine turboprop, such as a 34-seat Saab 340, which is consistent with the preferred commercial passenger forecast. This aircraft is included in Aircraft Approach Category B and Airplane Design Group II (ARC B-II).

However, as noted earlier, it is recommended that the "existing" design standards for Runway 7/25 and 11/29 depicted on the 2002 ALP be maintained for the current twenty-year planning period:

- Runway 7/25: ARC C-III
- Runway 11/29: ARC B-II

This recommendation reflects the current facility configurations in place, preserves current operational capabilities, and accommodates the wide range of aircraft types expected to operate at Eastern Oregon Regional Airport over the next twenty years and beyond.

The aviation activity forecast for 2035 includes nearly 260 ADG IV operations, in addition to a variety of ADG II and III business jet operations. The combined total of ADG IV operations and all other Approach Category C & D operations is projected to increase from 218 to 446 by the end of the twenty-year planning period. Although the projected activity remains below the FAA's "substantial use" standard of 500 annual itinerant operations, the anticipated growth reflects a trend toward increased large and high-performance aircraft activity. Preserving the existing physical characteristics of key airfield components will allow the airport to continue accommodate this unique mix of air traffic.

It is noted that Runway 7/25 was rehabilitated in 2005 with a 3-inch overlay based on ARC C-III design standards. This project is expected to provide a service life that extends well into the current twenty-year planning period. Several sections of major taxiways (50 feet wide) have also been rehabilitated or reconstructed since the last master plan was completed. The FAA recently informed airport management about a project to relocate the instrument landing system (ILS) localizer transmitter/antenna for Runway 7/25 outside of the ARC C-III runway safety area and object free area. The FAA's decision to relocate the ground based navigational aid is consistent with preserving current runway capabilities and design standards.

<u>Airport Planning & Design Standards Note:</u>

The following FAA standards are recommended for use in evaluating the runway-taxiway system at Eastern Oregon Regional Airport:

Maintain "Existing" Design Standards (as depicted on 2002 FAA-Approved ALP) for current and future use.

Runway 07/25 (Existing/Future) – *Airport Reference Code (ARC) C-III. Runway design standards for aircraft approach category C & D runways with* ***lower than 3/4-statute mile*** *approach visibility minimums.*

- *Existing and Future Runway Protection Zone (RPZ) for Runway 25 based on l**ower than 3/4-mile approach visibility minimums**. Existing RPZ for Runway 07 based on **not lower than 1-mile approach visibility**.*
- *Future RPZ for Runway 07 based on approach visibility standard **not lower than 3/4-mile**.*
- *FAR Part 77 airspace planning criteria based on "other than utility runways" with precision instrument approach (Rwy 25) and non-precision instrument approach (Rwy 07) with visibility minimums as low as 3/4-statute mile.*

Runway 11/29 (Existing/Future) – *Airport Reference Code (ARC) B-II. Runway design standards for aircraft approach category A & B runways with* ***not lower than 1-statute mile*** *approach visibility minimums.*

- *Existing and Future Runway Protection Zone (RPZ) for both runway ends based on **not lower than 1-mile approach visibility**.*
- *FAR Part 77 airspace planning criteria based on "other than utility runways" with non-precision instrument approaches, with visibility minimums greater than 3/4-statute mile.*

All references to the "standards" are based on these assumptions, unless otherwise noted (Per FAA Advisory Circular 150/5300-13A and FAR Part 77.25)

FAR Part 77 Surfaces

Airspace planning for U.S. airports is defined by Federal Aviation Regulations (FAR) Part 77.25 – Objects Affecting Navigable Airspace. FAR Part 77 defines airport imaginary surfaces, which are established to protect the airspace immediately surrounding a runway. The airspace and ground areas surrounding a runway should be free of obstructions (i.e., structures, parked aircraft, trees, etc.) to the greatest extent possible to provide a safe operating environment for aircraft. FAA Order 8260.3B - United States Standard for Terminal Instrument Procedures (TERPS) defines protected airspace surfaces associated with instrument approaches and departures.

The physical characteristics of the imaginary surfaces are determined by runway category and the approach capabilities of each runway end. Consistent with FAA planning standards, the FAR Part 77 Airspace Plan shall depict the "ultimate" airspace for the recommended runway configuration depicted on the accompanying Airport Layout Plan (ALP). **Figures 5-3 and 5-4** on the following pages illustrate plan and isometric views of generic Part 77 surfaces.

Figure 5-3: FAR Part 77

Figure 5-4: FAR Part 77

The 2002 Airspace Plan depicts airspace surfaces based on an "other than utility" runway designations, consistent with use by aircraft weighing more than 12,500 pounds. **Table 5-2** summarizes the airspace surface dimensions for Eastern Oregon Regional Airport depicted on the 2002 plan. Based on the updated inventory conducted for the airport master plan, two notable changes to the airport's protected airspace have occurred that are not reflected on the 2002 Airspace Plan:

- **Runway 16/34 is depicted as an active runway.** The runway was closed in 2014 and converted to Taxiway G.
- **The Runway 11 approach is depicted as visual with a 5,000-foot 20:1 approach surface.** Runway 11 currently supports a straight-in non-precision instrument (NPI) approach. Runway 11/29 has NPI markings at both runway ends, consistent with current approach capabilities. The current approach surface designation for Runway 11 is non-precision instrument, which corresponds to a 10,000-foot length and a 34:1 approach slope.

These items are noted in **Table 5-2**, and will be incorporated into the update airspace plan.

No obstructions are noted on the 2002 Airspace Plan for any defined FAR Part 77 airspace surfaces at Eastern Oregon Regional Airport. As noted in the conformance review, obstructions were identified in the Part 77 Surfaces. An AGIS survey is being conducted as part of the master plan update. Survey data, including runway elevations, and locations and elevations for terrain, trees, and built items, will be added to the updated airspace plan and discussed in Chapter 8, Airport Layout Plan.

It is also noted that Runway 7/25 and 11/29 are depicted with future extensions, consistent with the 2002 ALP drawing. The recommendations for future runway configurations are re-examined later in the facility requirements chapter and will be reflected in the evaluation of airport development alternatives.

TABLE 5-2: FAR PART 77 AIRSPACE SURFACES

	DEPICTED IN 2002 AIRSPACE PLAN	CURRENT RECOMMENDATIONS
RUNWAY 07/25 | Other than Utility | Precision		
Width of Primary Surface	1,000 feet	No Change
Approach Surface Length	Runway 07: 10,000 feet Runway 25: 50,000 feet	No Change
Approach Surface Slope	Runway 07: 34:1 Runway 25: 50:1 - Inner 10,000 feet Runway 25: 40:1- Outer 40,000 feet	No Change
Approach Surface Width at End	Runway 07: 3,500 feet Runway 25: 16,000 feet	No Change
RUNWAY 11/29 | Other than Utility | Non-Precision		
Width of Primary Surface	500 feet	No Change
Approach Surface Length	Runway 11: 5,000 feet Runway 29: 10,000 feet	**Runway 11: 10,000 feet** Runway 29: No Change
Approach Surface Slope	Runway 11: 20:1 Runway 29: 34:1	**Runway 11: 34:1** Runway 29: No Change
RUNWAY 16/34 | Utility | Visual		
Width of Primary Surface	500 feet	**Runway Closed**
Approach Surface Length	Runway 16: 5,000 feet Runway 34: 5,000 feet	**Runway Closed**
Approach Surface Slope	Runway 16: 20:1 Runway 34: 20:1	**Runway Closed**
AIRPORT (APPLICABLE TO ALL RUNWAYS)		
Transitional Surface	7:1 Slope to 150 feet above runway	
Horizontal Surface Elevation/Radius	150 feet above airport elevation/10,000 feet	
Conical Surface	20:1 for 4,000 feet	

Approach Surfaces

Runway approach surfaces extend outward and upward from each end of the primary surface, along the extended runway centerline. As noted earlier, the dimensions and slope of the approach surfaces are determined by the type of aircraft intended to use the runway and the most demanding approach planned for the runway.

Runway 11/29 has a 456-foot displaced threshold on Runway 29. This configuration does not alter the FAR Part 77 approach surface for Runway 29, which begins at the end of the primary surface, 200 feet beyond the end of useable runway. The 2002 Approach Plan & Profile drawing (sheet 7 of 13) depicts a 20:1 obstacle clearance approach (OCA) for Runway 29 that is located 200 feet from the displaced threshold. The standards for the Runway 29 OCA are evaluated later in the chapter.

Primary Surface

The primary surface is a rectangular plane that centered on the runway (at centerline elevation) and extends 200 feet beyond each runway end. The width of the primary surface depends on runway category, approach capability, and approach visibility minimums. The primary surface should be free of any penetrations, except items with locations fixed by function (i.e., PAPI, runway or taxiway edge lights, etc.). The primary surface end connects to the inner portion of the runway approach surface.

As noted in the preceding table, Runway 7/25 has a 1,000-foot wide primary surface that is consistent with the instrument landing system (ILS) precision instrument approach on Runway 25. A review of existing conditions identifies a portion of the UAS launch pads located south of Taxiway F located within the primary surface (less than 500 feet south of runway centerline). Aircraft and support equipment located on or adjacent to the pads create a penetration to the primary surface. Relocating (or modifying) the built items and operating areas outside the primary surface is recommended. Marking (high visibility markings) or lighting (red obstruction lights) the areas when occupied is recommended as an interim measure.

The primary surface for Runway 11/29 is 500 feet wide and extends 200 feet beyond each runway end (5, 981 feet overall). A review of existing conditions identifies a section of security fence near the east end of the terminal building located within the primary surface for Runway 11/29 (less than 250 feet from runway centerline). Adding obstruction lights or relocating the fence outside the primary surface recommended. The 2002 Airport Layout Plan recommended shifting Runway 11/29 several hundred feet northward. If this recommendation is maintained, the primary surface would also be shifted northward, which may eliminate the fence obstruction. An updated evaluation of runway configuration will be conducted in the alternative analysis.

Transitional Surface

The transitional surface is located along both sides of the primary surface and inner approach surface, represented by planes of airspace that rise perpendicular to the runway centerline at a slope of 7 to 1, until reaching an elevation 150 feet above the runway elevation, where it connects to the runway horizontal surface. The transitional surface should be free of obstructions (i.e., parked aircraft, structures, trees, etc.).

The UAS launch pads located in the Runway 7/25 primary surface and the fence located in the Runway 11/29 primary surface also penetrate the adjacent transitional surfaces. Relocating (or modifying) the built items and operating areas to avoid penetrating the 7:1 transitional surface is recommended. Marking (high visibility markings) or lighting (red obstruction lights) the items is recommended as an interim measure.

Horizontal Surface

The horizontal surface is a flat plane of airspace located 150 feet above runway elevation with its boundaries defined by the radii (10,000 feet for other than utility instrument runways) that extend from each runway end. The outer points of the radii for each runway are connected to form an oval, which is defined as the horizontal surface. The 2002 Airspace Plan depicts the horizontal surface elevation at 1,643 feet above mean sea level (MSL). No areas of terrain penetrations are identified on the 2002 airspace plan.

Conical Surface

The conical surface is an outer band of airspace, which surrounds and ties into the horizontal surface. The conical surface begins at the elevation of the horizontal surface and extends outward 4,000 feet at a slope of 20:1. The 2002 Airspace Plan depicts the top elevation of the conical surface as 1,843 feet MSL, 200 feet above the horizontal surface and 350 feet above the airport elevation. No areas of terrain penetrations are identified on the 2002 airspace plan.

Airport Design Standards

Federal Aviation Administration (FAA) Advisory Circular (AC) 150/5300-13A, Airport Design, serves as the primary reference in planning airfield facilities. A comparison of existing and future design standards for each runway are summarized in **Table 5-3** and **Table 5-4**. The design standards for airplane design group (ADG) IV are also presented for comparison in **Table 5-3,** since the majority of military fixed aircraft operating at the airport are included in this category. A summary of Eastern Oregon Regional Airport current conformance with these standards is presented in **Table 5-5**.

As noted earlier, it is recommended that the "existing" ARC C-III is maintained for Runway 7/25 and ARC B-II is maintained for Runway 11/29 in the current twenty-year planning period. Detailed narrative descriptions of design standards are presented in the following sections of the chapter.

TABLE 5-3: RUNWAY 07/25 AIRPORT DESIGN STANDARDS SUMMARY (DIMENSIONS IN FEET)

FAA STANDARD	RUNWAY 07/25 EXISTING CONDITIONS[1]	ADG C-III 2 LOWER THAN ¾ MILE STANDARDS	ADG B-IV & C-IV 2 LOWER THAN ¾ MILE STANDARDS
Runway Length	6,301	5,540[5]	5,540[5]
Runway Width	150	150	Same as C-III
Runway Shoulder Width	25	25	Same as C-III
Runway Safety Area • Width • Beyond RWY End • Prior to Landing Threshold	500 1000 600	500 1000 600	Same as C-III
Runway Obstacle Free Zone • Width • Beyond RWY End • Prior to Landing Threshold	400 200 200	400 200 200	Same as C-III
Precision Obstacle Free Zone • Width • Beyond RWY End • Prior to Landing Threshold	800 200 200	800 200 200	Same as C-III
Object Free Area • Width • Beyond RWY End • Prior to Landing Threshold	800 1000 600	800 1000 600	Same as C-III
Runway Protection Zone Length	Runway 07: 1,000 [9] Runway 25: 2,500 [8]	Runway 07: 1,000 [9] Runway 25: 2,500 [8]	Same as C-III
Runway Protection Zone Inner Width	Runway 07: 500 [9] Runway 25: 1,000 [8]	Runway 07: 500 [9] Runway 25: 1,000 [8]	Same as C-III
Runway Protection Zone Outer Width	Runway 07: 700 [9] Runway 25: 1,700 [8]	Runway 07: 700 [9] Runway 25: 1,700 [8]	Same as C-III
Runway Centerline to: Parallel Taxiway/Taxilane CL Aircraft Parking Line (APL) Building Restriction Line (BRL)	400 Not Depicted[3] 750[4]	400 570[6] 745[7]	Same as C-III
Taxiway Width	50	50 (TDG 3&4)	75
Taxiway Shoulder Width	20	20 (TDG 3&4)	25
Taxiway Safety Area Width	118	118	171
Taxiway Object Free Area Width	186	186	259
Taxiway CL to Fixed/Movable Object	93	93	129.5
Taxilane OFA Width	162	162	225
Taxilane CL to Fixed/Movable Object	81	81	112.5

Notes:

1. Airfield dimensions as depicted on 2002 Airport Layout Plan (ALP).
2. Based on Precision Instrument Runway standards for Runway 07/25 (Per FAR Part 77). Runway Protection Zone dimensions based on approach visibility minimums less than ¾ mile (RWY 25) and 1-mile (Rwy 7), Per AC 150/5300-13A and as depicted on 2002 ALP.
3. 2002 ALP does not depict an Aircraft Parking Line; the closest aircraft parking area (UAS launch pads) is located approximately 500 feet from runway centerline.
4. The 2002 ALP depicts a 750-foot BRL for Runway 7/25, which is the setback required to accommodate a 35.7-foot structure (building roof elevation above runway elevation) without penetrating the 7:1 Transitional Surface. Setbacks for larger structures and structures constructed in areas with terrain elevated above runway elevation would depend on roof elevation and actual clearance of Transitional Surface slope.
5. Runway length required for large aircraft weighing more than 60,000 pounds, per FAA runway length software.
6. Distance required to accommodate a 10-foot aircraft tail height without penetrating the 7:1 Transitional Surface. This distance also clears the existing parallel taxiway OFA and the runway OFA. Setbacks for larger aircraft types (i.e., large business jets, etc.) would be based on tail height clearance of Transitional Surface slope.
7. Distance required to accommodate 35-foot structure without penetrating the 7:1 Transitional Surface and clearing parallel taxiway OFA.
8. RPZ dimensions for Runway 25, based on approach visibilities of less than ¾ -mile.
9. RPZ dimensions for Runway 07, based on approach visibilities of less than 1-mile.

TABLE 5-4: RUNWAY 11/29 AIRPORT DESIGN STANDARDS SUMMARY (DIMENSIONS IN FEET)

FAA STANDARD	RUNWAY 11/29 EXISTING CONDITIONS[1]	ADG B-II[2] NOT LOWER THAN 1-MILE EXISTING AND FUTURE STANDARDS
Runway Length	5,581	5,280[6]
Runway Width	100	75
Runway Shoulder Width	25	10
Runway Safety Area • Width • Beyond RWY End • Prior to Landing Threshold	 150 300 300	 150 300 300
Runway Obstacle Free Zone • Width • Beyond RWY End • Prior to Landing Threshold	 400 200 200	 400 200 200
Object Free Area • Width • Beyond RWY End • Prior to Landing Threshold	 500 300 300	 500 300 300
Runway Protection Zone Length	1,000	1,000
Runway Protection Zone Inner Width	500	500
Runway Protection Zone Outer Width	700	700
Runway Centerline to: Parallel Taxiway/Taxilane Centerline Aircraft Parking Line (APL) Building Restriction Line (BRL)	 400 Not Depicted[3] 350	 300 320/465.5[4] 355/465.5[5]
Taxiway Width	50	35
Taxiway Shoulder Width	10	10
Taxiway Safety Area Width	79	79
Taxiway Object Free Area Width	131	131
Taxiway CL to Fixed/Movable Object	65.5	65.5
Taxilane OFA Width	115	115
Taxilane CL to Fixed/Movable Object	57.5	57.5

Notes:

1. Airfield dimensions as depicted on 2002 Airport Layout Plan (ALP).
2. Based on Non-Precision Instrument Runway for Runway 11/29 (Per FAR Part 77). Runway Protection Zone dimensions based on approach visibility minimums not lower than 1-mile (Per AC 150/5300-13A) based on 2002 ALP.2002
3. ALP does not depict an Aircraft Parking Line; the closest aircraft parking area (UAS launch pads) is located approximately 500 feet from runway centerline.
4. Distance required to accommodate a 10-foot aircraft tail height without penetrating the 7:1 Transitional Surface/distance required to clear 400-foot parallel taxiway OFA. Setbacks for larger aircraft types (i.e., large business jets, etc.) would be based on tail height clearance of Transitional Surface slope.
5. Distance required to accommodate 15-foot structure (typical T-Hangar and small conventional hangar roof heights) without penetrating the 7:1 Transitional Surface/distance required to clear 400-foot parallel taxiway OFA.
6. Runway length required for future design aircraft (Saab 340 ME Turboprop), ISA +20 degrees C; MGTW, optimal flaps.

TABLE 5-5: EASTERN OREGON REGIONAL AIRPORT CURRENT CONFORMANCE WITH FAA DESIGN STANDARDS

ITEM	RUNWAY 07/25 AIRPLANE DESIGN GROUP III APPROACH VISIBILITY LOWER THAN ¾ MILE	RUNWAY 11/29 AIRPLANE DESIGN GROUP II APPROACH VISIBILITY NOT LOWER THAN 1-MILE
Runway Safety Area	No[1]	No[3]
Runway Object Free Area	No[2]	No[4]
Runway Obstacle Free Zone	Yes	Yes
Taxiway Safety Area	Yes	Yes
Taxiway Object Free Area	Yes	Yes
Taxilane Object Free Area	Yes	Yes
Building Restriction Lines	Yes	Yes
Aircraft Parking Lines	Yes	Yes
Runway Protection Zones	No[6]	No[5]
Runway - Parallel Taxiway Separation	Yes	Yes (*)
Runway Width	Yes	Yes (*)
Runway Length	Yes	Yes(*)
Taxiway Width	Yes	Yes(*)

Notes:

(*) Indicates facility dimension currently exceeds standard

1. AC 150/5300-13, Table 6-1 includes the permitted items with a "fixed-by-function designation" within the RSA. Runway 7/25 has one non-permitted item (Runway 25 localizer) within the RSA.
2. AC 150/5300-13, Table 6-1 includes the permitted items with a "fixed-by-function designation" within the OFA. Runway 7/25 has four non-permitted items (glide slope, localizer, and two windsocks) within the OFA.
3. Runway 11/29 does not meet RSA standards for grade, slope, and permitted items (road beyond Runway 29 end). Displaced threshold and declared distances are used to mitigate non-standard RSA at Runway 11 end.
4. A road and section of fence is located within the OFA for Runway 11/29.
5. A road is located within the departure RPZ for Runway 29.
6. A portion of the Runway 25 RPZ is not controlled by airport.

Runway Safety Area (RSA)

The FAA defines the runway safety area (RSA) as a prepared surface centered on, and surrounding a runway. "*The RSA enhances the safety of aircraft which undershoot, overrun, or veer off the runway, and it provides greater accessibility for fire-fighting and rescue equipment during such incidents.*" The FAA notes that the RSA is intended to enhance the margin of safety for landing and departing aircraft and that RSA standards cannot be modified.

The FAA states that *"The RSA must be:*

(1) cleared and graded and have no potentially hazardous ruts, humps, depressions, or other surface variations;
(2) drained by grading or storm sewers to prevent water accumulation;
(3) capable, under dry conditions, of supporting snow removal equipment, Aircraft Rescue and Fire Fighting (ARFF) equipment, and the occasional passage of aircraft without causing structural damage to the aircraft; and
(4) free of objects, except for objects that need to be located in the RSA because of their function. Objects higher than 3 inches above grade must be constructed, to the extent practical, on frangibly mounted structures of the lowest practical height with the frangible point no higher than 3 inches above grade. Other objects, such as manholes, should be constructed at grade and capable of supporting the loads noted above. In no case should their height exceed 3 inches above grade."

The recommended transverse grade for the RSA located along the sides of a runway ranges between 1½ to 5 percent from runway shoulder edges. The recommended longitudinal grade for the first 200 feet of RSA beyond the runway end is 0 to 3 percent. The remainder of the RSA must remain below the runway approach surface slope. The maximum negative grade is 5 percent. Limits on longitudinal grade changes are plus or minus 2 percent per 100 feet within the RSA.

A review of current FAA airport design standards (AC 150/5300-13A, Para. 605, NAVAIDs as obstacles, Table 6-1) indicates that the localizer transmitter/antenna array located in the RSA (west end) for Runway 7/25 does not meet the FAA's current fixed-by-function criteria for installation. This item is owned by FAA and was installed by FAA. FAA has notified airport management of plans to relocate the units outside the RSA.

The south end of Runway 11/29 is built on an embankment that drops significantly beyond the runway end. The south end of the RSA is limited by both the grade change (≈-41 feet) and a built item (gate-controlled access road) located approximately 250 feet beyond the end of the runway on its extended centerline. An "as-built" update of the 2002 ALP drawing identifies the elevation of the access road as 1,460 feet MSL, approximately 31 feet lower than the listed runway end elevation (1,491.4 feet). The Runway 29 threshold is displaced 456 feet and declared distances are published for Runway 11 and 29 operations, which effectively mitigates the non-standard RSA. The 2002 ALP drawing depicts a recommended relocation of the Runway 29 end, approximately 2,000 feet north of its current south end, in conjunction with a 2,000-foot extension at the north end. The change in runway configuration will be reexamined and evaluated in the alternative's analysis.

A summary of the RSA requirements and noted non-conforming items for Runway 07/25 and 11/29 are presented below:

Runway Safety Area (RSA) Existing & Future Standards	
Runway 07/25 ARC C-III Lower than 3/4-mile	**Runway 11/29 ARC B-II Not Lower than 1-mile**
500 feet wide and extends 1,000 feet beyond each departure end of runway, and 600 feet prior to landing.	150 feet wide and extends 300 feet prior and beyond each runway end Runway 29 threshold is displaced by 456 feet and published declared distances are used for both runway ends to mitigate a non-standard RSA at south end of runway, and built items located within the RSA footprint
Non-Conforming Items	
• Localizer antenna is located in the RSA (west end, approximately 975 feet beyond Runway 7 threshold)	• RSA at Runway 29 end does not meet dimensional, gradient, slope, and compaction standards (mitigated, as described above) • A road is located in the RSA beyond the south end of Runway 11/29 (mitigated, as described above)

Runway Object Free Area (ROFA)

Runway object free areas (ROFA) are two-dimensional surfaces "*centered about the runway centerline*" intended to be clear of ground objects that protrude above the runway safety area edge elevation. Obstructions within the ROFA may interfere with aircraft flight in the immediate vicinity of the runway. The FAA clearing standard is:

"The ROFA clearing standard requires clearing the ROFA of above-ground objects protruding above the nearest point of the RSA...Except where precluded by other clearing standards, it is acceptable for objects that need to be located in the ROFA for air navigation or aircraft ground maneuvering purposes to protrude above the nearest point of the RSA, and to taxi and hold aircraft in the ROFA. To the extent practicable, objects in the ROFA should meet the same frangibility requirements as the RSA. Objects non-essential for air navigation or aircraft ground maneuvering purposes must not be placed in the ROFA. This includes parked airplanes and agricultural operations."

A review of current FAA airport design standards (AC 150/5300-13A, Para. 605, NAVAIDs as obstacles, Table 6-1) indicates that several airfield-built items, including two wind cones and the electronic localizer and glide slope transmitters/antenna for the instrument landing system (ILS) located within the ROFA for Runway 7/25, and do not meet the FAA's current fixed-by function criteria for installation. The FAA-owned localizer is planned for relocation (outside the ROFA). The wind cones were installed at the direction of FAA in past years with locations determined to be "fixed-by-function." It appears that the wind cones do not meet current FAA standards and may need to be relocated, if FAA is unable to waive the standard. As noted earlier, the FAA provides addition flexibility on glideslope installations within runway ROFAs, which may be permitted on a case-by-case basis. It appears that the current FAA design standards and past FAA design/installation practices differ, which may prompt relocation of the Runway 25 glideslope outside of the ROFA, if deemed necessary by FAA through its review.

The ROFA for Runway 11/29 has similar limitations to the RSA described earlier, in terms of the footprint defined by the ADG II dimensional standards. However, since the ROFA represents an unobstructed plane that "*requires clearing…of above-ground objects protruding above the nearest point of the RSA*", vehicles traveling on the road (31 feet below runway end elevation) within the ROFA, do not protrude above the elevation defined by RSA. The Runway 29 displaced threshold and the use of declared distances on Runway 11/29 effectively mitigate the items located in the ROFA footprint. Gradient standards are limited to positive transverse grade changes. In contrast to the RSA, there are no standards for negative grade changes and there is no surface compaction standard for the ROFA.

A summary of the ROFA dimensional standards and noted non-conforming items for Runway 07/25 and 11/29 are presented below:

Runway Object Free Area (ROFA) Existing & Future Standards	
Runway 07/25 ARC C-III Lower than 3/4-mile	**Runway 11/29 ARC B-II Not Lower than 1-mile**
800 feet wide and extends 1,000 feet beyond each departure end of runway and 600 feet prior to landing	500 feet wide and extends 300 feet prior and beyond each runway end Runway 29 threshold is displaced by 456 feet and published declared distances are used for both runway ends to mitigate a non-standard ROFA at south end of runway, and built items located within the OFA footprint
Non-Conforming Items	
• Runway 25 glideslope • Runway 25 localizer • Two lighted windsocks	• A section of security fence (between the terminal building and the approach end Runway 29) is located in the ROFA • Access road (beyond Runway 29 end) is located in the ROFA footprint, but is below grade (public access is controlled by gate)

Obstacle Free Zone (OFZ)

Obstacle free zones (OFZ) are planes of airspace extending upward above the runway elevation. The OFZs are intended to mitigate close-in obstructions that may create hazards for aircraft. The FAA defines the following clearing standard for the OFZ:

"The OFZ clearing standard precludes aircraft and other object penetrations, except for frangible NAVAIDs [navigational aids] *that need to be located in the OFZ because of their function."*

The FAA defines four types of OFZs for runways, depending on their type and configuration:

RUNWAY OBSTACLE FREE ZONE (ROFZ)

"The ROFZ is a defined volume of airspace centered above the runway centerline, above a surface whose elevation at any point is the same as the elevation of the nearest point on the runway centerline. The ROFZ extends 200 feet beyond each end of the runway."

The ROFZ width dimension for runways accommodating large aircraft is 400 feet, which applies to Runway 7/25 and 11/29.

Three additional OFZs are defined for Runway 25, based on its current precision instrument approach capabilities:

INNER-TRANSITIONAL OFZ

"The inner-transitional OFZ is a defined volume of airspace along the sides of the ROFZ and inner-approach OFZ. It applies only to runways with lower than ¾-statute mile approach visibility minimums. Runway to taxiway separation may need to be increased, but may not be decreased, based on this requirement.

(1) Small runway standards - omitted (this item does not apply to either runway at Eastern Oregon Regional Airport)

(2) For operations on runways by large aircraft, separate inner-transitional OFZ criteria apply for Category (CAT) I and CAT-II/III runways.[4]

(a) For CAT-I runways, the inner transitional OFZ begins at the edges of the ROFZ and inner-approach OFZ, then rises vertically for a height "H", and then slopes 6 (horizontal) to 1 (vertical) out to a height of 150 feet above the established airport elevation."[5]

[4] Runway Categories (I, II, III) refer the level of precision available, with Category I being the most typical for general aviation and smaller commercial runways; Categories II and III are more sophisticated and require special aircraft equipment and/or crew training.

[5] (1) In U.S. customary units, $H_{feet} = 61 - 0.094\ (S_{feet}) - 0.003\ (E_{feet})$. S is equal to the most demanding wingspan of the airplanes using the runway and E is equal to the runway threshold elevation above sea level.

INNER-APPROACH OFZ

"The inner-approach OFZ is a defined volume of airspace centered on the approach area. It applies only to runways with an ALS [approach lighting system]. *The inner-approach OFZ begins 200 feet from the runway threshold at the same elevation as the runway threshold and extends 200 feet beyond the last light unit in the ALS. Its width is the same as the ROFZ and rises at a slope of 50 (horizontal) to 1 (vertical) from its beginning."*

PRECISION OBSTACLE FREE ZONE (POFZ)

"The POFZ is defined as a volume of airspace above an area beginning at the threshold at the threshold elevation, and centered on the extended runway centerline (200 feet long by 800 feet wide)."

"(1) The surface is in effect only when all of the following operational conditions are met:

- *(a) The approach includes vertical guidance.*
- *(b) The reported ceiling is below 250 feet or visibility is less than 3/4 statute mile (or Runway Visual Range [RVR] is below 4,000 feet)* [6]
- *(c) An aircraft on final approach is within two (2) miles of the runway threshold.*

(2) When the POFZ is in effect, a wing of an aircraft holding on a taxiway waiting for runway clearance may penetrate the POFZ; however, neither the fuselage nor the tail may penetrate the POFZ. Vehicles up to 10 feet in height necessary for maintenance are also permitted in the POFZ."

(3) The POFZ is applicable to all runway thresholds, including displaced thresholds."

A summary of the OFZ dimensional standards for current/future approach capabilities and noted non-conforming items for Runway 07/25 and 11/29 are presented below:

[6] RVR: Runway Visual Range. A measurement (in feet) of visibility along the runway with transmissometer installed on the side of a runway.

Obstacle Free Zone (OFZ) Existing & Future Standards	
Runway 07/25 ARC C-III Lower than 3/4-mile	**Runway 11/29 ARC B-II Not Lower than 1-mile**
<u>ROFZ</u> – 400 feet wide and 200 feet beyond runway ends. **Runway 25** <u>Inner Approach OFZ:</u> 400 feet wide, extending 200 feet beyond last approach light fixture at a slope of 50:1 <u>Inner Transitional OFZ</u>: Extends outward from edges of ROFZ at a slope of 6 to 1 to an elevation 150 feet above airport elevation <u>Precision OFZ</u>: 800 feet wide and 200 feet long, beginning at runway threshold	<u>ROFZ</u> – 400 feet wide and 200 feet beyond runway ends.

<u>Runway Protection Zone (RPZ)</u>

The FAA defines runway protection zone as follows:

"The RPZ is trapezoidal in shape and centered about the extended runway centerline. The central portion and controlled activity area are the two components of the RPZ. The central portion of the RPZ extends from the beginning to the end of the RPZ, centered on the runway centerline. Its width is equal to the width of the runway OFA."

"The RPZ may begin at a location other than 200 feet beyond the end of the runway. When an RPZ begins at a location other than 200 feet beyond the end of the runway, two RPZs are required, i.e., a departure RPZ and an approach RPZ. The two RPZs normally overlap."

The FAA notes that when approach RPZs are required, they begin 200 feet beyond the (displaced) threshold.

"The RPZ's function is to enhance the protection of people and property on the ground. This is best achieved through airport owner control over RPZs. Control is preferably exercised through the acquisition of sufficient property interest in the RPZ and includes clearing RPZ areas (and maintaining them clear) of incompatible objects and activities."

RPZs with buildings, roadways, or other items do not fully comply with FAA standards. It is recognized that realigning major surface roads located within the RPZs may not always be feasible. As noted earlier, the FAA recommends that airport sponsors control the RPZs through ownership whenever possible, although avigation easements[7] are commonly used when outright purchase is not feasible.

NOTE: FAA GUIDANCE OF RPZS AND ROADS (FALL 2012)

In October 2012, the FAA released interim guidance regarding RPZs and incompatible land uses, with a particular focus on roads. The policy directs airport sponsors to evaluate any planned changes to existing RPZs that introduce or increase the presence of roads in RPZs. Existing roads within RPZs are also to be evaluated during master planning to determine if feasible alternatives exist for realignment of roads outside RPZs or for changes to the RPZs themselves. The FAA Seattle Airports District Office has subsequently indicated that their primary focus related to this policy is related to proposed changes to RPZs—as the result of a change to a runway end/RPZ location, approach visibility minimums, or the built items located in an RPZ. FAA funding for the removal of roads located in RPZs is currently limited based on the large number of cases involved, although changes in FAA funding priorities themselves, are subject to change. Any proposed changes in the length or configuration of either runway that changes the location of existing RPZs evaluated in this study are subject to review by FAA headquarters in Washington D.C.

A summary of the RPZs is presented below:

Runway Protection Zone (RPZ) Existing & Future Standards	
Runway 07/25 ARC C-III	**Runway 11/29 ARC B-II**
Runway 07 (Visibility ≥ 1–mile) 500' x 1700 ' x 1000' Runway 25 (Visibility < 3/4 –mile) 1000' x 2500' x 1700'	Runway 11/29 (Visibility ≥ 1–mile) 500' x 1000' x 700'
Non-conforming Items	
• A portion of the Runway 25 RPZ is located off-airport property (verify avigation easement)	• A road is located in the RPZ for Runway 29.

Runway Visibility Zone (RVZ)

A runway visibility zone (RVZ) is required with intersecting runways, so that aircraft operating on each runway are visible to other pilots during critical runway operations. The FAA determines the boundaries of an RVZ by establishing imaginary lines that connect the two runways' line of sight points. The location of the line of site points are based on the overall length of each runway and the distance between the

[7] An avigation easement (*avigation = aviation + navigation*) involves the purchase of airspace rights over a particular defined ground area. The easement normally limits the maximum height of any natural or built items (to coincide with the runway approach surface slope) and may include provisions restricting the type of activities permitted. Compensation is negotiated between the airport owner and property owner.

intersection and each runway end. The line of sight standards for intersecting runways requires that "*any point 5 feet above runway centerline and in the runway visibility zone must be mutually visible with any other point 5 feet above the centerline of the crossing and inside the runway visibility zone.*"

The 2002 Airport Layout Plan depicted an RVZ based on three runways. Since the last master plan update, Runway 16/34 was closed and converted to a taxiway. This runway closure has changed the existing RVZ, which will be depicted on the updated airport layout plan. Any recommended changes to the existing runway configuration would affect the future RVZ.

Threshold Siting Surface (TSS)/Obstacle Clearance Surface (OCS)

The 2002 Runway 11-29 Approach Plan and Profile sheet of the ALP drawing set depicts an obstacle clearance surface (OCS), also known as a threshold siting surface (TSS), on Runway 29 associated with the 456-foot displaced threshold. As noted earlier, the displaced threshold addresses non-standard runway safety area beyond the end of Runway 29 and is not driven by obstruction clearance requirements for the approach. No obstructions to either the Runway 29 FAR Part 77 approach surface or the Runway 29 OCS are identified.

The design characteristics for the Runway 29 surface are defined by runway type and use, consistent with AC 150/5300-13A (Table 3-2. Approach/departure standards table), as noted below. A primary consideration in the evaluation is the RNAV GPS instrument approach to Runway 29, which is authorized for approach category A through D aircraft.

Approach Surfaces (OCS/TSS) Per AC 150/5300-13A (Table 3-2) Existing & Future Standards
Runway 29 (Displaced Threshold)
Dimensions: Length 10,000 feet Inner Width 800 feet Outer Width 3,800 feet Surface Begins 200 feet from displaced threshold Slope 20:1 Runway Type Approach end of runways expected to support instrument night operations serving greater than approach Category B aircraft.

Taxiway Safety Area (TSA)

Taxiway safety areas (TSA) serve a similar function as runway safety areas and use the same design criteria for surface conditions, with varying dimensions based on airplane design group.

As with runway safety areas, the ground surface located immediately adjacent to the taxiways periodically requires maintenance or improvement to adequately support the weight of an aircraft or an airport vehicle. Grading and/or soil compaction within taxiway safety areas should be completed as needed, and grass, brush or other debris should be regularly cleared to maintain FAA standards. Taxiway pavement edges should be periodically inspected to ensure that grass, dirt, or gravel build-ups do not exceed 3 inches. Items within the safety area that have locations fixed by function (taxiway reflectors, edge lights, signs, etc.) must be mounted on frangible (break away) mounts.

It is noted that safety area standards do not apply to *taxilanes* typically located within hangar developments or aircraft parking aprons. Taxilanes provide aircraft access within a parking or hangar area; taxiways provide aircraft access between points on the airfield and serve runways (e.g. parallel taxiways and exit taxiways).

There are no known non-standard TSA conditions on the airport. The major taxiways on the airfield are used by all aircraft types and should use the same design parameters as the main runway. Taxiway D extends east-west, north of the main apron, and is used to provide access to the apron and adjacent landside facilities by general aviation aircraft. A summary of the safety area standards for existing taxiways is presented below:

Taxiway Safety Area Existing & Future Standards	
Taxiway A, B, F, G, and D (East of TWY A) ADG III	**Taxiway D (West of TWY A) ADG II**
118 feet wide (59 feet each side of taxiway centerline)	79 feet wide (39.5 feet each side of taxiway centerline)

Taxiway/Taxilane Object Free Area (TOFA)

Taxiway and taxilane object free areas (TOFA) are intended to provide unobstructed taxi routes (adequate wingtip clearance) for aircraft. The outer edge of the TOFA defines the recommended standard distance from taxiway or taxilane centerline to a fixed or moveable object. The FAA clearing standard prohibits service vehicle roads, parked aircraft, and above ground objects (hangars, other built items, etc.), except for objects with locations fixed by function (navigational aids, airfield signs, etc.). The applicable design standard (ADG I, II, or III), is determined by the largest aircraft that may be accommodated in aircraft parking areas or hangars served by that taxiway/taxilane. The taxiway/taxilane OFA standards are not affected by potential changes in approach visibility minimums. As with the taxiway safety area, any items within the taxiway OFA that have locations fixed by function, must be frangible (breakaway) to meet FAA standards.

There are no known non-standard Taxiway OFA conditions on the airport. The design assumptions (aircraft use) previously described for taxiway safety area also apply to taxiway OFA. A summary of the object free area standards for existing taxiways is presented below:

Taxiway OFA Existing & Future Standards	
Taxiway A, B, F, G, and D (East of TWY A) ADG III	**Taxiway D (West of TWY A) ADG II**
186 feet (93 feet each side of centerline)	131 feet (65.5 feet each side of centerline)

TAXILANES

Eastern Oregon Regional Airport has taxilanes that are used by both small and large aircraft (ADG I and II). The taxilanes are located within the main apron area and in the aircraft hangar area at the west end of the main apron.

Hangar taxilane clearances are measured by the distance from the taxilane centerline to an adjacent fixed or moveable object (building, fence, tree, parked aircraft, etc.), on both sides of centerline. For T-hangars, hangar rows, and tiedown rows designed to accommodate small aircraft, the ADG I taxilane OFA standard is 79 feet. The existing OFA clearances for ADG I taxilanes on the airport vary from approximately 63 to 79 feet.

Since the type of aircraft located within a particular hangar can change over time, the appropriate method for determining taxilane clearance standards is based on the largest aircraft that can be physically accommodated within the hangar. ADG II standards are applied to taxilanes serving larger hangars (door openings 50 feet and larger) and ADG I standards are applied to taxilanes serving small individual hangars or T-hangars. While relocation of existing hangars is not considered highly feasible, any planned new hangars (and associated taxilanes) should meet the applicable ADG I or II taxilane object free area clearance standard. A modification to FAA standards should be requested for the existing hangars, with the recommended disposition (reconfiguration) to be addressed when the hangars reach the end of their useful lives.

Taxilanes on the main apron provide access to aircraft parking, circulation within the apron and access to hangars, fueling, the terminal building, and fixed base operators. The primary access taxilane extends along the north edge of the main apron, with connections to the west hangar area, the main apron, terminal area, and adjacent taxiways. The west end of the main apron has five north-south taxilanes that serve small airplane tiedowns. These taxilanes are designed to meet the ADG I taxilane OFA standard, which includes clearance between the parked aircraft (rather than measuring from tiedown anchors) to the adjacent taxilanes.

Figure 5-2 presented earlier in the chapter illustrates the existing and standard taxilane OFA clearances on the airport. A summary of the object free area standards for existing taxilanes is presented below:

Taxilane OFA Existing & Future Standards	
Large Airplane Tiedown and Large Hangar Taxilanes ADG II	**T-Hangars and Small Airplane Tiedown Taxilanes ADG I**
115 feet (57.5 feet each side of centerline)	79 feet (39.5 feet each side of centerline)

Building Restriction Line (BRL)

A building restriction line (BRL) identifies the minimum setback required to accommodate a typical building height, such as hangar. The location of the BRL is based on the ability to remain clear of all runway and taxiway clearances on the ground and the protected airspace surrounding a runway. Taller buildings are located progressively farther from a runway in order to remain beneath the 7:1 transitional surface slope that extend laterally from both sides of a runway.

The 2002 Airport Layout Plan depicts a 750-foot BRL for Runway 7/25 and a 500-foot BRL or Runway 11/29 for areas that directly parallel the runways. Additional BRLs are defined based on the location the runway visibility zone (RVZ) and setbacks along the south side of the main apron. The existing BRLs are effective in avoiding building conflicts on the airfield for the existing and future design standards. A summary of the BRL requirements is presented below:

Building Restriction Lines (BRL) Existing & Future Standards	
Runway 07/25 ARC C-III Lower than 3/4-mile Visibility	**Runway 11/29 ARC B-II Not Lower than 1-mile Visibility**
750-foot BRL (distance from runway centerline)	500-foot BRL (distance from runway centerline)
Accommodates structures up to 35.7 feet above runway elevation based on 1,000-foot wide runway primary surface	Accommodates structures up to 35.7 feet above runway elevation based on 500-foot wide runway primary surface

All new construction on or in the immediate vicinity of the airport should involve FAA review for airspace compatibility. FAA Form 7460-1, Notice of Proposed Construction or Alternation, should be prepared and submitted to FAA at least 60 to 90 days prior to planned construction. The 7460 form should be submitted by the city for any projects located on the airport and submitted by the applicant for any projects located off airport property (coordinated with City of Pendleton and Umatilla County, if outside Pendleton city limits). The FAA will review all proposed development to determine if the proposed action would create any obstructions to FAR Part 77 airspace surfaces. In general, the FAA will object to proposals that result in a penetration to any FAR Part 77 airspace surfaces on the basis of safety.

Aircraft Parking Line

The aircraft parking line (APL) represents the minimum setback required for locating aircraft parking in order to clear the adjacent runway-taxiway system. The location of the APL is generally determined by the more demanding of runway airspace clearance and taxiway obstruction clearance. The 2002 Airport Layout Plan does not depict APLs.

All general aviation parking is located on the main apron or adjacent to Taxiway G (aerial applicator loading pads). These parking areas are located clear of adjacent taxiway OFA setbacks and the protected airspace surfaces for both runways.

Five UAS launch pads are located parallel to Runway 7/25 and Taxiway F, approximately 493 feet south of the runway centerline. This location protects the (C-III) taxiway OFA (93 feet from taxiway centerline), but does not avoid penetrations to the FAR Part 77 airspace defined for Runway 7/25. A review of the UAS pad location identifies a penetration to the primary surface and adjacent transitional surface when the pads are occupied with aircraft or support equipment.

With the exception of the UAS pads noted above, all other aircraft parking areas on the airfield are adequately sited to avoid airspace and design standards conflicts. Recommended APL locations will be reflected on the updated ALP. Minimum APL dimensions, based on a typical small aircraft with a 10-foot tail height are presented below:

Aircraft Parking Line (APL) Existing & Future Standards	
Runway 07/25 ARC C-III Lower than 3/4-mile	**Runway 11/29 ARC B-II Not Lower than 1-mile**
570-foot APL (distance from runway centerline) Distance to clear 10-foot aircraft tail height Based on 1,000-foot wide primary surface	320-foot APL (distance from runway centerline) Distance to clear 10-foot aircraft tail height Based on 500-foot wide primary surface
Other APL Setbacks Aircraft parking adjacent to ADG II Taxilane (north end of main apron - 65.5 feet from taxilane centerline)	

Runway - Parallel Taxiway Separation

Both runways have sections of parallel taxiways with a 400-foot runway-taxiway separation, which meets or exceeds the applicable design standards (Runway 7/25: ARC C-III 400 feet; Runway 11/29: ARC B-II 240 feet). The 2002 Airport Layout Plan depicts several recommended taxiway improvements, including construction of a parallel taxiway section to the Runway 11 end. The taxiway improvement recommendations will be reviewed in the updated alternatives analysis.

Airside Requirements

Airside facilities are those directly related to the arrival, departure, and movement of aircraft:

- Runways
- Taxiways
- Airfield Instrumentation and Lighting

Runways

The adequacy of the existing runway system at Eastern Oregon Regional Airport was analyzed from a number of perspectives including runway orientation, airfield capacity, runway length, and pavement strength.

Runway Orientation & Wind Coverage

The orientation of runways for takeoff and landing operations are primarily a function of wind velocity and direction, combined with the ability of aircraft to operate under adverse wind conditions. A runway's wind coverage is determined by an aircraft's ability to operate with a "direct" crosswind, which is defined as 90 degrees to the direction of travel. For planning purposes FAA has defined the maximum direct crosswind for small aircraft as 12 miles per hour (10.5 knots); for larger general aviation aircraft, a 15-mile per hour (13 knot) direct crosswind is used. Aircraft are able to operate safely in progressively higher wind speeds as the crosswind angle decreases and the wind direction aligns more closely to the direction of flight. In addition, some aircraft are designed to safely operate with higher crosswind components. Ideally, an aircraft will take off and land directly into the wind or with a light crosswind. The FAA recommends that primary runways accommodate at least 95 percent of local wind conditions; when this level of coverage is not provided, the FAA recommends development of a secondary (crosswind) runway.

The wind rose depicted on the 2002 Airport Layout Plan (data summary sheet), indicates that Runway 07/25 accommodates approximately 95.9 percent of local wind conditions for small aircraft and 98.0 percent of local wind conditions for larger aircraft. Runway 11/29 accommodates approximately 87.8 percent of local wind conditions for small aircraft and 93.1 percent of local wind conditions for larger aircraft. The wind data consists of 14,608 observations, although no reference to the observation period is cited.

Runway Length

CONCLUSION

Based on the composition of existing and forecast activity, the current lengths of Runways 7/25 and 11/29 are considered adequate.

OVERVIEW AND ANALYSIS

Runway length requirements are based primarily on airport elevation, mean maximum daily temperature of the hottest month, runway gradient, and the critical aircraft type expected to use the runway. For Eastern Oregon Regional Airport, the future design aircraft identified in the updated aviation activity forecasts is a multi-engine turboprop aircraft (above 12,500 pounds), such as a Saab 340. The airport also accommodates a wide range of business class turboprop and jet aircraft, and transport category military aircraft that are capable of operating on the existing runways in most conditions. Both runways are capable of accommodating the current and forecast mix of aircraft.

The large military fixed-wing operations are generated by C-130 and C-17 aircraft included in ARC B-IV and C-IV. It is noted that these aircraft are designed to operate on relatively short runways, and they do not typically operate at or near maximum gross weights at Eastern Oregon Regional Airport. Despite their physical size and weight, the runway length requirements for these aircraft are not disproportionately greater than most high-performance business aircraft or multi-engine aircraft used in regional commercial airline service.

For general aviation airports that accommodate regular business jet activity, the FAA recommends using a "family of design aircraft" approach to defining runway length requirements. FAA Advisory Circular (AC) 150/5325-4B, Runway Length Requirements for Airport Design identifies a group of "airplanes that make up 75 percent of the fleet," which represents the majority of business jets operating at Eastern Oregon

Regional Airport. Based on local site conditions, this segment of activity requires runway lengths ranging from 4,900 feet to 6,650 feet, with 60 and 90 percent useful loads, which is comparable to existing runway lengths available.

The runway length required to accommodate the representative multi-engine turboprop (Saab 340) reflected in the updated commercial passenger forecasts is estimated at approximately 5,130 feet (1,493 feet MSL, ISA +15 degrees C, MGTW 29,000 pounds, optimal flaps).

For reference, a summary of FAA-recommended runway lengths for planning based on the requirements of small and large general aviation aircraft in a variety of load configurations is presented in **Table 5-6**. The runway length requirements for a variety of business aircraft are summarized in **Table 5-7**.

TABLE 5-6: FAA RECOMMENDED RUNWAY LENGTHS FOR PLANNING

Runway Length Parameters for Eastern Oregon Regional Airport[1]

- Airport Elevation: 1,493 feet MSL
- Mean Max Temperature in Hottest Month: 88.0 F
- Maximum Difference in Runway Centerline Elevation: 9 Feet
- Dry Runway
- Existing Runway Lengths: Runway 07/25: 6,300 feet; Runway 11/29: 5,581 feet

Small Airplanes with less than 10 seats	
75 percent of these airplanes	2,990
95 percent of these airplanes	3,560
100 percent of these airplanes	4,190
Small airplanes with 10 or more seats	4,520
Large Airplanes of 60,000 pounds or less	
75 percent of these airplanes at 60 percent useful load	5,000
75 percent of these airplanes at 90 percent useful load	6,790
100 percent of these airplanes at 60 percent useful load	5,900
100 percent of these airplanes at 90 percent useful load	8,800
Airplanes of more than 60,000 pounds	5,540

1. Runway length parameters taken from 2002 ALP Data Table
2. Runway lengths determined by FAA Airport Design Software and tables in FAA AC

TABLE 5-7: TYPICAL BUSINESS AIRCRAFT RUNWAY REQUIREMENTS

AIRCRAFT	PASSENGERS (TYPICAL CONFIGURATION)	MAXIMUM TAKEOFF WEIGHT	RUNWAY LENGTH REQUIRED FOR TAKEOFF[1]	RUNWAY LENGTH REQUIRED FOR LANDING[2]
Cessna Citation Mustang	4-5	8,645	4,360	2,820
Cessna Citation CJ1+	5-6	10,700	4,860	2,900
Cessna Citation CJ2+	6-7	12,500	4,360	3,270
Cessna Citation CJ3	6-7	13,870	3,970	3,060
Cessna Citation CJ4	6-7	16,950	5,210	2,955
Cessna Citation Bravo	6-9	14,800	4,770	3,720
Cessna Citation Encore+	8-11	16,830	4,750	3,090
Cessna Citation XLS+	9-12	20,200	4,580	3,490
Cessna Citation VII	7-8	22,450	5,910	3,240
Citation Sovereign	9-12	30,300	4,250	2,890
Cessna Citation X	8-12	36,100	6,500	3,880
Learjet 45	7-9	20,500	5,660(a)	3,060(a)
Challenger 300	8-15	37,500	6,440(a)	2,990(a)
Gulfstream 100 (Astra)	6-8	24,650	7,010(a)	3,360(a)
Gulfstream 200 (G-II)	8-10	35,450	7,900(a)	3,770(a)
Gulfstream 300 (G-III)	11-14	72,000	6,630(a)	3,670(a)

1. FAR Part 25 or 23 Balanced Field Length (Distance to 35 Feet Above the Runway); 2,000 feet MSL, 86 degrees F; Zero Wind, Dry Level Runway, 15 degrees flaps, except as otherwise noted.
2. Distance from 50 Feet above the runway; Flaps Land, Zero Wind.

(a) For general comparison only. Manufacturer runway length data based on sea level and standard day temperature (59 degrees F) at maximum takeoff/landing weight;

Source: Aircraft manufacturers operating data, flight planning guides.

Based on local conditions and the methodology outlined in **AC 150/5325-4B**, Runway 07/25 (6,300 feet) can accommodate 100 percent of large airplanes (60,000 pounds or less maximum gross takeoff weight) at 60 percent useful load under typical operating conditions.[8] Runway 11/29 can also accommodate the majority of these aircraft. Some aircraft may experience operational limits (payload or fuel) on warmer days during the summer months or during the winter months if the runway has an accumulation of snow or ice.

As noted earlier, the FAA establishes a "substantial use threshold" of 500 annual itinerant operations (takeoffs and landings) for the design aircraft or family of design aircraft. To pursue a runway extension based on the higher demand profile, the City of Pendleton would need to document sufficient activity (either

[8] Useful load is generally defined as passengers, cargo, and usable fuel.

aircraft currently using the airport that are regularly constrained by current runway length or new aircraft unable to operate at the airport due to runway length) to meet the FAA substantial use threshold.

The 2002 Airport Layout Plan (ALP) depicts a 2,000-foot extension for Runway 07/25, increasing its ultimate length to 8,300 feet. The ALP notes that implementation is "to be determined" and the master plan narrative indicates that the recommended extension is intended to "accommodate the ultimate aircraft demand." Based on the updated forecast activity, no extension of Runway 7/25 is anticipated at this time. However, to preserve long-term options, the City may wish to consider retaining the extension on the updated ALP as a long-term development reserve.

The ALP also depicts a 2,000-foot north extension on Runway 11/29 that would coincide with a 2,000-foot relocation (shift) of the south end of the runway. No increase in runway length was recommended. A review of the proposed reconfiguration of the runway will be included in the alternative's analysis.

Runway Width

Runway 7/25

Runway 07/25 is 150 feet wide, which meets the 150-foot dimensional standard ARC C-III with current approach capabilities and approach visibility minimums.

As noted earlier, Runway 07/25 is capable of accommodating large military or commercial transport aircraft in a variety of missions critical to both national security and regional emergency response. This capability was preserved in the 2006 FAA-funded runway rehabilitation project and it is recommended that the existing runway dimensions be maintained during the current planning period.

Runway 11/29

Runway 11/29 is 100 feet wide, which exceeds the 75-foot dimensional standard for ARC B-II with current and future approach capabilities and approach visibility minimums.

As the airport's secondary runway, narrowing the runway to 75 feet may be considered at the time of the next major rehabilitation or reconstruction to meet the ADG II width standard. The cost of narrowing, including replacement/relocation of edge lighting and signage, changes in stormwater drainage systems, and pavement removal will be evaluated during design for comparison to maintaining the existing 100-foot width and determining FAA funding levels.

Airfield Pavement

An updated airfield pavement maintenance and management study for Eastern Oregon Regional Airport was completed by ODA in 2014, as noted in the Inventory Chapter. The updated pavement plan, along with other engineering analyses will be the primary decision making tools for the ongoing maintenance and replacement of airfield pavements.

The 2014 Pavement Condition Index (PCI) report identifies several rehabilitation, reconstruction, or maintenance projects for the 2015-2019 time period (recommended year based on rated condition, not available funding):

- Runway 7/25: Overlay (2015)
- Runway 11/29: Slurry Seal (2015)
- Taxiway G (north section): Reconstruct (2015)
- Taxiway G (south section): Overlay (2015)
- Taxiway A: Slurry Seal (2015)
- Taxiway B: Overlay; Reconstruct at intersection with Taxiway A (2015)
- Taxiway D: Overlay and Slurry Seal (2015)
- Taxiway E: Overlay (2015)
- Taxiway F: Slurry Seal (2019)
- Main Apron (west section): Slurry Seal (2018)
- Main Apron (east section): Slurry Seal (2015)
- West Hangar Taxilanes: Reconstruct (2015)

City engineering staff and their airport engineering consultant evaluate the PCI report recommendations as part of the ongoing capital improvement program for the airport. Specific recommendations on the timing and effort required for each project will be determined during design.

For planning purposes, rehabilitation of asphalt pavements is typically assumed on a 15- to 25-year cycle, depending on use and pavement design. Crack filling and fog/slurry seals should be performed on a regular basis for all asphalt sections to maximize the useful life of the pavement. A prioritized list of pavement rehabilitation or reconstruction projects will be provided in the updated capital improvement program.

Pavement Strength

Ideally, airfield pavements designed to accommodate all aircraft operating at an airport should have the same weight bearing capacity as the primary runway. Pavements accommodating small aircraft (tiedown apron, hangar taxilanes, etc.) are normally designed based on 12,500-pound aircraft weight. The 2002 Airport Layout Plan lists the pavement strength for Runway 07/25 as 210,000-pound dual tandem wheel and Runway 11/29 as 122,000-pound dual tandem wheel.

The runways, major taxiways and the main apron have historically accommodated a full range of general aviation, commercial and military aircraft and appear to meet future requirements.

Taxiways

Taxiways are constructed primarily to facilitate aircraft movements to and from the runway system. Some taxiways are necessary simply to provide access between aprons and runways, while other taxiways become necessary as activity increases and safer and more efficient circulation to and from the airfield is needed. The existing taxiway system at Eastern Oregon Regional Airport provides aircraft access to the runways and all landside facilities. The major taxiways on the airfield are 50 feet wide, consistent with the ADG III width standard.

No major capacity related improvements are anticipated during the current twenty-year planning period, although the addition of taxiway access to the Runway 11 threshold is identified as a safety-related improvement. Aircraft are currently required to back-taxi on the runway to reach the north end of the runway and turnaround for a full-length Runway 11 takeoff.

A future high-speed exit taxiway for Runway 25 (south side) and a connecting access taxiway to the terminal area is also depicted on the 2002 ALP. These taxiway improvements will be reviewed in the alternative's analysis.

Taxilanes

The development of new hangars or aircraft parking areas may require taxilane extensions or new taxilanes. New access taxiways and taxilanes serving small hangar development should be 25 feet wide for ADG I aircraft and 35 feet wide for ADG II aircraft. As noted earlier in this chapter, several existing hangar taxilanes do not meet FAA taxilane object free area clearing standards. While it may not be feasible to relocate existing hangars, new hangars should be configured to meet FAA standards.

Any new taxilanes added within the main aircraft apron should be configured to provide the standard object free area clearances for the specific aircraft types. Light airplane tiedown rows and adjacent taxilanes are typically designed to accommodate ADG I aircraft; parking positions for larger, business class aircraft should be designed based on ADG II taxilane clearing standards. The taxilane centerline to the nearest fixed or moveable object (parked aircraft) of 39.5 and 57.5 feet, correspond to the object free area dimensions for ADG I and II.

Hot Spots

Recent FAA guidance on runway-taxiway connections suggests that direct, unbroken taxiway routes extending from aircraft parking aprons directly to a runway have the potential of creating hot spots for runway safety/incursion.

The FAA Runway Safety Action Team identifies known hot spots at airports, which are defined as:

> "*A location on an airport movement area with a history of potential risk of collision or runway incursion, and where heightened attention by pilots and drivers is necessary.*"

Eastern Oregon Regional Airport has one hot spot documented by FAA:

> "*The hold line for Rwy 29 extends across a portion of the ramp and is approximately 360' long. The signs are difficult to see from some spots on the ramp.*"

The airport development alternatives portion of the master plan will consider options for mitigating this hot spot. The alternatives evaluation will also review the existing airfield layout, including the configuration of Taxiway B, which provides a direct path between Oregon National Guard apron and the intersection of Runways 7/25 and 11/29, which may be inconsistent with current FAA design guidance, as contained in FAA Engineering Brief No. 75.[9]

Airfield Instrumentation, Lighting, and Marking

Navigational Aids

Runway 7/25 is equipped with a Category I instrument landing system that includes a glide slope located near the Runway 25 end and a localizer located beyond the end of Runway 07. Both navigational aids have FAA-defined critical areas designed to protect the integrity of the electronic transmission signals. It is noted that with the exception of Taxiway G, all existing exit taxiways for Runway 07/25 are located on the south side of the runway. Future expansion of landside facilities on the north side of the airport are likely to utilize Taxiway G. Any new north side taxiways, particularly taxiways that may be located near the east end of the runway, will need to meet all FAA location and "ILS hold" requirements to protect the glide slope, which is located approximately 1,000 feet west of the Runway 25 end.

The FAA's long-range plan for maintaining conventional ground-based navigation aids, particularly ILS equipment, remains unclear. However, it is possible that the next generation replacement for the ILS that provides comparable approach capabilities will be based entirely or largely on satellite navigation.

[9] FAA Engineering Brief No. 75: Incorporation of Runway Incursion Prevention into Taxiway and Apron Design (November 8, 2007)

However, until a clear replacement platform is identified by FAA, the airspace and protected ground areas associated with the ILS must continue to be protected.

Runways with Category I instrument landing systems (ILS) are often equipped with Runway Visual Range (RVR) instrumentation. Automated RVR systems provide pilots with distances (in feet) where runway markings are visible, compared to normal AWOS or ASOS visibility measurements in increments of a mile. The RVR sensors are installed adjacent to the runway at one or more points in order to provide accurate, unbroken line of sight measurements along the entire length of the runway. The addition of RVR on Runway 7/25 may be considered to improve the operational capabilities of the current instrument approaches and weather reporting.

When an existing navigational aid reaches the end of its useful life, it will be replaced with the most current navigational aids available. For example, when the visual approach slope indicator (VASI) for Runway 7 requires replacement, it would be replaced with a precision approach path indicator (PAPI), or the standard in effect at the time. For planning purposes, the useful life for visual navigational aids is 20 years and replacement projects for the systems will be included in the twenty-year capital improvement program.

FAA-owned navigational aids will be replaced or decommissioned by FAA at the end of their useful life. This includes the Pendleton VORTAC, located 4 miles west of the airport.

Runway & Taxiway Lighting

As noted in the Inventory Chapter, the lighting systems associated with Runway 07/25, Runway 11/29, major taxiways, and the airfield are all in good operating condition. Replacement of lighting systems is usually assumed at 20 years for airports in climatic areas similar to Pendleton, although some systems remain reliable, serviceable and fully function for a considerably longer period. For planning purposes, the useful life for airfield lighting systems is 20 years and replacement projects for the systems will be included in the twenty-year capital improvement program.

Runway & Taxiway Markings

Runway 07/25 has precision instrument markings on the Runway 25 end and non-precision markings on the Runway 07 end, consistent with existing instrument approach capabilities. The markings include side and edge stripes, threshold markings (12 vertical bars at each end), runway end numbers, and aiming point markings, and touchdown zone markings (Runway 25 end only). The runway has a yellow aircraft hold line located approximately 500 feet east of the intersection with Runway 11/29. The markings were applied during the runway sealcoat project in 2010 and are in good condition.

Runway 11/29 has non-precision instrument markings at both ends. The markings include side stripes, threshold markings (8 vertical bars at each end), runway designation numbers, centerline stripe, and aiming point markings. Runway 29 also has displaced threshold markings that include two arrows (centerline) leading to four arrows and the threshold bar. The runway has yellow aircraft hold lines located approximately 500 feet north and south of the intersection with Runway 7/25. The markings were applied during the runway sealcoat project in 2012 and are in good condition.

All runway exit taxiways have yellow aircraft hold line markings located outside the runway obstacle free zone (OFZ) and runway safety area (RSA) for Runways 07/25 and 11/29. Major taxiways have yellow edge stripes and centerline edge stripes, including enhanced (dashed) centerline stripes leading to each hold line. An aircraft hold line extends across the terminal apron and Taxiway D near the Runway 29 threshold.

All pavement markings will require periodic repainting as they wear or when sealcoats are applied.

Airfield Signage

The lighted airfield signage (location, mandatory, directional, destination, and distance remaining signs) are internally illuminated and are generally in good condition, with the exception of a few older signs that will need to be replaced as part of an airfield construction project.

Airfield Lighting

The airfield lighting systems (airport beacon, wind cones) are in good condition and reportedly function normally. It was recommended in the 2014 Airport Certification Inspection that the wind cones should not be tied into the runway's lighting circuit, since the wind cone lighting is not clearly visible when the runway lights are set on a lower intensity.

On Field Weather Data

The airport has an automated surface observing system (ASOS), which allows aircraft licensed under FAR Part 135 (air taxi/charter) and private aircraft operating under FAR Part 91 to operate in IFR conditions. The ASOS provides weather data to support airport operations in both visual and instrument conditions. Pendleton also has a hazardous inflight weather advisory service (HIWAS), which provides pilots with a continuous broadcast of hazardous weather information transmitted through the Pendleton VORTAC. The VORTAC consists of a co-located VHF omnidirectional range beacon (VOR) and a tactical air navigation system (TACAN). Both systems reportedly provide adequate weather data.

Landside Facilities

Landside facilities at Eastern Oregon Regional Airport include the terminal building, terminal apron, general aviation apron, agriculture apron, hangars, fixed base operator (FBO) facilities, and aircraft fueling facilities. The terminal apron provides adequate space for the current air service provider to load and unload passengers.

The FBO building and primary aircraft fueling area is located on the south edge of the main apron area, roughly mid-apron. This location provides direct access to the terminal apron, aircraft tiedowns, and hangars without having to enter the tower-controlled aircraft movement area. The 2002 Airport Master Plan recommended relocating the FBO building to the southwest corner of the main apron, which has not yet occurred. This recommendation will be reviewed in the alternative's analysis. Additional FBO facilities (hangars, fueling, etc.) are located near the west end of the main apron.

Terminal Building

The terminal building is located east of the main apron, near the approach end of Runway 29. The terminal building consists of airline ticketing counters, rental car counters, baggage claim area, passenger waiting area, airport administration offices, air traffic control tower, and airport restaurant. Expansion of the terminal building in its current location is limited to the east, due to the location of Runway 11/29. However, there is available space to the west of the terminal if needed as part of one of the development alternatives.

A Terminal Building Assessment was conducted as part of the master plan update and is included in **Appendix E**. The assessment provides detailed information of the buildings existing condition and facility needs based on the preferred forecast.

Aircraft Parking and Tiedown Apron

Aircraft aprons provide parking for locally based aircraft that are not stored in hangars, for transient aircraft visiting the airport, and for specialized ground operations such as aircraft fueling or air cargo operations. The main apron area at Eastern Oregon Regional Airport is approximately 126,690 square yards and provides (22) single-engine airplane tiedowns and (2) multi-engine airplane tiedowns in six north-south rows. The tiedown apron was reconstructed in 1999 and designed to provide adequate spacing between parked aircraft.

Conservative development reserves should be established to accommodate a combination of aircraft parking positions, roughly equal to 50 to 100 percent of the twenty-year forecast (net) demand. The location and configuration of the development reserves will be addressed in the alternative's analysis.

The projected aircraft parking requirements at Eastern Oregon Regional Airport are presented in **Table 5-8.**

SMALL GENERAL AVIATION PARKING DEMAND (LOCAL AND ITINERANT)

For planning purposes, it is assumed that 85 percent of forecast civilian based aircraft will be stored in hangars and 15 percent will use apron parking. Based on the projected increase over the twenty-year planning period, 11 small aircraft tiedowns will be required for locally based aircraft by 2035. These estimates may prove to be overly optimistic in gauging apron parking demand for based aircraft as additional hangar space is developed at the airport. However, this approach will ensure that adequate apron space is preserved for long-term use.

FAA Advisory Circular 150/5300-13 suggests a methodology by which itinerant parking requirements can be determined from knowledge of busy day operations. Future demand for itinerant parking spaces was estimated based on 40 percent of design day itinerant operations (40% of daily itinerant operations divided by two, to identify peak parking demand). The FAA planning criterion of 360 square yards per itinerant aircraft was applied to the number itinerant spaces to determine future itinerant ramp requirements. By 2035, itinerant aircraft parking requirements are estimated at eight aircraft positions including small airplane tiedowns, multi-engine and jet drive-through positions, and helicopter positions. It is anticipated that the parking requirements would include space for small airplanes, business aircraft, and helicopters.

LARGE AIRCRAFT PARKING

The airport accommodates regular itinerant business aircraft activity including turboprops and business jets, and large itinerant military aircraft in the apron area between the terminal and FBO. This section of pavement is not marked with specific aircraft parking positions, but it is assumed that multi-engine or business aircraft would need approximately 625 square yards for a parking position. The alternatives analysis will evaluate aircraft parking configuration options for this section of apron that meet FAA design standards for taxilane clearance and provide efficient movement of aircraft.

It is projected that the airport would need approximately two to three large aircraft parking positions (drive-through) for transient multi-engine and business aircraft through 2035.

AIR CARGO AIRCRAFT

The airport accommodates daily small package express flights with Cessna Caravan, single-engine turbine aircraft and the occasional Beechcraft 99, multi-engine turboprop. The airport does not currently have a dedicated air cargo apron for aircraft loading and unloading, although the area between the FBO and the City-owned T-hangar to the east is used for this purpose. It is projected that the airport will need to accommodate cargo ground operations and one or two parking positions for aircraft loading/unloading. The 2002 Airport Layout Plan depicts a future air cargo apron near the end of Runway 7, immediately west of the OANG facility. This recommendation will be reviewed in the alternative's analysis.

TERMINAL APRON

The terminal apron has adequate space available to accommodate forecast passenger aircraft demand and additional activity as required. The terminal apron has historically accommodated a variety of commercial aircraft ranging from regional turboprops to narrow body jets.

HELICOPTER PARKING

The airport accommodates locally based civilian and military helicopters and transient helicopters. OANG maintains an aircraft parking apron for their fleet of CH-47 Chinook helicopters. Transient civilian and military helicopters typically park on the main apron. Non-military locally-based helicopters are also parked on the apron when not stored in hangars or off-site. One to two parking positions for transient helicopters should be adequate to meet forecast demand through 2035.

The Life Flight helicopter based at the airport has also been parked on the main apron, adjacent to the City-owned T-hangar. Life Flight is currently constructing a hangar and small parking area near the northwest corner of the apron to accommodate their aircraft.

AGRICULTURAL OPERATIONS

The agricultural apron located east of Taxiway G has three loading pads with adjacent storage areas for equipment and supplies. The apron appears to be adequate for current and projected needs. An open collection basin, located adjacent to the intersection of Taxiway G and F, is hard piped from the apron. The status of the collection basin will be reviewed in the environmental review element of the master plan.

Aircraft Hangars

Eastern Oregon Regional Airport provides a variety of hangars including commercial hangars and hangars used primarily for aircraft storage. It is estimated that 85 percent of the airport's 61 civilian based aircraft are stored in hangars, with the remaining aircraft parked at tiedowns on the aircraft apron. For planning purposes, it is assumed that existing hangar space is committed and all additional (forecast) demand would need to be met through new construction.

As indicated in the aviation activity forecasts, the number of civilian based aircraft at Eastern Oregon Regional Airport is projected to increase by 13 aircraft during the twenty-year planning period. Based on a projected 85 percent hangar utilization level, additional long-term demand for new hangar space is estimated to be 11 spaces (approximately 16,500 square feet). A planning standard of 1,500 square feet per based aircraft stored in hangars is used to project gross space requirements. The projected hangar requirements for aircraft storage at Eastern Oregon Regional Airport are presented in **Table 5-8.**

In addition to aircraft storage, additional demand for business related and commercial hangar needs is anticipated. Specialized aviation service businesses such as engine & airframe repair, avionics, interior, paint shops, and UAS/UAV facilities generally prefer locations that provide convenient aircraft access. Highly successful aviation service businesses generally rely on both locally based aircraft and their ability to attract customers from outside the local area. While there is no specific formula to predict demand for general aviation service businesses at a particular airport, reserving space for additional commercial hangars is recommended.

Individual aircraft owner needs vary and demand can be influenced by a wide range of factors beyond the control of an airport. In addition, the moderate forecast growth in based aircraft may be exceeded if conditions are favorable. For this reason, it is recommended that hangar development reserves be identified to address the uncertainty of hangar market conditions and demand factors. Conservative development reserves should be established to accommodate a combination of conventional hangars and T-hangars, roughly equal to 50 to 100 percent of the twenty-year forecast (net) demand. The location and configuration of the development reserves will be addressed in the alternative's analysis.

TABLE 5-8: APRON AND HANGAR FACILITY REQUIREMENTS SUMMARY

ITEM	BASE YEAR (2014)	2020	2025	2030	2035
Based Aircraft Forecast (Civilian)	61	64	66	70	74
Based Aircraft Forecast (Military)	10	10	10	10	10
Aircraft Parking Apron (Note: capacities reflect current configuration of existing public use apron areas, actual capacity when reconfigured may be different.)					
Small Aircraft Tiedowns (SE/ME)	24				
Large Aircraft Parking Positions	0*				
Small Helicopter Parking Spaces	0*				
Air Cargo Aircraft Parking Spaces	0*				
Total Designated Parking Spaces Available	24*				
Main Apron Area (includes taxilanes, tiedown apron, terminal apron, and unusable space)	**126,690 sy (estimated)**				
Projected Needs (Gross Demand) [1]					
Locally Based Tiedowns (@ 300 SY each)		3 spaces / 900 sy	6 spaces / 1,800 sy	9 spaces / 2,700 sy	11 spaces / 3,300 sy
Small Airplane Itinerant Tiedowns (@ 360 SY each)		1 space / 360 sy	2 space / 720 sy	4 space / 1,440 sy	5 space / 1,800 sy
Business Aircraft Parking Positions (@ 625 SY each)		1 space / 625 sy	1 space / 625 sy	2 spaces / 1,250 sy	2 spaces / 1,250 sy
Small Helicopter Parking Positions (@ 380 SY each)		1 space / 380 sy	1 space / 380 sy	2 spaces / 760 sy	2 spaces / 760 sy
Air Cargo Parking Positions (@ 625 SY each)		1 space / 625 sy	1 space / 625 sy	2 spaces / 1,250 sy	2 spaces / 1,250 sy
Total Apron Needs		**7 Spaces / 2,890 sy**	**11 Spaces / 4,150 sy**	**19 Spaces / 7,400 sy**	**22 Spaces / 8,360 sy**
Aircraft Hangars (Existing Facilities)					
Existing Hangar Spaces[3]	45 spaces (estimated)				
Projected Needs (Net Increase in Demand) [2]					
(New) Hangar Space Demand (@ 1,500 SF per space) (Cumulative twenty-year projected demand: 11 spaces / 16,500 SF)		**+2 spaces / 3,000 sf**	**+3 spaces / 4,500 sf**	**+3 spaces / 4,500 sf**	**+3 spaces / 4,500 sf**

* These aircraft are accommodated on the main apron (open areas)

1. Aircraft parking demand levels identified for each forecast year represent forecast gross demand.
2. Hangar demand levels identified for each forecast year represent the net increase above current hangar capacity.
3. Hangar space estimated from conventional hangars and T-hangars

Aircraft Wash Down Facilities

Wash down facilities are recommended to accommodate general aviation aircraft with a catch basin and hard piping to divert wash residue into a sewer or stormwater treatment system. Wash facilities are typically sized to accommodate one aircraft on a pad approximately 50-foot-by-50-foot. The wash pad may be located adjacent to an existing parking apron or hangars; close access to utility systems is a key siting factor.

Surface Access

Surface access to Eastern Oregon Regional Airport is provided by Airport Road, which connects to Interstate 84 (I-84) at exit 207 and exit 202. Airport Road provides direct access to the airport terminal building, Pendleton Business and Industrial Park, and the south and west landside facilities. The UAS/UAV and agricultural operations area is connected to Airport Road by an on-airport service road that travels around the south end of Runway 11/29.

Continued development in the hangar area located at the west end of the main apron will require upgrades to existing access, fencing and controlled access gates.

Future development on the north side of the airport will require the construction of new access roads and airport service roads. Vehicle access roads can connect to NW Stage Gulch Road along the far west side of airport property, Daniel Road along the north side of airport property, or Pendleton Cold Springs Highway to the east. Airport service roads may also be required to accommodate aviation fuel trucks, airport personnel, tenants, and emergency vehicles transitioning from the south side of the airport to the north.

Vehicle Parking

The terminal vehicle parking lot has 176 paved and striped parking spaces. A rental car parking lot located adjacent to the terminal building parking lot has an additional parking 18 spaces. The airport maintenance building and fire station have 5 striped parking spaces. In addition, there are several large gravel and paved parking areas adjacent to the main apron area (outside the perimeter fence) and space adjacent to hangars (inside the perimeter fence).

Vehicle parking in the terminal parking lot may be reduced with the construction of a new hotel or expansion of the existing terminal building. If additional parking is needed, the airport has a large gravel area west of the terminal parking lot and Airport Road that could be converted into vehicle parking.

Agricultural Aircraft Facilities

As noted earlier, the airport has three loading pads and an associated apron located on the east side of the airfield adjacent to Taxiway G supporting agricultural aircraft operations. Additional tenant facilities are located at the west end of the main apron. The existing facilities appear to be adequate to meet current and future anticipated demand.

Air Traffic Control Tower (ATCT)

Eastern Oregon Regional Airport is served by an air traffic control tower (ATCT), located above the terminal building. Serco Inc., operates the airport traffic control tower under a contract with the FAA Contract Tower Program (FCT). The tower operates daily from 0600 to 2000 local time.

The ATCT operation is a key element in the emergence of unmanned aerial systems (UAS) activity at Eastern Oregon Regional Airport and the Pendleton UAS Range (PUR). Under current FAA rules, UAS and conventional aircraft operations are fully segregated. It is anticipated that changes in flight rules may occur in the current planning period, which makes continued ATCT operation a key safety need.

Unmanned Aerial Systems (UAS) Facilities

Eastern Oregon Regional Airport is a designated test site airport located in the Pendleton UAS Range (PUR). The Oregon Army National Guard (OANG) currently uses a 50-foot-by-50-foot compacted gravel pad located adjacent to the agriculture apron and Taxiway F for UAS recovery. The City is working with a developer to construct new hangars for UAS storage on the southwest corner of the airfield, near the T-hangars. Future launch site and development area is planned on the north side of Runway 7/25.

The ongoing growth of unmanned aerial systems (UAS) activity at Eastern Oregon Regional Airport is expected to generate specific facility requirements that are unique to the activity. As noted in the Forecast Chapter, growth in UAS activity has been recent and rapid, and this trend is expected to continue for the foreseeable future. UAS-related facility requirements include both airside and landside elements.

Airside

As noted in the updated aviation activity forecasts, UAS aircraft are expected to account for an increasing portion of overall airport activity during the current 20-year planning period. This activity currently consists of catapult launch devices (smaller UAS) and limited takeoffs and landings of larger UAS aircraft on closed taxiways (by NOTAM).

As UAS air traffic increases, the volume of full size UAS aircraft operations is expected to grow. These aircraft physically resemble conventional fixed wing aircraft and require normal takeoffs and landings. For long term planning purposes, physically separating conventional aircraft and UAS aircraft is recommended, whenever feasible. A future UAS runway is recommended to accommodate small fixed-wing UAS aircraft. It is anticipated that a runway length less than 3,000 feet would be adequate to accommodate the majority of this activity; larger UAS aircraft requiring longer runways would operate on Runway 7/25 or 11/29.

Landside

The development of UAS activity at Eastern Oregon Regional Airport generates a variety of landside facility needs associated with aircraft storage (apron, hangar, support equipment, etc.) and operations (flight test, research and development, remote in-flight monitoring, etc.). The updated aviation activity forecasts project 56 UAS aircraft will be based at the airport by 2035. It is assumed that the majority of these aircraft will require both hangar space for storage and apron space to support ground operations. Additional transient UAS activity is expected to require similar landside facilities. Due to rapidly changing conditions in this activity segment, it is recommended that large development reserves be identified on the airport to accommodate a wide range of demand scenarios. Specific facilities will be developed in response to market demand.

An Unmanned Aircraft Systems Evaluation was conducted as part of the master plan update and is included in Chapter 4.

Support Facilities

Fuel Facilities

Pendleton Aviation offers both 100-octane low lead (100LL) aviation gasoline (AVGAS) and Jet-A fuel. The FBO owns three underground storage tanks (10,000-gallon and 8,000-gallon Jet-A tanks and 10,000-gallons 100LL tank) located in the Pendleton Business and Industrial Park; one aboveground self-serve dispensing storage tank (1,000-gallon) located on-airport; four mobile dispensing trucks (3) Jet-A and (1) 100LL. In addition, several tenants own storage tanks, mobile dispensing trucks, and mobile dispensing trailers. Tenant individual fuel storage and dispensing tanks are for personal use only and are not used for fuel sales, unless authorized by the airport.

Based on current and forecast demand, the existing fuel storage tanks and dispensing facilities appear to be adequate. However, the City may wish to consider the development of a common fuel storage and dispensing location in terminal area that could accommodate multiple FBOs and eliminate underground fuel storage. It is also recommended that a secondary containment area for mobile fuel trucks and trailer parking be planned and constructed. Most mobile fuel trucks in use today have single wall tank construction and do not provide the secondary containment of double wall above-ground bulk storage tanks. It is anticipated that federal or state regulations will eventually require secondary containment for single wall tank mobile fuel trucks when unattended, such as for overnight parking when the trucks are not in service or otherwise monitored.

Utilities

The existing utilities on the airport appear to be adequate both in capacity and service, within the developed areas of the airport. However, if future development occurs on the north side of the airport, extensions of water, sanitary sewer, electric, gas, and telephone service will be required to support future expansion. Any proposed electric lines in the vicinity of the airfield should be buried.

Security

Eastern Oregon Regional Airport has a perimeter security fence and controlled access gates that meet both FAA and TSA standards for a Part 139 certificated airport. Airport fencing consists of a 7- and 8-foot chain link with three strands of barbed wire. There are floodlights around the terminal building, vehicle parking lot, and hangars. Any new development will be required to meet FAA and TSA security standards. Flood lighting should be provided in expanded aircraft parking and hangar areas and any other new development areas on the airport to maintain adequate security. The use of full or partial cutoff light fixtures is recommended for all exterior lighting on the airport to limit upward glare.

Aircraft Rescue and Firefighting (ARFF)

Eastern Oregon Regional Airport is governed by FAA Part 139 requirements, which require airports to provide aircraft rescue and firefighting (ARFF) services during operations conducted by air carriers certified under FAR Part 121. The current level of commercial passenger service operated under FAR Part 135, does not require an active ARFF response. The City constructed a 2-bay ARFF building in 2009 with direct access to the main apron, terminal and runway–taxiway system.

The current ARFF index (Index A) includes aircraft less than 90 feet in length. The equipment needed to meet Index A requirement includes; one vehicle that holds 100 gallons of water/AFFF and 500 pounds of sodium based dry chemical, or 450 pounds of potassium based dry chemical, or 460 pounds of halogenated agent. The airport's existing equipment and staffing meet Index A requirements and an upgrade to Index B is not projected in the twenty-year planning period.

Facility Requirements Summary

The projected twenty-year facility needs for Eastern Oregon Regional Airport are summarized in **Table 5-9**. As noted in the table, maintaining existing pavements represents a significant, ongoing facility need. The updated forecasts of aviation activity anticipate modest growth in activity that will result in similarly moderate airside and landside facility demands beyond existing capabilities. The existing airfield facilities have the ability to accommodate a significant increase in activity, with targeted facility improvements. For the most part, the need for new or expanded facilities, such as aircraft hangars, will be market driven. The non-conforming items noted at the beginning of this chapter are minor and can be addressed systematically during the current planning period to improve overall safety for all users.

TABLE 5-9: FACILITY REQUIREMENTS SUMMARY

ITEM	SHORT-TERM	LONG-TERM
Runway 07/25	Pavement Maintenance and Rehabilitation	Pavement Reconstruction/Rehabilitation Pavement Maintenance
Runway 11/29	Pavement Maintenance and Rehabilitation	Runway Width Reduction (75 feet) Pavement Rehabilitation Pavement Maintenance
Taxiways and Taxilanes	Pavement Rehabilitation (Taxiway A, D) West Hangar Taxilanes • Rehabilitation / Reconstruction (3 existing) • New Construction Pavement Maintenance	Pavement Reconstruction (Taxiway B, E, G, and section of Taxiway A where it intersects Taxiway B) Pavement Maintenance
Aircraft Aprons	Pavement Maintenance (main apron)	Pavement Reconstruction (terminal apron)
Hangars	Site Preparation (southwest hangar area)	Hangar Development Reserves
Navigational Aids and Lighting	Replacement (at end of useful life) • Visual Guidance Indicator (VASI)	Replacement (at end of useful life) • Visual Guidance Indicators (PAPI) • Runway/Taxiway Edge Lighting • Signage • Approach Lighting • ASOS • Windsocks
Fuel Storage	Secondary Containment Area(s) for Fuel Truck Parking	Bulk Fuel Storage and Dispensing Area
FBO	Identify Facility Needs/Upgrade (Building, Self-Serve Fuel Dispensing Tank)	Same
Utilities	Extend Utilities to New Development Areas	Same
Roadways & Vehicle Parking	Extend/Improve Roads to New Development Areas Add Vehicle Parking in Existing/Future Hangar Areas Construct New Service Roads to Future Development Areas	Same
Security	Maintain Existing Fencing/Gates Install New Fencing/Gates in New Development Areas	Same
-Vegetation control, crackfill, sealcoat, slurry seal, localized patching, joint rehabilitation, etc., as required.		

Airfield Capacity

Annual service volume (ASV) is a measure of estimated airport capacity and delay used for long-term planning. ASV, as defined in FAA Advisory Circular (AC) 150/5060-5, Airport Capacity and Delay, provides a reasonable estimate of an airport's operational capacity. The ratio between demand and capacity helps to define a timeline to address potential runway capacity constraints before they reach a critical point. If average delay becomes excessive (greater than 3 minutes per aircraft), significant congestion can occur on a regular basis, which significantly reduces the efficient movement of air traffic. ASV is calculated based on the runway and taxiway configuration, percent of VFR/IFR traffic, aircraft mix, lighting, instrumentation, the availability of terminal radar coverage and the level of air traffic control at an airport.

Based on the intersecting configuration of Runways 7/25 and 11/29, the FAA capacity manual credits only one active runway for the purposes of calculating capacity. For long-term planning purposes, the FAA estimates annual capacity (ASV) for a single runway with no air carrier traffic is approximately 230,000 operations; hourly capacity is estimated to be 98 operations during visual flight rules (VFR) conditions and 59 operations during instrument flight rules (IFR) conditions. Although these estimates assume optimal conditions (air traffic control, radar, etc.), they provide a reasonable basis for approximating existing and future capacity:

Existing Capacity 12,911 Annual Operations / 230,000 ASV = 5.6% (demand/capacity ratio)

Future Capacity: 17,131 Annual Operations / 230,000 ASV = 7.4% (demand/capacity ratio)

Based on these ratios, the average delay per aircraft would be expected to remain below one minute through the planning period. The FAA recommends that airports proceed with planning to provide additional capacity when 60 percent of ASV is reached. As indicated in the updated aviation activity forecasts, peak hour activity is projected to remain well below the 60 percent threshold during the planning period.

Chapter 6 – Environmental Review

Chapter 6 – Environmental Review

The Environmental Overview Memo was prepared by Mead & Hunt, a member of the Century West airport master plan team.

Introduction

The purpose of this environmental review is to identify physical or environmental conditions of record, which may affect the recommended improvements at Eastern Oregon Regional Airport.

The scope of work for this element is limited to compiling, reviewing, and briefly summarizing information of record from applicable local, federal, and state sources for the airport site and its environs. The environmental review technical memorandum is included in **Appendix D** and a brief overview is provided below.

The airport noise evaluation was conducted based on prescribed Federal Aviation Administration (FAA) guidelines, using the FAA's Integrated Noise Model (INM) computer software with several airport-specific inputs including FAA-approved air traffic forecasts, fleet mix, common aircraft flight tracks, and existing/future runway configurations.

Eastern Oregon Regional Airport is undergoing a Wildlife Hazard Assessment (WHA). The WHA will be a standalone document separate from the airport master plan.

Environmental Review

Local Site Conditions

Eastern Oregon Regional Airport is located in an area that is predominantly agriculture with wheat fields surrounding the airport.

Wetlands

Wetlands are under the jurisdiction of both the Oregon Department of State Lands (DSL) and the US Army Corps of Engineers (Corps). A wetland inventory was included in the review, which identified six wetlands in the airport vicinity (2 freshwater forested/shrub and 4 freshwater emergent). These wetlands are seasonally or temporarily flooded and characterized as drainage or runoff channels through low vegetative areas of the rolling topography native to the area.

Floodplains

A review of the flood rate insurance map for Umatilla County, Oregon shows portions of the Umatilla River floodplain is the nearest to the airport located approximately 1.3 miles south of the airport. The airport is not within the 100-year or greater floodplain.

Stormwater

The airport's stormwater runoff from the impervious runways, taxiways, aprons, and building rooftops flow into storm water collection systems. The south airfield runoff collects in a 15,000 square/foot detention pond installed with a diffuser located about 500 feet south of the main apron. From the detention pond, the water flows south through a series of outfalls and catch basins until it eventually reaches the Umatilla River. The north airfield contains two outfalls, one midfield of Runway 7/25 and the other within 1,000 feet of the Runway 11 end. Both outfalls transfer the runoff into natural drainage swales, which flow north of the airport.

Protected Species and Habitat

The U.S. Fish and Wildlife Services identified five ESA species that could potentially occur in the airport area including the Greater Sage-grouse, Yellow-billed Cuckoo, Bull Trout, Gray Wolf, and Washington Ground Squirrel. The Oregon Biodiversity Information Center indicates that there are two state threatened or endangered plant species within Umatilla Basin, including the Northern wormwood and Laurence's Milk-vetch.

Airport Noise Analysis

Airport Noise and Noise Modeling

It is often noted that noise is the most common negative impact associated with airports. A simple definition of noise is "unwanted sound." However, sound is measurable, whereas noise is subjective. The relationship between measurable sound and human irritation is the key to understanding aircraft noise impact. A rating scale has been devised to relate sound to the sensitivity of the human ear. The A-weighted decibel scale (dBA) is measured on a "log" scale, by which is meant that for each increase in sound energy level by a factor of 10, there is a designated increase of 1 dBA. This system of measurement is used because the human ear functions over such an enormous range of sound energy impacts. At a psychological level, there is a rule of thumb that the human ear often "hears" an increase of 10 decibels as equivalent to a "doubling" of sound.

The challenge to evaluating noise impact lies in determining what amount and what kind of sound constitutes noise. The vast majority of people exposed to aircraft noise are not in danger of direct physical harm. However, much research on the effects of noise has led to several generally accepted conclusions:

- The effects of sound are cumulative; therefore, the duration of exposure must be included in any evaluation of noise.
- Noise can interfere with outdoor activities and other communication.
- Noise can disturb sleep, TV/radio listening, and relaxation.
- When community noise levels have reached sufficient intensity, community wide objection to the noise will likely occur.

Research has also found that individual responses to noise are difficult to predict.[1] Some people are annoyed by perceptible noise events, while others show little concern over the most disruptive events. However, it is possible to predict the responses of large groups of people – i.e. communities. Consequently, community response, not individual response, has emerged as the prime index of aircraft noise measurement.

On the basis of the findings described above, a methodology has been devised to relate measurable sound from a variety of sources to community response. For aviation noise analysis, the FAA has determined that the cumulative noise energy exposure of individuals to noise resulting from aviation activities must be established in terms of yearly day/night average sound level (DNL) as FAA's primary metric. The DNL methodology is used in conjunction with the standard A-weighted decibel scale (dBA) which is measured on a "log" scale, by which is meant that for each increase in sound energy level by a factor of 10, there is a designated increase of 1 dBA. DNL has been adopted by the U. S. Environmental Protection Agency (EPA), the Department of Housing and Urban Development (HUD), and the Federal Aviation Administration

[1] Beranek, Leo, *Noise and Vibration Control*, McGraw-Hill, 1971, pages ix-x.

(FAA) for use in evaluating noise impacts. In a general sense, it is the yearly average of aircraft-created noise for a specific location (i.e., runway), but includes a calculation penalty for each night flight.

The FAA has determined that a significant noise impact would occur if analysis shows that the proposed action will cause noise sensitive areas to experience an increase in noise of DNL 1.5 dB or more at or above DNL 65 dB noise exposure when compared to the no action alternative for the same time frame. As an example, an increase from 63.5 dB to 65 dB is considered a significant impact. The DNL methodology also includes a significant calculation penalty for each night flight. DNL levels are normally depicted as contours. These contours are generated from noise measurements processed by a FAA-approved computer noise model. They are superimposed on a map of the airport and its surrounding area. This map of noise contour levels is used to predict community response to the noise generated from aircraft using that airport.

The basic unit in the computation of DNL is the sound exposure level (SEL). An SEL is computed by mathematically summing the dBA level for each second during which a noise event occurs. For example, the noise level of an aircraft might be recorded as it approaches, passes overhead, and then departs. The recorded noise level of each second of the noise event is then added logarithmically to compute the SEL. To provide a penalty for nighttime flights (considered to be between 10 PM and 7 AM), 10 dBA is added to each nighttime dBA measurement, second by second. Due to the mathematics of logarithms, this calculation penalty is equivalent to 10-day flights for each night flight.

A DNL level is approximately equal to the average dBA level during a 24-hour period with a weighting for nighttime noise events. The main advantage of DNL is that it provides a common measure for a variety of different noise environments. The same DNL level can describe an area with very few high noise events as well as an area with many low-level events.

Noise Modeling and Contour Criteria

DNL levels are typically depicted as contours. Contours are an interpolation of noise levels drawn to connect all points of a constant level, which are derived from information processed by the FAA-approved computer noise model. They appear similar to topographical contours and are superimposed on a map of the airport and its surrounding area. It is this map of noise levels drawn about an airport, which is used to predict community response to the noise from aircraft using that airport. DNL mapping is best used for comparative purposes, rather than for providing absolute values. That is, valid comparisons can be made between scenarios as long as consistent assumptions and basic data are used for all calculations. It should be noted that a line drawn on a map by a computer does not imply that a particular noise condition exists on one side of the line and not on the other. These calculations can only be used for comparing average noise impacts, not precisely defining them relative to a specific location at a specific time.

Noise and Land-Use Compatibility Criteria

Federal regulatory agencies of government have adopted standards and suggested guidelines relating DNL to compatible land uses. Most of the noise and land-use compatibility guidelines strongly support the concept that significant annoyance from aircraft noise levels does not occur outside a 65 DNL noise contour. Federal agencies supporting this concept include the Environmental Protection Agency, Department of Housing and Urban Development, and the Federal Aviation Administration.

Federal Aviation Regulations (FAR) Part 150, Airport Noise Compatibility Planning provides guidance for land-use compatibility around airports. Under federal guidelines, all land uses, including residential, are considered compatible with noise exposure levels of 65 DNL and lower. Generally, residential and some public uses are not compatible within the 65-70 DNL, and above. As noted in this table, some degree of noise level reduction (NLR) from outdoor to indoor environments may be required for specific land uses located within higher-level noise contours. Land uses such as commercial, manufacturing, some recreational uses, and agriculture are compatible within 65-70 DNL contours.

Residential development within the 65 DNL contour and above is not recommended and should be discouraged. Care should be taken by local land use authorities to avoid creating potential long-term land use incompatibilities in the vicinity of the airport by permitting new development of incompatible land uses such as residential subdivisions in areas of moderate or higher noise exposure.

Planning Period Noise Contours

A noise analysis of the effects of existing aircraft operations and proposed projects/activities linked to the updated airport master plan has been performed using the FAA's Integrated Noise Model (INM), version 7.0D. The INM data runs are included in **Appendix E.**

The noise contours and associated information have been developed to assess current and future aircraft noise exposure and support local land use compatibility planning. Data from the updated forecasts of activity levels were assigned to the common arrival, departure and airport traffic pattern flight tracks defined for the runways. The existing and future noise contours were generated based on the FAA-approved master plan aircraft operations forecast for 2015, 2020, and 2025.

Figure 6-1 Noise Contours

Chapter 7 – Airport Development Alternatives

Chapter 7 – Airport Development Alternatives

The evaluation of future development options represents a critical step in the airport master planning process. The primary goal is to define a path for future development that provides an efficient use of resources and is capable of accommodating the forecast demand and facility needs defined in the master plan.

Note: The airport alternative evaluation presented in this chapter maintains the original sequence of events (preliminary alternatives, preferred alternative, etc.) presented in the draft working papers. References to anticipated events in the evaluation process leading to the selection of the preferred alternative have not been modified to reflect subsequent decisions made by FAA or the City of Pendleton.

Introduction

As noted in the facility requirements evaluation, current and long-term planning for Eastern Oregon Regional Airport is based on maintaining and improving the airport's ability to serve a wide range of commercial, general aviation, business aviation, and military aircraft. The airport facilities accommodate a wide variety of aircraft types including conventional fixed wing and rotor, and a new category of unmanned aerial systems (UAS). This unique mix of aircraft activity requires facility improvements capable of accommodating demand while maintaining air safety for all users.

UAS activity at Eastern Oregon Regional Airport is controlled by the air traffic control tower (ATCT) and included in overall airport traffic counts. UAS aircraft operating under ATCT control are recognized by FAA as an established aeronautical use. The master planning evaluations assume that all FAA-recognized aeronautical activities are subject to the same project eligibility criteria for funding. There are currently no

FAA design standards specifically developed for UAS airside facility planning. For this master planning process, existing FAA design standards for comparably-size conventional aircraft (Airplane Design Group I or II) will be used to define operating areas (runways, taxiways, etc.).

The alternatives will address current and future facility demands and FAA airport design requirements. All proposed facility improvements are consistent with applicable FAA airport design standards and FAR Part 77 airspace planning standards.

Evaluation Process

Creating preliminary alternatives represents the first step in a multi-step process that leads to the selection of a preferred alternative. It is important to note that the current FAA-approved airport layout plan (ALP) identifies future improvements recommended in the last master planning process. The master plan update provides a fresh look at addressing facility needs, but also allows the components of the previous preferred alternative to be retained or modified, if they meet current needs.

The preliminary alternatives are created to respond to defined facility needs, with the goal identifying general preferences for both individual items and the overall concepts being presented. The process will allow the widest range of ideas to be considered and the most effective facility development concept to be defined.

From this evaluation process, elements of a preferred alternative will emerge that can best accommodate all required facility improvements. Based on the preferences of the airport sponsor, the Consultant will consolidate these elements into a draft preferred alternative that can be refined further as the City proceeds through the process of finalizing the remaining elements of the airport master plan. Throughout this process, public input and coordination with the Planning Advisory Committee (PAC), FAA, and ODA will also help to shape the preferred alternative.

Once the preferred alternative is selected by the City of Pendleton, a detailed capital improvement program will be created that identifies and prioritizes specific projects to be implemented. The elements of the preferred alternative will be integrated into the updated ALP drawings that will guide future improvements at the airport.

No-Action Alternative

In addition to proactive options that are designed to respond to defined future facility needs, a "no-action" option also exists, in which the City of Pendleton may choose to maintain existing facilities and capabilities without investing in facility upgrades or expansion to address future demand. The existing airfield configuration would remain unchanged from its present configuration and the airport would essentially be operated in a "maintenance-only" mode.

The primary result of this alternative would be the inability of the airport to accommodate aviation demand beyond current facility capabilities. Future aviation activity would eventually be constrained by the capacity, safety, and operational limits of the existing airport facilities. In addition, the absence of new facility development effectively limits the airport sponsor's ability to increase airport revenues and operate the airport on a financially sustainable basis over the long term.

The no-action alternative establishes a baseline from which the action alternatives can be developed and compared. The purpose and need for the action alternatives are defined by the findings of the forecasts and facilities requirements analyses. The factors associated with both current and future aircraft activity (potential for congestion, safety, etc.) are the underlying rationale for making facility improvements. Market factors (demand) effectively determine the level and pace of private investment (hangar construction, business relocation to the airport, etc.) at an airport. Public investment in facilities is driven by safety, capacity, and the ability to operate an airport on a financially sustainable basis.

Based on the factors noted above, the no-action alternative is inconsistent with the management and development policies established by the City of Pendleton and its long-established commitment to provide a safe and efficient air transportation facility to serve northeastern Oregon and surrounding areas that is socially, environmentally, and economically sustainable.

Preliminary Development Alternatives

The preliminary alternatives are intended to facilitate a discussion and evaluation about the most efficient way to meet the facility needs of the airport. The facility needs identified in the previous chapter include a variety of airside (runway-taxiway) and landside needs (aircraft parking, hangars, fueling, terminal, FBO facilities, etc.). Unmanned aerial system (UAS) facility needs include both airside and landside facilities. Items such as fencing, lighting improvements, minor roadway extensions and pavement maintenance do not typically require an alternatives analysis and will be incorporated into the preferred development alternative and the ALP. The preliminary alternatives have been organized into several groups:

- Airside Development Options (Runway-Taxiway System)
- Landside Improvement Options (West Hangar Area)
- Terminal Area/Main Apron Improvement Options
- UAS Improvements
- Terminal Building Layout Options

The preliminary development alternatives are described below with graphic depictions (**Figures 7-1 through 7-13**) provided to illustrate the key elements of each alternative.

It is important to note that the eventual preferred alternative selected by the City may come from one of the preliminary alternatives, a combination or hybrid of the preliminary alternatives, or a new concept that evolves through the evaluation and discussion of the preliminary alternatives. As noted earlier, the City of Pendleton also has the option of limiting future facility improvements based on financial considerations or development limitations.

Airside Development Alternatives (Runway-Taxiway Improvements)

Overview

As noted in the Facility Requirements chapter, both runways (Runway 7/25 and Runway 11/29) are capable of accommodating the future design aircraft (multi-engine turboprop, above 12,500 pounds) and both civilian and military transport category aircraft. The City of Pendleton has expressed its desire to maintain existing airfield facilities and capabilities to greatest extent feasible, but is dependent on continued FAA support to maintain facilities that have historically been constructed or rehabilitated with FAA funds.

The FAA's historic and ongoing investments in the runways and taxiways, including the instrument landing system (ILS) and approach lighting system on Runway 25, are significant and reflect a dedicated system wide approach to managing strategic aeronautical facilities.

The FAA review of the draft facility requirements chapter noted that the crosswind coverage on Runway 7/25 exceeds the FAA standard of 95 percent, which makes Runway 11/29 ineligible for FAA funding, when solely based on runway wind coverage criteria. The FAA wind coverage criteria is well established, albeit not previously applied to Runway 11/29. The airport master plans and FAA-approved airport layout plan drawings for Eastern Oregon Regional Airport dating back to the 1970s or earlier have not indicated any intent to reduce or eliminate FAA funding for Runway 11/29 due to the wind coverage provided by the primary runway (7/25). On the contrary, several FAA-funded projects including a 1999 major rehabilitation/overlay and periodic pavement maintenance and runway marking projects have been completed on Runway 11/29 during this period.

A change in FAA participation in Runway 11/29 would severely limit the City's ability to maintain the runway in a safe operational condition. The ability to offset a loss of FAA funding with a combination of City and State (ODA or Oregon Military Department) funding, or through Congressional funding is unknown.

However, in the absence of available funding, the scenario could eventually lead to the closure of Runway 11/29 once the pavement condition deteriorates below acceptable levels. From an operational standpoint, a closure of Runway 11/29 would significantly increase aircraft taxiing distances between the terminal and other landside facilities and Runway 7/25. Based simply on the additional taxiing distances and corresponding time involved, aviation fuel consumption and carbon dioxide ($C0_2$) emissions would be expected to increase four-fold for any given volume of traffic, when compared to current runway use and ground movements. Additional environmental analyses are recommended to evaluate net changes in greenhouse gas emissions and impacts on local air quality that would result from such a runway closure. It is suggested that the FAA's evaluation of funding eligibility for Runway 11/29 also consider operational and environmental factors as part of formulation of a future project. In the interim, the master planning evaluations for the runway–taxiway system will focus on maintaining the function provided by both runways.

A section of Taxiway B located north of Taxiway A and the intersection of Runway 7/25 and 11/29 provides a direct path between the Oregon National Guard apron and the runways. The FAA has identified uninterrupted straight-line taxi routes between landside facilities and runways as contributor to runway incursions. The FAA's current design guidance encourages taxi routes that require distinct changes in aircraft direction when entering the runway environment as a way to increase situational awareness for pilots. Based on the unique runway and taxiway geometry in this area, options for relocating Taxiway B are limited, and may require alternative access routes to the runways via existing or future parallel taxiway connections.

RUNWAY 7/25 (PRIMARY RUNWAY)

The existing length (6,300 feet) and width (150 feet) of Runway 7/25 is maintained in each of the airside development alternatives. Preserving the current runway-taxiway dimensions and their associated protected areas and development setbacks, was recommended in the updated facility requirements chapter based on operational needs of the airport and the broader functional requirements of the Oregon and national airport system.

The 2002 ALP drawing depicts a future 2,000-foot extension at the west end of Runway 7/25.[1] This recommendation is not maintained in the preliminary alternatives, based on the updated forecast activity in the twenty-year planning period.

RUNWAY 11/29 (CROSSWIND/SECONDARY RUNWAY)

As the airport's secondary runway, the updated facility requirements assessment of Runway 11/29 recommends length and width dimensions consistent with the requirements of the future ADG II design aircraft. This width standard is used in the airside options involving reconfiguration; the existing runway width may be maintained in "maintenance-only" options. The proposed runway lengths vary depending on the option.

[1] 2002 ALP Drawing, as amended (as-built ALP updated in 2007)

It is assumed that the existing runway will be maintained until the next major rehabilitation project is required. It is important to note that narrowing the runway from 100 feet to 75 feet will also require the replacement/relocation of existing runway edge lighting and may trigger other changes in taxiway fillet design, gradients, etc.

Three proposed airside development alternatives are depicted in **Figures 7-1, 7-2, and 7-3**.

Airside Alternative A

Airside Alternative A (see Figure 7-1) is a modified version of the previous airport master plan's recommended improvements that are depicted on the 2002 FAA-approved Airport Layout Plan (ALP). The main elements are largely unchanged to allow comparison with the other airside options being considered. However, items that are no longer consistent with the updated facility requirements assessment have been modified or eliminated.

The most significant element in this option is a proposed 2,000-foot northward shift of Runway 11/29 that would maintain the current 5,581-foot runway length. The previous recommendation to extend the parallel taxiway (Taxiway A) to the future north end of Runway 11/29 is maintained. This option also addresses an FAA-identified Hotspot[2] (area of potential conflict or confusing geometry) located near the existing Runway 29 threshold and the intersection of Taxiways A, D and E.

Based on review of the previous master plan, the primary justification for changing the Runway 11/29 configuration was to eliminate a transitional surface (FAR Part 77) penetration caused by the airport terminal building. By shifting the end of Runway 29 northward, the transitional surface penetration is eliminated. However, as a result of the runway shift, the terminal building will then be located partially beneath the Runway 29 approach surface. The proposed 2,000-foot relocation of the Runway 29 threshold provides adequate obstruction clearance for the current and future approach surface. It is noted that the 2002 ALP and airspace plan drawings depict a recommended reduction in the approach visibility requirements for Runway 29 (reduced to ¾-mile), which triggered a larger runway protection zone (RPZ) and wider approach surface, both of which were factors in determining the relocated threshold location. As noted in the updated facility requirements assessment, this recommendation is not being maintained since it would require installation of an approach lighting system to obtain the reduced approach minimums, and the upgrade is redundant to the approach minimums and required approach lighting systems already in place on Runway 7/25.

[2] Eastern Oregon Regional Airport Hotspot "The hold line for Rwy 29 extends across a portion of the ramp and is approximately 360' long. The signs are difficult to see from some spots on the ramp."

It is also noted that the reconfiguration does not consider the clearance requirements for the 40:1 TERPS instrument departure surface that extends south of Runway 29. If this option is maintained in the updated preferred alternative, the TERPS departure surface penetration will need to be addressed.

The proposed change in runway configuration eliminates the current reductions in useable lengths on Runway 11/29 (represented as declared distances) currently required by the non-standard runway safety area (RSA) located beyond the end of Runway 29.

No changes to Runway 7/25 are proposed, although taxiway access improvements to Runway 7/25 are included. New taxiway access from the main apron is configured to align with the relocated end of Runway 29, then extend to Taxiway G, and to Runway 7/25, near mid runway.

The reconfiguration of Runway 11/29 and the associated taxiways include removing sections of decommissioned pavement (the former section of Runway 11/29, the south end of Taxiway G, the Taxiway D and E connections to the runway and Taxiway G, and a small section of the terminal apron immediately abutting the west side of the former runway).

The proposed UAS runway is intended to allow improved separation between conventional aircraft and UAS aircraft. The proposed runway is located 700 feet north, and parallel to Runway 7/25, which meets the FAA standards for accommodating simultaneous operations during visual flight rules (VFR) conditions. The UAS runway would be accessed from Taxiway G and adjacent UAS development planned for the north side of the airport. See **Figure 7-10** for additional UAS facility detail.

The primary elements of Airside Alternative A include:

- Shift Runway 11/29 2,000 feet north:
  - Relocate the Runway 29 end 2,000 feet to the north (eliminate Runway 29 displaced threshold)
  - Construct a 2,000-foot runway extension at north end
  - Narrow runway from 100 to 75 feet; replace runway lighting
  - Remove existing runway pavement south of relocated Runway 29 end;
- Remove existing pavement (Taxiway E, the eastern section of Taxiway D, and the south section of Taxiway G);
- Extend the parallel taxiway for Runway 11/29 (north section);
- Construct new Runway 7/25 exit taxiway (mid-runway) and new section of south parallel taxiway for Runway 7/25;
- Construct new access taxiway between the main apron/Taxiway D and Taxiway G, with connection to the relocated Runway 29 threshold and the new Runway 7/25 exit taxiway;

- Remove section of Taxiway B (connection between Runway 7/25 & 11/29 intersection and Taxiway A); and
- Construct new UAS runway, north of Runway 7-25 and west of Taxiway G.

Airside Alternative B

Airside Alternative B (see Figure 7-2) also addresses the terminal building transitional surface penetration for Runway 11/29 by relocating the Runway 29 threshold 913 feet north. As a cost savings measure, this option does not include an extension at the north end of the runway, which reduces future runway length to 4,668 feet. This runway length is adequate for the ADG II design aircraft under most conditions.

This option reduces the terminal building transitional surface penetration and avoids the approach surface and runway protection zone (RPZ) for Runway 29. As with Airside Alternative A, the terminal building will penetrate the 40:1 TERPS instrument departure surface that extends south of Runway 29. If this option emerges as a viable alternative, the TERPS departure surface penetration will need to be addressed.

This option also eliminates the FAA-defined Hotspot located near the current Runway 29 threshold and provides efficient taxiway access to the relocated Runway 29 threshold and Taxiway G.

An additional access taxiway is depicted extending between the ends of Runway 7 and Runway 11, with two options for runway separation (ADG III and ADG II) for the section paralleling Runway 11/29. The other proposed improvements in Alternative A are maintained and no changes to Runway 7/25 are included.

The primary elements of Airside Alternative B include:

- Reconfigure Runway 11/29 (4,668 x 75 feet):
  - Relocate the Runway 29 end 913 feet to the north (eliminate Runway 29 displaced threshold)
  - Narrow runway from 100 to 75 feet; replace runway lighting
  - Remove existing runway pavement south of relocated Runway 29 end;
- Reconfigure taxiway access to relocated Runway 29 threshold;
- Remove existing pavement (Taxiway E, the eastern section of Taxiway D, and the south section of Taxiway G);
- Extend the parallel taxiway for Runway 11/29 (north section);
- Construct new Runway 7/25 exit taxiway (mid-runway) and new section of south parallel taxiway for Runway 7/25;
- Construct new access taxiway between the main apron/Taxiway D and Taxiway G and the new Runway 7/25 exit taxiway;

- Construct new access taxiway between Runway 7 and Runway 11 threshold (independent of Runway 11/29 parallel taxiway option);
- Remove section of Taxiway B (connection between Runway 7/25 & 11/29 intersection and Taxiway A); and
- Construct new UAS runway, north of Runway 7-25 and west of Taxiway G.

Airside Alternative C

Airside Alternative C (see Figure 7-3) maintains the existing configuration (length, width, and location) of Runway 11/29 and 7/25. This option maintains the runways in place and addresses the FAA-identified Hotspot near the Runway 29 threshold and the Taxiway B design issue noted in the previous alternatives.

If FAA funding was made available for Runway 11/29, a future rehabilitation project may involve narrowing the runway and replacing the runway lights. Without FAA funding, the project focus would be to maintain a safe operating surface with no changes to the existing runway configuration.

This option does not change the existing terminal building penetration to the Runway 11/29 transitional surface; obstruction lighting is recommended. The primary benefits of maintaining the current configuration for Runway 11/29 is the Runway 29 approach surface and the TERPS departure surface extending beyond the south end of the runway remain unobstructed. The terminal building is also located outside the arrival and departure runway protection zones (RPZ) for Runway 29.

Sections of apron/taxiway pavement located adjacent to the Runway 29 threshold (south of Taxiway D) would be removed to mitigate the FAA Hotspot by improving visual recognition of taxiway routes. Additional taxiway refinements (improved fillets, etc.) are recommended to address the sharp intersection at Taxiway A and Runway 11/29. The other taxiway improvements included in Airside Alternative B are maintained in Airside Alternative C.

The elements of Airside Alternative C include:

- Maintain Runways 7/25 and 11/29 in current configuration;
- Remove pavement between Runway 29 end and terminal apron to improve visual identification of runway-taxiway environment;
- Extend the parallel taxiway for Runway 11/29 (north section);
- Construct new Runway 7/25 exit taxiway (mid-runway) and new section of south parallel taxiway for Runway 7/25;
- Construct new access taxiway between the main apron/Taxiway D and Taxiway G and the new Runway 7/25 exit taxiway;

- Construct new access taxiway between Runway 7 and Runway 11 threshold (independent of Runway 11/29 parallel taxiway option);
- Remove section of Taxiway B (connection between Runway 7/25 & 11/29 intersection and Taxiway A); and
- Construct new UAS runway, north of Runway 7-25 and west of Taxiway G.

Figure 7-1 Airside Alternative A

Figure 7-2 Airside Alternative B

Figure 7-3 Airside Alternative C

Preliminary Landside Development Alternatives

Eastern Oregon Regional Airport has a large quantity of land available to support future landside facility development. The airport's existing landside development is located south of the runway-taxiway system and accommodates all existing aircraft parking and hangars, air cargo loading, helicopter parking, aircraft fueling, and a variety of tenant facilities. The airport terminal building is located at the east end of the flight line, directly adjacent to Runway 11/29.

Future landside facility needs identified in the updated facility requirements assessment include addition hangars, expanded/upgraded fixed base operator (FBO) facilities, expanded aircraft fuel storage and dispensing facilities, and designated parking for transient business aircraft, air cargo aircraft and helicopters. Support facilities for UAS tenants will initially be located in the south landside area with longer term development planned north of Runway 7/25.

After an extended period of no aviation related hangar construction activity that coincided with the Great Recession, two new hangar projects were constructed in 2016. The airport's locally based air ambulance operator (Life Flight) constructed their new hangar near the northwest corner of the apron (north of Taxiway D), capable of accommodating both helicopter (AugustaWestland AW119 Koala) and fixed wing aircraft (Pilatus PC-12). A new City-owned flexible use hangar is located immediately west of the Life Flight hangar.

Three landside development alternatives (see **Figures 7-4, 7-5 and 7-6**) were developed that focus on the west end of the main apron as the primary hangar development area, which is consistent with the 2002 airport layout plan (ALP). The proposed development area has naturally sloping terrain (downward) that extends from NW 56th Street and the northwest corner of the site toward more level ground to the east and southeast. It is anticipated that the areas requiring the least excavation and leveling will be constructed first, with additional areas added over time.

The preliminary landside development alternatives include the conceptual layout for the area depicted on the 2002 airport layout plan (ALP) and two new layouts. The proposed improvements include a combination of conventional and T-hangars for aircraft storage, commercial hangars, new taxilanes, aircraft apron (fronting conventional hangars), new or updated vehicle access and parking, reconfigured fencing, vehicle gates, and development reserves.

The proposed hangar development area will accommodate a mix of both ADG I and II aircraft. Primary aircraft access to this area is provided by extending Taxiway D (as a Taxilane) from its current west end (adjacent the new Life Flight hangar). The western taxilane extension is designed to meet ADG II standards and will provide access to larger hangars located along the north side of the taxilane. Additional taxilanes intended to serve small aircraft hangars will be designed to meet ADG I standards.

Landside Development Alternative A

Landside Development Alternative A (see Figure 7-4) locates new conventional hangars north of Taxiway D and concentrates multi-unit hangar development to the south.

This option locates a single row of conventional hangars along the north side of the Taxiway D and the future western extension (to be designated Taxilane D). The northern row will accommodate commercial hangars and aircraft storage hangars, with dedicated road access provided by a connection to NW 56th Street. The existing unimproved access road that extends east from NW 56th Street will be upgraded and extended. Changes to existing fencing and new controlled access gates are required as part of the overall development. Vehicle parking is provided near commercial and aircraft storage hangars.

As currently depicted, the northern hangar row includes the Life Flight and new Flex hangar, two additional smaller commercial hangars, nine small conventional hangars (50' x 50' typ.) near the northwest corner of the main apron, and five small conventional hangars (50' x 50' typ.) near the northwest corner of the site. The hangar sites located in the western section of the area have adequate clearances from Taxilane D to accommodate small apron areas in front of the hangars for aircraft ground operations. The hangar sites located in the eastern section are served by a dedicated taxilane that would be constructed north, and parallel to Taxiway D.

The proposed hangar development on the south side of Taxiway/Taxilane D includes four multi-unit hangars with storage capacity of approximately 42 aircraft (depending on building configuration), and a row of small conventional hangars (6 depicted) along the south edge of the development. The taxilanes and hangars sites would be developed incrementally based on demand. The south hangar development area is served by a series of connected taxilanes that are designed to provide multiple access routes to/from the main apron. Development reserves are identified that can accommodate additional hangars, vehicle parking, and access roads.

The elements of Landside Development Alternative A include:

- Access road improvements (connecting NW 56th Street to north hangar sites);
- North Hangar Row - conventional hangar sites (located north of Taxiway/Taxilane D, east and west of Life Flight hangar);
- West extension of Taxiway D (ADG II taxilane);
- New ADG I taxilanes serving T-hangars;
- Aircraft Storage Hangars – sites for four 10/12-unit T-hangars (42 units total +/-) and small conventional hangars (6 sites depicted);
- Vehicle parking;
- New airport security fencing and gates; and
- Development reserve area.

Landside Development Alternative B

Landside Development Alternative B (see Figure 7-5) concentrates all new hangar development west of the main apron. The proposed north row of hangar development is similar to Alternative A, with the exception of locating conventional hangars north of the main apron. In this option, the small conventional hangars are located along the western and southern edges of the development. The proposed multi-unit hangar development south of Taxiway/Taxilane D is unchanged from Alternative A. The proposed improvements for vehicle access, parking and fencing depicted in Alternative A are maintained.

The elements of Landside Development Alternative B include:

- Access road improvements (connecting NW 56th Street to north hangar sites);
- North Hangar Row - conventional hangar sites (located north of extended Taxilane D, west of Life Flight hangar);
- West extension of Taxiway D (ADG II taxilane);
- New ADG I taxilanes serving T-hangars;
- Aircraft Storage Hangars – sites for four 10/12-unit T-hangars (42 units total +/-) and small conventional hangars (6 sites depicted);
- Vehicle parking;
- New airport security fencing and gates; and
- Development reserve area.

Landside Development Alternative C

Landside Development Alternative C (see Figure 7-6) is a modified version of the preferred alternative depicted on the 2002 Airport Layout Plan. The original hangar development concept was modified to accommodate construction of the Life Flight hangar, the city Flex hangar, and the access road upgrade from NW 56th Street. These elements are assumed to be "existing conditions" in the updated version. The proposed hangar taxilanes have also been modified or realigned slightly to meet FAA design standards.

The primary distinctions between Alternative C and the previous landside alternatives is the concentration on accommodating more small conventional hangars (19 depicted). Two multi-unit hangars (20-22 units) are located along the south side of Taxiway D. The south hangar development area is served by a series of stub taxilanes that connect to the main access taxilane and one existing T-hangar stub taxilane.

The elements of Landside Development Alternative B include:

- Access road improvements (connecting NW 56th Street to north hangar sites);
- West extension of Taxiway D (ADG II taxilane);
- Aircraft Storage Hangars – sites for two 10/12-unit T-hangars (22 units total +/-) and small conventional hangars (19 sites depicted);
- Upgraded Access Road (connecting to NW A Street to southern hangar sites)
- North Hangar Row - conventional hangar site and development reserve (located north of extended Taxilane D, west of Life Flight hangar);
- New ADG I taxilanes serving small conventional hangars;
- Vehicle parking; and
- New airport security fencing and gates.

Insert Figure 7-4 Landside Development Alternative A

Insert Figure 7-5 Landside Development Alternative B

Insert Figure 7-6 Landside Development Alternative C

Main Apron Alternatives

Three proposed reconfiguration alternatives were developed for the main apron and surrounding areas. The existing apron has sufficient space to accommodate current and forecast activity and no expansion of the apron is required. The available area immediately adjacent to the apron (south) also appears to be sufficient to accommodate current and projected building and related facility needs. Redevelopment or infill development within the south flight line abutting the main apron is recommended to increase land use efficiency and improve the visual impression along NW A Street.

The goal of these alternatives is to accommodate the wide range (current and future) of activities and facilities found in the terminal area including:

- Fixed Base Operator (FBO) Building;
- Aircraft Fuel Storage and Dispensing Facilities;
- Drive-through Parking for Transient Business Aircraft;
- Air Cargo Building/Operations Area;
- Air Cargo and Large Aircraft Parking;
- Snow Removal Equipment (SRE) Building ; and
- Building Removal (optional).

In each of the alternatives, the terminal apron is marked with two designated parking positions, which can accommodate two Cessna Caravan or Saab 340 aircraft, or one larger transport category aircraft. A new ADG II taxilane is designated connecting Taxiway D to the terminal apron parking positions. In order to accommodate the new taxilane and two aircraft parking positions, the non-movement area boundary marking between the intersection of Taxiway A, D, and E and the terminal building would be relocated along the edge of the OFA for Taxiway D.

The existing small airplane tiedowns located at the west end of the main apron are unchanged. Six additional tiedowns are added to the eastern-most tiedown row in each of the apron options.

Main Apron - Alternative 1

Main Apron Alternative 1 (see **Figure 7-7**) consolidates general aviation facilities in the center section of the apron. The elements of Main Apron Alternative 1 include:

- Relocate items currently located on the apron to accommodate apron reconfiguration:
    - FBO building
    - Aviation fuel tank and pump
    - Equipment storage and parked vehicles adjacent to FBO
    - City T-hangar
    - Small conventional hangar;
- Reconfigure/designate ADG II taxilanes for aircraft parking areas, EAA hangar, and terminal;
- Transient drive through parking positions (4) for business aircraft;
- Air cargo drive through parking position sized for one ATR-72 or two smaller cargo aircraft with loading area;
- Designated large aircraft parking areas (150'x150' and 200'x200') for transient military and civilian aircraft such as C130, C17 or CH-47;
- Relocated and expanded above ground aviation fuel storage and dispensing area (Jet-A and AVGAS);
- New/relocated FBO building and operations area (south of apron & fence line);
- Cargo building and operations area (south of apron & fence line);
- Vehicle parking and circulation improvements (south of apron & fence line); and
- Snow removal equipment (SRE) building (new).

The main objective in this option is to reduce congestion on the existing apron by relocating support facilities to the back of the apron (south edge). New buildings will be constructed outside the fence, adjacent to the south edge of the apron. This will allow adequate clearances for aircraft parking, fueling areas, and buildings.

Main Apron - Alternative 2

Main Apron Alternative 2 (see **Figure 7-8**) also consolidates general aviation facilities in the center section of the apron, but does not remove the three existing buildings currently located on the apron. All new buildings will be constructed outside the fence, adjacent to the south edge of the apron. The option provides both a relocated fuel island (adjacent to the FBO) and a second location identified for a common use aircraft fuel island on the north side of the EAA hangar. The proposed snow removal equipment (SRE) building is located near the southwest corner of the EAA hangar, adjacent to the airport's ARFF and equipment storage buildings. Air cargo and other commercial development areas are located east of the FBO building. Alternative 2 locates the air cargo aircraft parking position and operations area the western-most row, with three drive through parking rows located further east. The apron taxilanes are reconfigured to accommodate the existing buildings located on the apron and to meet applicable FAA design standards.

The elements of Main Apron Alternative 2 include:

- Maintain existing hangars and FBO building located on main apron;
- Relocate items currently located on the apron to accommodate apron reconfiguration:
    - Aviation fuel tank and pump
    - Equipment storage and parked vehicles adjacent to FBO;
- Reconfigure/designate ADG II taxilanes for aircraft parking areas, EAA hangar, and terminal;
- Transient drive through parking positions (6) for business aircraft;
- Air cargo drive through parking position sized for one ATR-72 or two smaller cargo aircraft with loading area;
- Designated large aircraft parking area (200'x250') for transient military and civilian aircraft such as C130, C17 or CH-47;
- Relocated above ground aviation fuel storage and dispensing area (AVGAS and Jet-A);
- New above ground aviation fuel storage and dispensing area (Jet-A and AVGAS);
- Cargo building and operations area (south of apron & fence line);
- Vehicle parking and circulation improvements (south of apron & fence line);
- Snow removal equipment (SRE) building (new); and
- Aviation related commercial/industrial building site.

Main Apron - Alternative 3

Main Apron Alternative 3 (see **Figure 7-9**) provides a similar layout as Alternative 1 for the FBO, transient business aircraft parking, air cargo facilities, and aircraft parking in the center section of the apron. This option also includes removal of existing buildings/hangars located on the main apron. The proposed configuration for the east end of the main apron locates transient aircraft parking and aircraft fueling closer to the terminal building to provide more convenient access to FBO operations that may be located in the terminal. The proposed SRE building is located near the east end of main apron, adjacent to the southeast corner of the EAA hangar. The elements of Main Apron Alternative 3 include:

- Relocate items currently located on the apron to accommodate apron reconfiguration:
    - FBO building
    - Aviation fuel tank and pump
    - Equipment storage and parked vehicles adjacent to FBO
    - City T-hangar
    - Small conventional hangar;

- Reconfigure/designate ADG II taxilanes for aircraft parking areas, EAA hangar, and terminal;
- Transient drive through parking positions (6) for business aircraft (west row in front of FBO);
- Air cargo drive through parking position sized for two ATR-72 cargo aircraft with loading area;
- Designated large aircraft parking area (200'x200') for transient military and civilian aircraft such as C130, C17 or CH-47;
- Relocated and expanded above ground aviation fuel storage and dispensing area (Jet-A and AVGAS);
- New/relocated FBO building and operations area (south of apron & fence line);
- Cargo building and operations area (south of apron & fence line);
- Vehicle parking and circulation improvements (south of apron & fence line); and
- Snow removal equipment (SRE) building (new).

Figure 7-7 Main Apron Alternative 1

Figure 7-8 Main Apron Alternative 2

Figure 7-9 Main Apron Alternative 3

UAS Development Alternative

The **UAS Development Alternative** (see **Figure 7-10**) includes both airside and landside development associated with a planned UAS Research and Operations Park. The airside elements include a UAS dedicated runway located north of Runway 7/25. This runway will have a parallel taxiway, designed to meet FAA ADG-I design standards. The UAS runway to Runway 7/25 separation is 700 feet, which meets design standards for visual flight rules (VFR) simultaneous operations.

The UAS landside area will include an aircraft and UAS apron area, UAS launch pads, UAS Tower, and space available for hangars and commercial buildings. Additional information on UAS facilities is included in Chapter 4, Unmanned Aircraft Systems Evaluation.

The elements of North UAS Development Area Alternative include:

- Construct an 1,800-foot long (optional 2,800-foot) by 60 feet wide UAS designated runway north of Runway 7/25;
- Construct a north parallel taxiway for the UAS runway;
- ADG I (visual) design standards for UAS runway-taxiway facilities;
- A variety of landside facilities are planned north of the UAS runway and parallel taxiway:
  - Construct designated UAS launch pads (50'x50')
  - Construct an aircraft parking apron north of the parallel taxiway
  - Extend utilities to service the UAS development area
  - Fully serviced sites to accommodate UAS hangars and commercial buildings
  - Internal access roads and vehicle parking within UAS Research and Operations Park;
- Extend vehicle access road from NW Stage Gulch Road and Daniel Road to UAS development area.
- Construct new UAS Air Traffic Control Tower

Figure 7-10 UAS Development Alternative

Terminal Building Alternatives

The terminal building facilities at Eastern Oregon Regional Airport are located south of Runway 7/25 and west of Runway 11/29. The terminal building consists of airline concessions, rental car concessions, passenger waiting room, restaurant, and airport administration offices. The primary facilities in the terminal building are located on the first and second floor, which has a combined 23,147 square feet. The terminal also has a basement level with 1,058 square feet, third floor with 400 square feet, and fourth floor with 950 square feet. The third and fourth floors include the air traffic control tower.

A terminal building assessment was conducted as part of the master planning process, in which an architect[3] performed a site visit and evaluated the overall condition of the terminal building and created alternatives to best address changes needed to facilitate forecast demand. The primary changes reflect the need to facilitate the addition of Transportation Security Administration (TSA) screening, screened passenger waiting space, TSA office space, and baggage screening. Other changes include the option of having a Fixed Base Operator (FBO) operate inside the terminal. This would require a lobby with passenger waiting space, office space, and passenger access between the FBO and the apron area.

Terminal Building Alternative A

Terminal Building Alternative A (see **Figure 7-11**) leaves the existing restaurant and bar at the eastern portion of the building and upgrades the western terminal portion of the building to meet future needs.

On the eastern side of the building, the kitchen, restaurant, and bar will remain as is. The restrooms on this side of the building will be renovated to serve the terminal, restaurant, and bar.

RENOVATED SPACE ALLOTMENTS

Women's Restroom – 240 sf
Men's Restroom – 350 sf

On the western side of the building, a properly sized TSA screening area will divide the current waiting room from exiting on the eastern side and a secure gate hold room on the western side. The ticketing counter will remain in place and TSA screening and an airline office will fill the two spaces behind the counter. Circulation has been refined to access a TSA office space, a car rental office and provide three additional offices spaces. The baggage claim will be renovated but remain in its' current location. A car rental counter has been placed near the exiting circulation. Multiple locations have been reserved in the terminal to house artifacts from the local area or the air museum.

[3] Madden, Phil. Architect. Mead and Hunt.

RENOVATED SPACE ALLOTMENTS

Terminal Circulation – 2680 sf

Gate/Waiting Area – 495 sf

TSA Screening – 620 as

Exiting – 270 sf

Airline Office – 340 sf

Bag Screening – 375 sf

TSA Office – 435 sf

Car Rental Office – 155 sf

Office – 190 sf

Office – 125 sf

Office – 320 sf

Baggage Claim – 560 sf

Terminal Building Alternative B

Terminal Building Alternative B (see **Figure 7-12**) maintains the existing restaurant and bar at the eastern portion of the building and upgrades the western terminal portion of the building to meet future needs.

On the eastern side of the building, the kitchen, restaurant, and bar will remain as is. The restrooms on this side of the building will be renovated and serve the terminal, restaurant, and bar.

RENOVATED SPACE ALLOTMENTS

Women's Restroom – 240 sf

Men's Restroom – 350 sf

On the western side of the building, a properly sized TSA screening area will divide the current waiting room from exiting on the eastern side and a secure gate hold room on the western side. The ticketing counter will remain in place and TSA screening and an airline office will fill the two spaces behind the counter. Circulation has been refined to access a TSA office space, car rental office, and provide three additional offices spaces. The baggage claim will be renovated but remain in its' current location. A car rental counter has been placed near the exiting circulation. Multiple locations have been reserved in the terminal to house artifacts from the local area or the air museum.

RENOVATED SPACE ALLOTMENTS

Terminal Circulation – 2680 sf

Gate/Waiting Area – 495 sf

TSA Screening – 620 as

Exiting – 270 sf

Airline Office – 340 sf

Bag Screening – 375 sf

TSA Office – 435 sf

Car Rental Office – 155 sf

Office – 190 sf

Office – 125 sf

Office – 320 sf

Baggage Claim – 560 sf

Terminal Building Alternative C

Terminal Building Alternative C (see **Figure 7-13**) renovates the eastern portion of the building to include revenue generating office space and upgrade the western terminal portion of the building to meet future needs.

On the eastern side of the building, the kitchen, restaurant, and bar are replaced with six offices and a central lobby area serving these offices. The restrooms on this side of the building will be renovated and serve both the terminal and offices.

RENOVATED SPACE ALLOTMENTS

Office – 300 sf

Office – 380 sf

Office – 380 sf

Office – 540 sf

Office – 350 sf

Office – 300 sf

Lobby – 490 sf

Women's Restroom – 240 sf

Men's Restroom – 350 sf

On the western side of the building, a properly sized TSA screening area will divide the current waiting room from exiting on the eastern side and a secure gate hold room on the western side. The ticketing counter will remain in place and TSA screening and an airline office will fill the two spaces behind the counter. An FBO suite has been designed within this portion of the terminal. It will include an office, a pilot planning room and a waiting area and lobby. The baggage claim will be renovated but remain in its' current location. A car rental counter has been placed near the exiting circulation. Multiple locations have been reserved in the terminal to house artifacts from the local area or the air museum.

RENOVATED SPACE ALLOTMENTS

Terminal Circulation – 2680 sf

Gate/Waiting Area – 495 sf

TSA Screening – 620 as

Exiting – 270 sf

Airline Office – 340 sf

Bag Screening – 375 sf

FBO Office – 220 sf

Pilot Planning – 265 sf

FBO Waiting Area – 685 sf

Car Rental Office – 250 sf

Baggage Claim – 560 sf

Figure 7-11 Terminal Building Alternative A

Figure 7-12 Terminal Building Alternative B

Figure 7-13 Terminal Building Alternative C

Preferred Airport Development Alternatives

Note: The recommended preferred alternative elements described in this section were presented in the original December 2016 draft final airport master plan report. The FAA review and comment for several master plan elements, including the alternatives evaluation, was conducted after the nearly two-year local planning process was completed. As a result, several changes to the preferred alternative were made based on the "post-planning" coordination with FAA. These changes are reflected on the final Airport Layout Plan and Terminal Area Plan presented in Chapter 8.

The preferred airside, landside, and terminal building development options were selected and refined, based on the review of preliminary alternatives by city staff and the Planning Advisory Committee.

The preferred Airside Development Alternative is a modified version of preliminary Airside Development Alternative B, and is depicted in **Figure 7-14**. The preferred airside alternative displaces the Runway 29 threshold 913 feet to the northwest and incorporates the Taxiway Option B. The preferred airside alternative differs from the original alternative in that the original alternative relocated rather than displaced the threshold 913 feet. Displacing the threshold retains use of the pavement beyond the displacement for departures whereas relocating the threshold would preclude use of any pavement beyond the relocated threshold (FAA typically requires abandonment/removal of the pavement beyond a relocated threshold). The preferred alternative also incorporates a new turf runway south of and parallel to Runway 11/29. Taxiway Option B outlined previously has been incorporated with modifications to include the addition of a new, large aircraft hold apron.

The preferred Landside Development Alternative (West Hangar Area) was created by modifying Landside Alternative A and is depicted in **Figure 7-15**. Whereas Landside Alternative A incorporated three new T-hangars oriented in an east-west alignment, the preferred alternative incorporates four new T-hangars oriented in two north-south aligned rows. The preferred alternative also shifts the new box hangars further south and closer to NW Avenue A. Alternative A has also been modified to include additional box hangar development southwest of the existing general aviation apron.

The preferred Main Apron Alternative is depicted in **Figure 7-16. The Preferred Alternative** retains the landside development shown in Main Apron Alternative 2 with modifications to the main apron aircraft parking layout. The aircraft parking layout has been modified to facilitate access to and from the terminal apron to Runway 11/29.

The preferred UAS Development Alternative is a modified version of the preliminary option and is depicted in **Figure 7-17.** The Preferred UAS Alternative includes development of a 2,800 foot long by 60-foot wide UAS runway with a 25-foot wide parallel taxiway. A variety of landside development sites would generally be located north and east of the proposed UAS runway along either side of Taxiway G. Taxiway G will be retained as an ADG III taxiway to accommodate transient military or general aviation aircraft that may transit to and from the UAS landside development area.

PREFERRED AIRSIDE DEVELOPMENT ALTERNATIVE

- Reconfigure Runway 11/29 (5,581 x 75 feet):
    - Displace the Runway 29 end 913 feet to the northwest;
    - Narrow Runway 11/29 from 100 to 75 feet; replace runway lighting;
    - Re-mark existing runway pavement south of the displaced Runway 29 end;
- Reconfigure taxiway access to Runway 29;
- Remove existing pavement (Taxiway E, the eastern section of Taxiway D, and the south section of Taxiway G);
- Extend parallel Taxiway L (northwest section);
- Construct new Runway 7/25 exit taxiway (mid-runway) and middle section of Taxiway L for Runway 7/25;
- Construct new access taxiway between the main apron/Taxiway D and Taxiway G and the new Runway 7/25 exit taxiway;
- Construct new access taxiway between Runway 7 and Runway 11 threshold (independent of Runway 11/29 parallel taxiway);
- Remove section of Taxiway B (connection between Runway 7/25 & 11/29 intersection and Taxiway A);
- Construct new UAS runway, north of Runway 7-25 and west of Taxiway G;
- Mark new UAS runway with basic runway marking; and
- Construct a new turf runway between Runway 7-25 and the extended Taxiway F. (It would be helpful if the Preferred Alternatives drawings had circled numbers to identify the various projects.)

PREFERRED LANDSIDE DEVELOPMENT ALTERNATIVE

- Access road improvements (connecting NW 56th Street to north hangar sites);
- Develop North Hangar Row - conventional hangar sites (located north of Taxiway/Taxilane D, east and west of Life Flight hangar);
- Construct west extension of Taxiway D (ADG II taxilane);
- Construct new ADG I taxilanes serving T-hangars;
- Develop aircraft Storage Hangars – sites for five 10/12-unit T-hangars (52 units total +/-), small conventional hangars (23 sites depicted), and commercial hangars (6 sites depicted);
- Develop additional vehicle parking;
- Install new airport security fencing and gates; and
- Establish development reserve area.

PREFERRED MAIN APRON ALTERNATIVE

- Maintain the existing buildings on the main apron;
- Reconfigure/designate ADG II taxilanes for aircraft parking areas, EAA hangar, and terminal;
- Develop transient drive through parking positions (5) for business aircraft near the terminal building;
- Reconfigure two of the existing west tiedown rows for multi-use double-sided tiedowns;
- Develop air cargo drive through parking position sized for ATR-72 or smaller cargo aircraft with loading area;
- Establish designated large aircraft parking areas for transient military and civilian aircraft such as C130, C17 or CH-47;
- Relocate and expand the existing above-ground aviation fuel storage and dispensing area (Jet-A and AVGAS);
- Reserve a secondary fuel storage and dispensing area north of the EAA building, to serve a potential FBO in the terminal building;
- Reserve a cargo building and operations area (south of apron & fence line);
- Develop vehicle parking and circulation improvements (south of apron & fence line); and
- Construct a new snow removal equipment (SRE) building across from existing SRE building.

PREFERRED UAS DEVELOPMENT ALTERNATIVE

- Construct a 2,800-foot by 60 foot wide UAS designated runway (ADG-I standards) 700 feet north of Runway 7/25;
- Construct a 25 foot wide north parallel taxiway for the UAS runway;
- Maintain ADG-III standards for Taxiway G to facilitate military and GA operations to/from UAS landside development area;
- Develop landside facilities north of the UAS runway and parallel taxiway:
    - Develop internal access roads and vehicle parking within UAS Research and Operations Park;
    - Extend utilities to service the UAS development area;
    - Construct an aircraft parking apron north of the parallel taxiway;
    - Develop serviced sites to accommodate UAS hangars and commercial buildings;
- Develop access road from NW Stage Gulch Road or Daniel Road to UAS development area.

PREFERRED TERMINAL BUILDING LAYOUT ALTERNATIVE

The city has decided not to choose a preferred Terminal Building Alternative at this time. The three options were designed to accommodate a variety of new tenants and facility needs that will be determined at a later date.

All three options reconfigure the main terminal area to support the addition of TSA and a commercial airline operator. The east side of the terminals first floor could be modified to support a smaller restaurant or coffee shop with a museum, gallery, or office space. The west side of the terminals first floor could be modified to support the addition of an FBO.

The Terminal Building Alternatives are depicted in **Figures 7-11**, **7-12**, and **7-13**.

Figure 7-14

Figure 7-15

Figure 7-16

Figure 7-17

Chapter 8 – Airport Layout Drawings

Chapter 8 – Airport Layout Drawing

Introduction

The options that were considered for the long-term development of Eastern Oregon Regional Airport resulted in the selection of a preferred alternative. The preferred alternative has been incorporated into the airport layout plan drawings, which are depicted in this chapter. The set of airport plans, which is referred to in aggregate as the "Airport Layout Plan" (ALP) has been prepared in accordance with FAA guidelines. The drawings illustrate existing conditions, recommended changes in airfield facilities, property ownership, land use, and obstruction removal. The ALP set is presented at the end of this chapter:

- Sheet 1 – Cover Sheet
- Sheet 2 – Airport Data Sheet
- Sheet 3 – Airport Layout Plan
- Sheet 4 – On-Airport Individual Area Plans (Terminal Area)
- Sheet 5 – On Airport Individual Area Plans (UAS Development Area)
- Sheet 6 – Airport Airspace Plan (FAR Part 77)
- Sheet 7 – Airport Airspace Plan (FAR Part 77)
- Sheet 8 – Runway 7 Approach Surface Plan and Profile
- Sheet 9 – Runway 25 Approach Surface Plan and Profile
- Sheet 10 – Runway 11/29 Approach Surface Plan and Profile
- Sheet 11 – Runway Protection Zone/Inner Approach Plan and Profile (Runway 7/25)
- Sheet 12 – Runway Protection Zone/Inner Approach Plan and Profile (Runway 11/29)

- Sheet 13 – Runway Protection Zone/Inner Approach Plan and Profile (UAS Runway) and Approach Surface Plan and Profile
- Sheet 14 – Airport Land Use Plan
- Sheet 15 – Exhibit "A" Airport Property Plan

The airport layout plan drawings provide detailed information for existing and future facilities. The future improvements depicted in the drawing set are consistent with the airport master plan's updated twenty-year capital improvement program contained in Chapter 10. The ALP drawing set was submitted along with the draft final airport master plan report to Federal Aviation Administration (FAA) for review in late 2016.

The ALP drawings were reviewed by the FAA Airports District Office (ADO) with additional review coordinated with other FAA offices (Flight Procedures, Flight Standards, etc.). The FAA provided multiple rounds of comments and revision requests on the ALP drawing set in a lengthy review period that extended from January 2017 to September 2018. The areas of particular focus included defining and noting FAA funding ineligibility for Runway 11/29, addressing the existing displaced threshold on Runway 29 and the future configuration of Runway 11/29, and depicting the FAA-recognized planning criteria for Runway 7/25 and 11/29 in light of the city's long-established interest in preserving the airfield's historical design capabilities wherever possible. Following completion of the final round of FAA revisions, the final ALP drawing set was signed by the City of Pendleton and the FAA Seattle Airports District Office (ADO) in October 2018.

As individual projects are completed, minor "as-built" updates to the ALP drawing may be completed (with FAA coordination) without updating the airport master plan. A complete update of the full ALP drawing set will be conducted as part of the next master plan update.

The airport layout plan drawings are prepared using AutoCAD® computer-aided drafting software, which allows for easier updating and revision. The drawing files may also be imported into local geographic information systems (GIS) to support land use planning, airport overlay zone mapping, etc.

A brief summary of the individual drawings is provided below:

Airport Data Sheet Drawing

The Airport Data Sheet drawing contains detailed runway and taxiway dimensions, FAA dimensional standards, wind roses, and other data that is reflected on the sheets in the drawing set.

Airport Layout Plan Drawing

The Airport Layout Plan (ALP) drawing graphically depicts existing and future airfield facilities. Future facilities are color-coded (red) to distinguish them from existing facilities. Future facilities are represented in the airport master plan's twenty-year capital improvement program (CIP) as individual projects or project groupings. The future Runway 11/29 depicts a relocation of the Runway 29 threshold and a reduced runway length of 4,668 feet, from the current 5,582 feet. Taxiway reconfiguration, abandonment of existing runway/taxiway pavement, and construction of several new taxiway sections is depicted on the ALP.

Long-term development reserves depicted on the ALP are color coded (green). These items are intended to serve as placeholders or are provided for reference only. Demand for facility development reserves is not anticipated to occur in the current twenty-year planning period and therefore, the corresponding projects are not included in the Master Plan CIP. A change of events that could move a development reserve into an actual project would require updated planning and coordination with FAA.

On-Airport Individual Area Plans Drawing

The On-Airport Individual Area Plans drawings (Terminal Area Plan and UAS Development Area Plan) provide additional detail for existing and new facilities in the landside areas. The Terminal Area Plan focuses on the terminal and general aviation aprons, the southwest hangar area, and the National Guard area. The UAS Development Area Plan focuses on the commercial and industrial development north of Runway 7/25.

FAR Part 77 Airspace Drawings

The FAR Part 77 Airspace drawings depict the protected airspace defined for Runway 7/25, 11/29, and the future UAS Runway in Federal Air Regulation (FAR) Part 77, *Objects Affecting Navigable Airspace*. The airspace plan drawings depict the five "imaginary surfaces" defined in FAR Part 77.25 including the primary, transitional, approach, horizontal, and conical surfaces, previously described in the Facility Requirements Chapter. Part 77 surfaces should be free of built or terrain obstructions to the great extent possible. Objects that penetrate FAR Part 77 surfaces may require action to mark or remove depending on their severity, location, and the feasibility of the action. The drawing includes a table of obstructions with recommended dispositions.

The physical characteristics of the Part 77 surfaces are defined the size of aircraft using the runway and the approach capabilities of the runway.

- **Runway 7/25 Approach Surface:** Extends 10,000 feet from the end of the runway primary surface. The Runway 25 approach surface has a slope of 50:1 and Runway 7 approach surface has a 34:1 slope, which represents the horizontal distance required for each increment of vertical rise.

- **Runway 11/29 Approach Surface:** Extends 10,000 feet from the end of the runway primary surface. Both Runway 11 and 29 have an approach surface slope of 34:1, which represents the horizontal distance required for each increment of vertical rise.

- **UAS Runway Approach Surface:** Extends 5,000 feet from the end of the runway primary surface. Both runway ends have an approach surface slope of 20:1, which represents the horizontal distance required for each increment of vertical rise.

- **Runway 7/25 Primary Surface:** Based on the precision approach standards for other than utility runway, the primary surface is 1,000 feet wide extending 200 feet beyond each end of the runway. The primary surface is a flat plane of airspace centered on the runway with the same elevation as the nearest point on the runway centerline.

- **Runway 11/29 Primary Surface:** Based on the non-precision approach standards for other than utility runway, the primary surface is 500 feet wide extending 200 feet beyond each end of the runway. The primary surface is a flat plane of airspace centered on the runway with the same elevation as the nearest point on the runway centerline.

- **UAS Runway Primary Surface:** Based on the visual approach standards for a utility runway, the primary surface is 250 feet wide extending 200 feet beyond each end of the runway. The primary surface is a flat plane of airspace centered on the runway with the same elevation as the nearest point on the runway centerline.

- **Transitional Surface:** The runway transitional surfaces extend outward and upward from the outer edges of the primary surface. The transitional surfaces have a slope of 7:1 and extend to an elevation 150 feet above airfield elevation and connect to the runway horizontal surface.

- **Horizontal Surface:** The horizontal surface is drawn from 5,000-foot radii that extend from both ends of the primary surface to form an oval. The horizontal surface is a flat plane of airspace with an elevation 150 feet above airport elevation.

- **Conical Surface:** The conical surface extends from the outer edge of the horizontal surface at a slope of 20:1 for 4,000 feet.

Runway Inner Approach Surface / RPZ Drawing

The Inner Approach Surface and Runway Protection Zone (RPZ) drawing depict detailed plan views of these areas and a profile view of the approach surface and threshold siting surface (when used). The obstruction data for items depicted on the drawing use the same numbering from the overall Part 77 Airspace Plan and Approach Surface and Profile drawings.

Runway Approach Surface Plan and Profile Drawings

The Approach Surface drawings depict plan and profile views of the runway approach surfaces depicted in the FAR Part 77 airspace plan. The drawings provide additional detail in identify obstructions, terrain and other physical features within the approach surfaces. The drawings include obstruction data tables for items depicted on the drawing, using the same numbering identifiers from the overall Part 77 Airspace Plan.

Airport Land Use Plans

The Airport Land Use Plan drawings depict existing comprehensive plan and zoning designations for the airport and surrounding areas. Eastern Oregon Regional Airport is located outside the Pendleton city limits, within Umatilla County.

The Airport Land Use Plan drawing also includes the existing and future traffic patterns. The existing traffic pattern is based on the current runway configuration. Once the future UAS Runway is constructed, Runway 7/25 and 11/29 will have traffic patterns that keep fixed-wing and helicopter traffic to the south, away from UAS traffic that will be north of the UAS Runway.

Exhibit "A" – Airport Property Plan

The Airport Property Plan drawing provides depicts all property owned by the City included in the airport. The drawing notes the form of ownership or control (fee simple, avigation easement, etc.) and the date of acquisition per FAA guidelines.

Insert ALP Drawings

Chapter 9 – Airport Compatible Land Use

Chapter 9 – Compatible Land Use Planning in the Vicinity of the Airport

Introduction

This chapter describes land use associated with the Eastern Oregon Regional Airport and its surroundings and describes federal and state statutes with guidance for land use planning and zoning. The intent of this chapter is to identify existing and future land use and zoning incompatibilities and identify lands currently owned by the city that could be sold thereby providing an additional source of revenue for on-going airport development.

Government Roles in Airport Land Use

Federal

The Federal Aviation Administration (FAA) does not have authority to regulate off airport land use, including the construction of built items. Land use regulation is a local responsibility and FAA has a technical advisory role based on its interest in protecting the airspace associated with an airport as part of the national airspace system. The FAA does have a role in regulating on-airport land use through approval of the Airport Layout Plan (ALP) and airport sponsor compliance with the FAA Airport Improvement Program (AIP) grant assurances. These assurances include measures to maintain airport land use compatibility and protect the aeronautical function of an airport by restricting the location of non-aviation land uses.

Under **14 Code of Federal Regulations (CFR), Part 77,** the FAA has the authority to review proposed construction through its **Form 7460-1** Notice of Proposed Construction or Alteration process. The FAA review addresses compatibility both on and off airport based on the potential for creating a "hazard to air navigation" associated with obstructions/penetrations in defined airspace. FAA airspace reviews include **FAR Part 77** surfaces; Terminal Instrument Procedures (TERPS) surfaces, visual runway traffic patterns, and visual navigation aid (e.g., VASI, PAPI, etc.) protected airspace. When a proposed structure penetrates navigable airspace, the FAA will issue a letter objecting to the proposed action (determination of presumed hazard to air navigation) for the consideration of local authorities. When proposed actions do not present a hazard to air navigation, a "no objection" finding is issued. It is important to note that this analysis is based on an obstruction evaluation and is not intended to address land use compatibility in terms of noise exposure or proximity to an airport or runway.

The FAA recommends that local jurisdictions include the following language in their development codes: "Nothing in this chapter shall diminish the responsibility of project proponents to submit a Notice of Proposed Construction or Alteration to the Federal Aviation Administration if required in accordance with **FAR Part 77**, Objects Affecting Navigable Airspace."

FAR Part 150, Airport Noise Compatibility Planning provides guidance for land use compatibility around airports. The 1990 Airport Noise and Capacity Act (ANCA), defines the federal policy on the regulation of airport noise (operating curfews, aircraft restrictions, etc.), with the intent of standardizing noise controls throughout the national system.

State

The State of Oregon has created statutes that provide standards and guidelines for local governments to use in order to create zoning ordinances to encourage compatible land uses around airports. The State of Oregon's laws and statutes are provided by the Airport Planning Rule, which is located in **Oregon Administrative Rules (OAR),** contained in **Chapter 660, Department of Land Conservation and Development; Division 12, Transportation Planning** and **Division 13, Airport Planning** to address airport protection and function. Local governments shall follow State rules as described in **OAR 660** for planning and managing public-use airports. Division 12 states that local governments shall participate and develop a Transportation System Plan with "measures to protect public use airports by controlling land uses within airport noise corridors and imaginary surfaces, and by limiting physical hazards to air navigation."

Division 13, Airport Planning states, "the policy of the State of Oregon is to encourage and support the continued operation and vitality of Oregon's airports." It includes "rules that are intended to promote a convenient and economic system of airports in the State and for land use planning to reduce risks to aircraft operations and nearby land uses." A summary of these requirements is provided below:

- **660-013-0030 Preparation and Coordination of Aviation Plans** states "A city or county with planning authority for one or more airports, or areas within safety zones or compatibility zones described in this division, shall adopt comprehensive plan and land use regulations for airports consistent with the requirements of this division and ORS 836.600 through 836.630."

- **660-013-0040 Aviation Facility Planning Requirements** provides a list of planning requirements including a map showing the location of the airport boundary, a map or description of existing and planned facilities, a projection of future aeronautical needs, etc.

- **660-013-0070 Local Government Safety Zones for Imaginary Surfaces** specifies that "local governments shall adopt an Airport Safety Overlay Zone to promote aviation safety by prohibiting structures, trees and other objects of natural growth from penetrating airport imaginary surfaces."

- **660-13-0080 Local Government Land Use Compatibility Requirements for Public Use Airports** provides a list of requirements including prohibiting new residential development and public assembly uses within the Runway Protection Zone (RPZ) and limits establishment of uses within the noise impact boundary.

- **660-013-0100 Airport Uses at Non-Towered Airports** requires local governments to adopt land use regulations that authorize a range of defined airport uses within the airport boundary of non-towered airports.

- **660-013-0140 Safe Harbors** defines "safe harbor" requirements that may be used by local governments including existing comprehensive plans, land use regulations, Airport Master Plans, and Airport Layout Plans.

- **660-013-155 Planning Requirements for Small Airports** specifies that airports are to be subject to the planning and zoning requirements within ORS 836.

Division 13 implements **Oregon Revised Statutes (ORS) 836.600** through **836.630**, which promotes land use planning to reduce unnecessary risk to aircraft operations. Several key statutes important in land use planning are summarized below:

- **836.608 Airport operation as matter of state concern (local planning documents to recognize airport location, limitations on use, and expansion of facility)** - requires local governments to recognize airport locations within planning documents. It also prohibits limitations on use and includes a process by which airports can add new land uses on their property.

- **836.610 Local government land use plans and regulations to accommodate airport zones and uses including funding and rules** - requires local governments to amend their land use regulations and comprehensive plans in accordance to 836.616 and 836.619.

- **836.616 Rules for airport uses and activities** - identifies types of permitted land uses and activities on airport property and requires local government to meet standards for safe land uses near airports.

- **836.623 Local compatibility and safety requirements more stringent than state requirements (criteria, water impoundments, report to federal agency, and application to certain activities)** - allows local governments to adopt land use compatibility and safety requirements that are more stringent than the minimum required by Land Conservation and Development Commission rules. It provides rules which limit the size of water impoundments near airports in an effort to reduce wildlife attractants.

Local

Establishing compatible land uses around airports is the responsibility of local governing agencies with planning and zoning authority. The FAA and airport management may provide recommendations on land use issues while discouraging incompatible land uses around airports. The City of Pendleton and Umatilla County have land use authority for the Eastern Oregon Regional Airport and its immediate surroundings. The Airport is located within the City of Pendleton approximately three-mile northwest of downtown Pendleton and within the city's Urban Growth Boundary. Umatilla County and the City of Pendleton have established airport overlay zoning to ensure their land uses are compatible with the Airport for long-term growth.

Comprehensive Plan

City of Pendleton

The City of Pendleton, as noted above, has jurisdiction over Airport land use and zoning. The City's comprehensive plan designation for the land underlying the Eastern Oregon Regional Airport is a combination of Airport Industrial, Light Industrial, and Industrial Reserve[1]. The City's plan acknowledges that improvements to the airport would increase its importance as a valuable economic resource to the City's transportation system. **Figure 9-1** is a map depicting the existing City of Pendleton and Umatilla County Land Use and Zoning in the immediate airport vicinity. **Figure 9-2** is an enlarged view of the airport landside depicting the city Land Use and Zoning in this area.

[1] City of Pendleton Unified Development Code (3845) 2014

Umatilla County

The County's Comprehensive Plan, Chapter 15 Transportation, provides county Findings and Policies for the county's transportation system, including those that promote and protect aviation in the region2. Findings and Policies that apply specifically to the airport include the following:

FINDING	POLICY
Finding 6 - An important airport industrial complex lies in the northeast corner of the City of Pendleton's Urban Growth Boundary where topography and location require a well-planned .transportation system to insure its full and efficient development.	Policy 6 - Consider designating an arterial road from Barnhart Interchange on 1-84 to the west side of this industrial park, to provide a level and more energy efficient route for business and manufacture-related traffic.
Finding 16 - Airports are experiencing increases in traffic and are undergoing improvements in accordance with their Airport Master Plans.	Policy 16 - Continue to cooperate in protecting the existing and planned elements of the airports from incompatible neighboring land uses through the use of airport hazard zoning and joint management agreements with each city.
Finding 27 - Measures are needed to protect airports by controlling land uses within airport noise corridors and imaginary surfaces, and by limiting physical hazards to air navigation. C - Publicly owned publicly used airports are already under protective overlay zoning specific to the airport.	Policy 27 - Umatilla County shall adopt and implement an airport zone, supporting Airport Safety Overlay Zones, or similar protective measures for airports (as defined in ORS 836.610) in Umatilla County.

[2] Umatilla County Comprehensive Plan, Chapter 15 Transportation (19)

Figure 9-1 City of Pendleton and Umatilla County Land Use and Zoning (Airport and Vicinity)

Figure 9-2 City of Pendleton and Umatilla County Land Use and Zoning (Landside Area)

Airport Zoning

City of Pendleton

The City of Pendleton has zoned the Eastern Oregon Regional Airport with three designations, "Airport Activities" (AA), Light Industrial (M1), and Exclusive Farm Use (EFU-CO). As defined in the County Zoning Ordinance[3], the purpose of the Airport Activities Zone is "*To protect the lands lying adjacent to the airport runway and terminal areas from incompatible development, while providing lands for airport-related and agricultural uses.*"

Permitted uses include:

A. *Aviation Industries*
B. *Aviation Operational Services*
C. *Farming and Forestry Activities*
D. *Freight Services*
E. *Passenger Transportation Services*
F. *Public Services*

Conditional Uses "*similar to those listed as outright that, in the opinion of the Planning Commission, will have no greater detrimental effects on adjoining uses*" may be permitted.

The Light Industrial Zone (M1) is intended to "*to reserve industrial sites near the airport for specific employment uses identified in the Pendleton Economic Opportunities Analysis (EOA)*". The Light Industrial Zone provides for a mix of *Permitted* and *Conditional* Uses. Permitted Uses include:

A. *Air Transportation Facilities;*
B. *Automobile and vehicle dealers, repairs, services and service stations;*
C. *Building Materials, retail;*
D. *General Business Services;*
E. *Communication Facilities;*
F. *General building and trade contractors;*
G. *General Light Industrial;*
H. *General Repair Services;*
I. *Governmental, public, or semi-public uses or structures;*
J. *Transportation Facilities and Services;*
K. *Wholesaling, durable and nondurable goods;*
L. *Solid Waste Transfer Stations, if the solid waste transfer station:*
   1. *Is not within 1,000 feet of an existing residential structure or residential zone, or*
   2. *The location of the transfer station has been approved by a vote of the people.*

[3] Ordinance No. 3845 Exhibit A, City of Pendleton Unified Development Code,– December 3, 2014, pg. 24.

M. *Within the Central Mixed Use Plan Designation, expansion of existing, lawfully established residential and commercial uses on the same or adjacent property.*

Conditional Uses, except as modified in specific subdistricts include:

A. *Animal Clinic, Kennel, or Hospital;*
B. *Commercial Amusement and Recreation;*
C. *Eating and Drinking Establishments;*
D. *Fuel and Ice Dealers;*
E. *Hotels, motels, other lodging;*
F. *Junk yard, wrecking yard;*
G. *Industrial and agricultural chemicals, paint;*
H. *Ordnance;*
I. *Petroleum pipeline facilities;*
J. *Sanitary landfills, solid waste disposal or treatment facilities;*
K. *Transportation Equipment (Air, land, water and space vehicles, equipment and accessories);*
L. *Utilities;*
M. *Landscape and Horticultural Services;*
N. *Social Services;*
O. *Dwelling, Caretaker or Manager Only.*

The purposes of the Exclusive Farm Use Zone are:

- *To preserve and maintain agricultural lands for farm use, including range and grazing uses, consistent with existing and future needs for agricultural products, and open spaces;*
- *To conserve and protect scenic resources;*
- *To maintain and improve the quality of air, water, and land resources of the City;*
- *To establish criteria and standards for farm uses and related and supportive uses which are deemed appropriate, and*
- *To provide the automatic farm use valuation for farms which qualify under the provisions of Oregon law.*

Permitted uses include:

A. *Production of crops and livestock, excepting feedlots and hog farms. For the purpose of this Section, farm use includes customary accessory uses such as but not limited to: corrals, pens, barns, sheds, maintenance buildings, farm owned or personal use grain bins or elevators and chemical storage)*
B. *Agricultural services*
C. *The production of alcohol fuels from agricultural products for private use on farm premises*
D. *Sale of agricultural produce grown on the farm premises*
E. *Utility facilities necessary for public service except commercial facilities for the purpose of generating power for use by sale*

The following uses and their accessory uses are permitted when authorized:

A. *Operations conducted for the exploration, mining and processing of geothermal resources, aggregate and other mineral resources or other subsurface resources*
B. *Farmstead divisions from original farm units when the following can be met:*
C. *The person making the request has resided on and owned the property for at least the preceding ten (10) consecutive years;*
D. *The remainder of the parcel shall not be partitioned for a similar purpose;*
E. *The purpose of the homesite partition shall be for retirement thereon;*
F. *The remainder of the property shall continue in farm use;*
G. *The original parcel is a minimum of twenty (20) acres;*
H. *The first right of refusal for repurchase of the farmstead parcel is given to the parent parcel;*
I. *The farmstead parcel shall be a maximum of five (5) acres which includes the original farm dwelling and necessary accessory buildings to support the residential use only. The farmstead parcel shall be only as large as necessary to accommodate the residential use, and shall not include tillable land from the farmstead.*
J. *Commercial utility facilities for the purpose of generating power for public use by sale*
K. *Cattle feed lots, stockyards, hog farms*
L. *Home occupations carried on by residents as an accessory use within their dwelling or other buildings customarily provided in conjunction with farm use (see Article 11 of this Ordinance for home occupation criteria)*
M. *A dwelling (mobile home or single family dwelling) and other buildings customarily provided in conjunction with farm use, on lots that meet the size requirement of this Article, in accordance with Oregon Law. (This includes the principal farm dwelling for the owner or operator and farm employee dwellings, bunkhouses and their accessory uses [e.g. garages and storage sheds], but does not include barns, sheds, personal use grain elevators, silos, corrals, etc.).*
N. *Other buildings and uses not listed in above that appear in Oregon Law as alternate uses permissible in an exclusive farm use zone.*

Airport Vicinity Zoning

Umatilla County

Umatilla County has zoning jurisdiction over the land immediately surrounding the Airport on the west, north, and east sides. The majority of these lands are zoned Exclusive Farm Use-County (EFU-CO). A portion to the west, generally along Airport Road and portions to the north on either side of Stage Gulch Road are designated Industrial Reserve Area Overlay:[4]

- Exclusive Farm Use (EFU-CO)-"*The EFU-CO Exclusive Farm Zone is designed to maintain the agricultural economy of the county by reserving farmland for exclusive agricultural use.*"

[4] Umatilla County Zoning and Land Development Ordinance, *Chapter IV* (1985).

- Light Industrial (M1)-"*The M-1 Light Industrial Zone is designed to provide areas for industrial uses which do not create nuisance problems for nearby homes, business or farm areas. It is appropriate for areas near major transportation facilities which are generally suitable for industry but because of proximity to home, business or farm areas, nuisance industry is inappropriate*".

See **Figure 9-1 and Figure 9-2** for the city and county zoning map.

Airport Overlay Zones

City of Pendleton

The City of Pendleton has not established an Airport Overlay Zone, but rather has implemented an Airport Hazard Subdistrict within the Airport Activities Zone. The Airport Hazard Subdistrict has been adopted as authorized by the authority granted by Oregon law. The general intent of the Airport Hazard Subdistrict is to recognize the potential hazards associated with airport activity both to people and property using and in the vicinity of the airport and to provide "*certain zones which include all of the land lying within the approach zones, transitional zones, horizontal zones, and conical zones as they apply to the Airport. Such zones are shown on the Approach and Clear Zone Plan adopted as part of the city's Airport Master Plan*". *An area located in more than one (1) of the following zones is considered to be only in the zone with the more restrictive height limitation.* The established zones and their definitions are:

A. *Visual Runway Approach Zone. The inner edge of this approach zone coincides with the width of the primary surface and is 250 feet wide. The approach zone expands outward uniformly to a width of 1,250 feet at a horizontal distance of 5,000 feet from the primary surface, its centerline being the continuation of the centerline of the runway.;*
B. *Runway Larger Than Utility with a Visibility Minimum Greater Than: Mile Non-precision Instrument Approach Zone. The inner edge of this approach zone coincides with the width of the primary surface and is 500 feet wide. The approach zone expands outward uniformly to a width of 3,500 feet at a horizontal distance of 10,000 feet from the primary surface. Its centerline is the continuation of the centerline of the runway.;*
C. *Precision Instrument Runway Approach Zone. The inner edge of this approach zone coincides with the width of the primary surface and is 1,000 feet wide. The approach zone expands uniformly outward to a width of 16,000 feet at a horizontal distance of 50,000 feet from the primary surface. Its centerline is the continuation of the centerline of the runway.;*
D. *Transitional Zones. These zones are hereby established as the area beneath the transitional surfaces. These surfaces extend outward and upward at 90 degree angles to the runway centerline and the runaway centerline extended at a slope of seven (7') feet horizontally for each foot vertically from the sides of the primary and approach surfaces to where they intersect the horizontal and conical surfaces.;*
E. *Horizontal Zone. The horizontal zone is hereby established by swinging arcs of 5,000 feet radii from the center of each end of the primary surface of each runway, and connecting the adjacent arcs by drawing lines tangent to those arcs. The horizontal zone does not include the approach and transitional zones.;*

F. *Conical Zone. The conical zone is hereby established as the area that commences at the periphery of the horizontal zone and extends outward therefrom a horizontal distance of 4,000 feet. The conical zone does not include the visual approach zones and the transitional zones.*

In addition, the City has established **Airport Zone Height Limitations**. The zone height limitations dictate that "*No structure or vegetation shall be erected, altered, allowed to grow, or be maintained in any zone created by this Ordinance to a height in excess of the applicable height limitations herein established for such zone*".

The Airport Zone Height Limitations are as follows:

A. *Visual Runway Approach Zone. Slopes upward twenty (20') feet horizontally for each foot vertically beginning at the end of and at the same elevation as the primary surface and extending to a horizontal distance of 5,000 feet along the extended runway centerline.*
B. *Runway Larger Than Utility with a Visibility Minimum Greater Than: Mile Non-precision Instrument Approach Zone. Slopes thirty-four (34') feet outward for each foot upward beginning at the end of and at the same elevation as the primary surface and extending to a horizontal distance of 20,000 feet along the extended runway centerline.*
C. *Precision Instrument Runway Approach Zone. Slopes fifty (50') feet outward for each foot upward beginning at the end of and at the same elevation as the primary surface and extending to a horizontal distance of 10,000 feet along the extended runway centerline; thence slopes upward forty (40') feet horizontally for each foot vertically to an additional horizontal distance of 40,000 feet along the extended runway centerline.*
D. *Transitional Zones. Slopes upward and outward seven (7') feet horizontally for each foot vertically beginning at the sides of and at the same elevation as the primary surface and the approach zones, and extending to a height of 150 feet above the airport elevation. In addition to the foregoing, there are established height limits sloping upward seven (7') feet horizontally for each foot vertically beginning at the sides of and at the same elevation as the approach zones, and extending to where they intersect the conical surface.*
E. *Horizontal Zone. One hundred and fifty (150') feet above the airport elevation.*
F. *Conical Zone. Slopes upward and outward twenty (20') feet horizontally for each foot vertically beginning at the periphery of the horizontally zone and at one hundred fifty (150') feet above the airport elevation and extending to a height of 350 feet above the airport elevation.*

Use restrictions within the above zones include "*no use shall be made of land or water within any zone established by this Article in such a manner as to create electrical interference with navigational signals or radio communication between the Airport and aircraft, make it difficult for pilots to distinguish between airport lights and others, result in glare in the eyes of pilots using the Airport, impair visibility in the vicinity of the Airport or otherwise in any way create a hazard or endanger the landing, takeoff, or maneuvering of aircraft intending to use the Airport*."

Umatilla County

The Umatilla County Development Code includes an airport overlay zone designated "Airport Hazard Overlay Zone" to provide special considerations for areas around the airport. Specifically, "*(A) This overlay zone is adopted pursuant to the authority conferred by Oregon law. It is hereby found that an airport hazard endangers the lives and property of users of the Pendleton Municipal Airport, and property or occupants of land in its vicinity, and also if the obstruction type in effect reduces the size of the area available for the landing, takeoff, and maneuvering of aircraft, thus tending to destroy or impair the utility of the Pendleton Municipal Airport and the public investment therein.*

(B) Accordingly, it is declared that:

(1) The creation and establishment of an airport hazard is an injury to the region served by the Pendleton Municipal Airport;
(2) It is necessary, in the interest of the public health, public safety, and general welfare, that the creation or establishment of airport hazards be prevented; and
(3) The prevention of these hazards should be accomplished, to the extent legally possible, by the exercise of the police power, without compensation. It is further declared that both the prevention of the creation or establishment of airport hazards and the elimination, removal, alteration, mitigation, or marking and lighting of existing airport hazards are public purposes for which the city may raise and expend public funds and acquire land or interest in land" [5].

Regionally Significant Industrial Areas

The Airport Industrial Park was recently designated a Regionally Significant Industrial Area (RSIA) by the State of Oregon. The RSIA status allows a community to access current and anticipated state funding programs to develop the site in order to promote long-term job creation. It also expedites state site reviews and regulatory processes related to development with the RSIA.

Airport Industrial Property Evaluation

The airport encompasses 2,273 acres, which includes the airfield (runways, taxiways, and terminal facilities) and landside facilities including the aviation support facilities, general aviation area, and National Guard facilities. Additional land is reserved for the future UAS Business Park north of the airfield and additional and expanded support facilities south of the airfield. Beyond these existing and future core airport facilities the airport also encompasses the Airport Industrial Park located south of Airport Road.

[5] Ibid.

The land associated with the core airport facilities must be preserved for on-going aviation operations both existing and future. Land beyond that required for existing and future aviation needs has been evaluated to determine the practicality of requesting a release from FAA for the sale of this excess land. A potential property release will provide an additional source of revenue for airport operating and maintenance expenses.

Figure 9-3 depicts the Aeronautical Use Development Area land required for on-going airport operations throughout the planning period. This figure also depicts the Non-Aeronautical Use Development Area lands that have been identified as "excess" to future airport activity, which totals approximately 1,297 acres.

Of the 1,297 acres within the total Non-Aeronautical Use Development Area, approximately 552 acres has existing topography most suited for potential development. The Non-Aeronautical Use Development Area with the highest potential value, which comprises existing airport property that could be sold, is located in the Airport Industrial Park south of Northwest Avenue A and west of Airport Road as it connects with U.S. Highway 30/NW Pendleton Highway.

This area is currently serviced by utilities including water, sewer, and electric, with a storm drainage system in place. The relatively flat topography of the lots within the Industrial Park is also most suited for development and/or redevelopment, which could reduce the potential upgrade/redevelopment costs for any purchasers. The lots in the Airport Industrial Park are relatively small, which limits their potential for developments that would require larger lot sizes.

Many of the existing structures in the Industrial Park area are dated and in need of upgrades or replacement. The age and condition of many of these structures limits their current lease income potential. The cost of needed upgrades would be a financial burden to the City as the landlord since upgrades to these facilities would not be eligible for FAA funding. A sale of these properties would result in the new owners assuming the cost of any upgrades.

The proximity of the industrial Park land to both the Airport and Interstate 84 further enhances its appeal to purchasers who may require access to passenger air services, inbound or outbound airfreight shipments or overland shipping.

Additional airport land that may be considered for sale includes the Non-Aeronautical Use Development Area located north and west of the airfield, west of the future UAS Business Park, south of Daniel and Snyder Roads, and north of the western extension of Airport Road. The majority of this area is not currently served by utilities but does have topography suitable for future development. A 42 acre parcel located north of and along Airport Road immediately west of the NOAA site does have electric service nearby and water service available along Airport Road. The land use designation for this area is Airport Industrial with a Light Industrial zoning classification, both of which are compatible with current airport operations.

The sale and development of this land could also serve to expedite development of the UAS Business Park as upgraded access along Stage Gulch and Daniel Roads would be required to service this area. The City and a potential developer would have the option of sharing the cost of providing utilities to this area. Portions of this land lies under the outer approaches to Runways 7 and 11 and would be subject to avigation easements.

The Non-Aeronautical Use Development Area located generally to the south of Airport Road, other than the existing Industrial Park, would have less development potential with the exception of a 16 acre parcel that straddles the north and south sides of Airport Road west of the NOAA site. This 16 acre parcel would be suitable for development given its relatively level topography and existing Airport Industrial land use and Light Industrial zoning classifications. Other than this 16 acre parcel, the area south of Airport Road has relatively extreme topography and limited or no utilities. The costs associated with the required site preparation and extension of utilities into this area would likely be significantly greater than at the alternative sites discussed.

Phase II of the Pendleton Urban Fringe Land Use Study identified the major shortcoming associated with the large tracts of existing vacant airport land[6]. These tracts of land, while zoned for industrial development would only be available for lease by potential tenants, which significantly reduces their viability for such development. The study noted that only fifteen percent of industries are willing to lease rather than own the land. The study goes on to note there is a lack of large buildable sites of more than 50 acres within the City for development.

Sale of all or a portion of the Non-Aeronautical Use Development Area would provide the Airport with an additional source of funds for aeronautical development. The Non-Aeronautical Development Area outside of the Airport Industrial Park most suitable for future development totals approximately 536 acres, which represents a significant contiguous block of land that could be made available for development within the City of Pendleton.

A portion of this large 536-acre block of Non-Aeronautical Use Development Area has been previously designated with an Industrial Reserve land use classification and Exclusive Farm Use – County zoning designation. Therefore, it would be necessary for the zoning designation to be changed from EFU-CO to a Light Industrial classification before any development of this parcel could be undertaken. The remainder of the acreage within this 536 acre block of land has an Airport Industrial land use designation and is currently zoned Light Industrial, both of which are consistent with existing airport operations.

[6] Pendleton Urban Fringe Land Use Study, Phase II, July 1999

Figure 9-3 Aeronautical Use Development Area

Land Use Summary

The Eastern Oregon Regional Airport comprises a significant amount of land, more than 2,200 acres. An assessment of existing and future airport activity was accomplished to identify areas of Non-Aeronautical Use Development land that is not needed to support aviation activity. Significant portions of this land, more than 500 acres, are well suited to industrial development but constrained by the fact potential developers prefer to own the land their developments are located on rather than lease that land. With the exception of the land currently designated as Industrial Reserve, which has an Exclusive Farm Use – County zoning classification, this Non-Aeronautical Use Development Area has land use and zoning classifications consistent with on-going airport operations that also make them attractive to potential developers. The substantial contiguous acreage of this land makes it highly attractive to potential developers, especially given the lack of similarly sized parcels within the City. The sale of all or a portion of this land could provide a significant source of revenue to the City for on-going airport maintenance and development.

Chapter 10 – Financial and Development Program

EASTERN OREGON REGIONAL AIRPORT

Chapter 10 – Financial and Development Program

Introduction

The purpose of this chapter is to present the projects identified in the twenty-year Airport Capital Improvement Program (ACIP) that have been developed and assembled based on the analyses conducted in the Facility Requirements and Development Alternatives evaluations (Chapters Five and Seven). The ACIP projects are summarized in **Table 10-1** later in the chapter. The ACIP is organized into short, intermediate, and long-term planning periods that reflect both project prioritization and financial capabilities. Several factors were considered in determining project prioritization, including safety, forecast demand, the need to maintain/replace existing airfield facilities, and financial capabilities of both the City and FAA to support the development program based on existing funding mechanisms.

The Master Plan preferred alternative includes both airside elements and landside elements. Minor pavement maintenance items such as vegetation removal and crack filling are not included in the ACIP, but will need to be undertaken by the City on an annual or semi-annual basis.

A brief environmental review was prepared and is presented in Chapter Six and **Appendix A**. The review provides an overview of areas of potential concern associated with proposed development. In addition, all federally funded projects will require some level of project-specific environmental study, as determined by FAA.

Individual projects for the first five years of the planning period are listed in order of priority by year. Projects for the intermediate and long-term phases of the planning period (years 6-20) are listed in order of priority but have not been assigned a year. Each project's eligibility for FAA funding is noted, based on current federal legislation and funding formulas. Specific project details are depicted on the updated Airport Layout Plan and Terminal Area Plan drawings contained in Chapter Eight.

A primary source of potential funding identified in this plan is the FAA's Airport Improvement Program (AIP). As proposed, approximately 95 percent of the airport's twenty-year ACIP will be eligible for federal funding. Funds from this program are derived from the Aviation Trust Fund, which is the depository for all federal aviation taxes collected on such items as airline tickets, aviation fuel, lubricants, tires, aircraft registrations, and other aviation related fees. These funds are distributed by FAA under appropriations set by Congress for all airports in the United States included in the federal airport system (National Plan of Integrated Airport Systems – NPIAS).

However, as noted in **Table 10-1**, the projected twenty-year total for FAA eligible projects in the ACIP significantly exceeds current FAA funding levels through the non-primary entitlement program, which is $150,000 annually. While other types of FAA funding may be available for some projects, it is reasonable to assume not all eligible projects are likely to be funded despite establishing FAA funding eligibility. The City must maximize the use of available FAA and other outside funding sources as it manages its ACIP. In some cases, the limited availability of outside funds may require deferring some projects, or increasing funding with additional local, state, or private funding.

Airport Development Schedule and Cost Estimates

Cost estimates for each individual project were developed in 2016 dollars based on typical construction costs associated with the specific type of project. The project costs listed in the ACIP represent order-of-magnitude estimates that approximate design, engineering, environmental, other related costs, and contingencies. The estimates are intended only for preliminary planning and programming purposes. Specific project analysis and detailed engineering design will be required prior to project implementation to provide more refined and detailed estimates of the development costs.

These cost estimates can continue to assist management through adjustments to the 2016-dollar amounts to account for subsequent inflation as the plan is carried out in future years. This can be accomplished by converting the appropriate change in the United States Consumer Price Index (USCPI) to a multiplier using the following formula:

$$\frac{X}{I} = Y$$

Where:
X = USCPI in any given future year
Y = Change Ratio
I = Current Index (USCPI)[1]

USCPI-U
241.038 **(1982-1984 = 100)** **June 2016**

Multiplying the change ratio (Y) times any 2016-based cost estimate presented in this study will yield the adjusted dollar amounts appropriate in any future year evaluation. Several different CPI-based indices are available for use and any applicable index may be substituted by the City in its financial management program.

The following sections outline the recommended development program and funding assumptions. The scheduling has been prepared according to the facility requirements determined through the master plan evaluation. The projected staging of development projects is based on anticipated needs and investment priorities. Actual activity levels may vary from projected levels; therefore, the staging of development in this section should be viewed as a general guide. When activity does vary from projected levels, implementation of development projects should occur when demand warrants, rather than according to the estimated staging presented in this chapter. In addition to major projects, the airport will continue to require regular facility maintenance such as pavement maintenance, vegetation control, sweeping, lighting repair, and fuel system maintenance.

The following summary describes the key projects.

[1] U.S. Consumer Price Index for All Urban Consumers (USCPI-U)

Short-Term Projects

The short-term program contains highest priority work items including safety related improvements. These items will need to be incorporated into the State Capital Improvement Program (SCIP) managed by the FAA Seattle Airport District Office and the Oregon Department of Aviation (ODA). To assist with this process, the short-term projects are scheduled in specific calendar years for the first five years of the planning period (2016-2020).

The primary focus for short-term development is to address security, resolution of the existing hotspot situation, and taxiway and taxilane improvement. Specific Short-Term projects are listed below.

SHORT-TERM PROJECTS (1-5 YEARS):

- Fencing and Gates (Along NW 56th St. to Life Flight hangar);
- Runway 7/25 Overlay & Replace HIRL & PAPI's (Environmental/Pre-design);
- Runway 7/25 Overlay & Replace HIRL & PAPI's (Design);
- Runway 7/25 Overlay & Replace HIRL & PAPI's (Construction);
- Runway 29 End Reconfiguration & Hotspot Mitigation Project (Displace Runway 29, New Runway End Taxiway, New Aircraft Hold Area, Relocate PAPI) (Design and Environmental);

Intermediate & Long-Term Projects

Several intermediate or long-term projects are considered to be current needs. However, it was necessary to shift some projects to subsequent planning periods based on the limited funding resources available. Individual projects may be completed sooner in the event additional funding can be obtained.

INTERMEDIATE-TERM PROJECTS (6-10 YEARS):

- Pavement Management Plan (PMP) Work;
- Runway 29 End Reconfiguration & Hotspot Mitigation Project (Displace Runway 29, New Runway End Taxiway, New Aircraft Hold Area, Relocate PAPI) (Construction);
- Taxilane (North of Taxiway D to serve hangar development);
- Taxiway G Reconstruction;
- Taxiway D Extension (extend Taxiway D west).
- Main Apron Project (Overlay East End; New Markings and Tiedowns);
- New Snow Plow Vehicle;

- New Snow Blower Vehicle;
- SRE Building;
- Taxiway F Extension, Remove Taxiway B Connector, New Runway Exit Taxiway, and New Taxiway Connector (Between Taxiway A and Taxiway D);
- UAS Runway (2,800' x 60');
- North Access Road (to UAS Development);
- UAS Runway (2,800' x 60');
- UAS Parallel Taxiway;
- UAS Apron;
- Pavement Management Plan (PMP) Work;
- Taxiway F Extension, Remove Taxiway B Connector, New RWY Exit Taxiway, and New Taxiway Connector (Between Taxiway A and Taxiway D);

LONG-TERM PROJECTS (11-20 YEARS):

- Terminal Building 1st Floor Restroom Renovations;
- Taxilanes (east-west oriented, between existing and future T-hangars);
- Turf Runway (Between Runway 7/25 and Taxiway F Extension);
- Access Road and Parking (From NW 56th Street to hangar development);
- Runway 11 Taxiway Project (Extend Taxiway A to Runway 11 End; New Taxiway Between Runway 11 End & Runway 7 End);
- T-Hangar Replacement (Two 10-unit T-hangars);
- Pavement Management Plan (PMP) Work;
- AG Apron Reconstruction;
- Turf Runway (Between Runway 7/25 and Taxiway F Extension);
- Taxiway A Overlay;
- Runway 11 Taxiway Project (Extend Taxiway A to Runway 11 End; New Taxiway between Runway 11 End & Runway 7 End);
- Runway 11/29 Overlay; Reduce Width to 75 feet; Replace MIRL;
- Terminal Building TSA Screening Areas, Baggage Claim, Gate/Waiting Area;

- Taxilanes (north-south oriented, to support 4 T-hangar buildings);
- Pavement Management Plan (PMP) Work;
- Taxiway F Overlay;
- New Combination Snow Plow and Broom Vehicle;
- New ARFF Vehicle;
- Taxilane, Vehicle Parking, Access Road (Southwest of Main Apron);
- Beacon Replacement;
- Terminal Building Renovations (1st Floor West Side of building);
- Terminal Building Renovations (1st Floor East Side of building. Conversion to Offices);
- Pavement Management Plan (PMP) Work; and
- Airport Master Plan Update.

Table 10-1: 20-Year Capital Improvement Program

Table 10-1 (continued): 20-Year Capital Improvement Program

Table 10-1 (continued): 20-Year Capital Improvement Program

Capital Funding Sources & Programs

Federal Grants

Federal funding is provided through the Federal Airport Improvement Program (AIP). The Airport Improvement Program is the latest evolution of a funding program originally authorized by Congress in 1946 as the Federal Aid to Airports Program (FAAP). The AIP provides Entitlement funds for commercial service and cargo airports based on the number of annual enplaned passengers and amount of air cargo handled. Other appropriations of AIP funds go to states, general aviation airports, reliever airports, and other commercial service airports, as well as for noise compatibility planning. Any remaining AIP funds at the national level are designated as Discretionary funds and may be used by the FAA to fund eligible projects. Discretionary funds are typically used to enhance airport capacity, safety, and/or security and is often directed to specific national priorities such as the recent program to improve Runway Safety Areas. These annual entitlement funds can only be used for eligible capital improvement projects and may not be used to support airport operation and maintenance costs.

AIP funding programs include:

- AIP Entitlement Grants: The FAA Extension, Safety, and Security Act of 2016 was signed into law in July of 2016, extending short-term authorization for Federal Aviation Administration (FAA) programs and related revenue authorities through September 30, 2017.

- Eastern Oregon Regional Airport is classified in the current NPIAS as a Primary/Non-Hub commercial service airport. FAA Order 5100.38D, Airport Improvement Handbook, adjusts the percentage of Federal shares for allowable project costs for certain states. Table 4-8 "Federal Shares by Airport Classification in Public Land States", stipulates that the Federal match in the State of Oregon is 93.75 percent for Small or Non-Hub commercial service airports.

  Essential Air Service (EAS) communities in economically distressed areas, including Eastern Oregon Regional Airport can receive a 95 percent federal share. If the EAS subsidy were to go away, Eastern Oregon Regional Airport's federal share would change to 93.75 percent.

- AIP Discretionary Grants: The FAA also provides Discretionary grants to airports for projects that have a high Federal priority and enhance safety, security, or capacity. These grants are over and above Entitlement funding. Discretionary grant amounts can vary significantly compared to Entitlements and are awarded at the FAA's sole discretion. Discretionary grant applications are evaluated based on:
  - Need;
  - The FAA's project priority ranking system; and
  - The FAA's assessment of a project's significance within the national airport and airway system.
- FAA Facilities and Equipment Funds. Additional funds are available under the FAA Facilities and Equipment Program. Money is available in the FAA Facilities and Equipment (F&E) program to purchase navigation aids and air safety-related technical equipment, including Airport Traffic Control Towers (ATCTs) for use at commercial service airports in the National Airport System. Each F&E project is evaluated independently using a cost-benefit analysis to determine funding eligibility and priority ranking. Qualified projects are funded in total (i.e., 100 percent) by the FAA, while remaining projects would likely be eligible for funding through the AIP or PFC programs. In addition, an airport can apply for NAVAID maintenance funding through the F&E program for those facilities not funded through the F&E program

FAA funding is limited to projects that have a clearly defined need and are identified through preparation of an FAA approved Airport Layout Plan (ALP). Periodic updates of the ALP are required when new or unanticipated project needs or opportunities exist that require use of FAA funds and to reflect the status of completed projects. The FAA will generally not participate in projects involving vehicle parking, utilities, building renovations, or projects associated with non-aviation development.

Projects such as hangar construction or fuel systems are eligible for funding, although the FAA considers this category of project to be considered a much lower priority than other airfield needs.

State of Oregon

No specific level of Oregon Department of Aviation (ODA) funding has been assumed in the CIP presented in **Table 10-1**. It is recommended that the City maximize use of any ODA or other State of Oregon funds available in the planning period.

PAVEMENT MAINTENANCE PROGRAM

The Pavement Management Program (PMP) programs airfield pavement maintenance funds on established multi-year cycles. The PMP is funded by a portion of the fuel tax revenues. Forty-five percent of the original fuel taxes collected ($0.01/gallon on Jet-A and $0.09/gallon on AVGAS) are used to fund the PMP. (It should be noted that the remainder of the revenues collected from the original $0.01/gallon Jet-A and $0.09/gallon AVGAS fuel taxes equaling 55 percent are used to fund the operation of Oregon's 28 state owned airports and ODA administrative costs.) This program is intended to preserve and maintain existing airfield pavements in order to maximize their useful lives and the economic value of the pavement. Several short-term pavement maintenance projects are identified for Eastern Oregon Regional Airport in the most recent PMP as noted earlier. The program funds pavement maintenance and associated improvements (crack filling, repair, sealcoats, etc.), including some items that have not traditionally been eligible for FAA funding.

Funding for the PMP is generated through collection of aviation fuel taxes. ODA manages the PMP through an annual consultant services contract and work is programmed on a three-year regional rotation. The program includes a regular schedule of inspections and subsequent field work. Benefits from the PMP include:

- Economy of scale in bidding contracts;
- Federal/State/Local partnerships that maximize airport improvement funds; and
- PMP is not a grant program and local match is on a sliding scale (50% - 5% required).

The PMP includes the following features:

- Review prior year's Pavement Condition Index (PCI) reports;
- Only consider PCIs below 70;
- Apply budget;
- Limit work to patching, crack sealing, fog sealing, slurry sealing;
- Add allowance for markings; and
- Program to include approximately 20 airports per year, depending on funding levels.

FINANCIAL AID TO MUNICIPALITIES (FAM) GRANTS

ODA's Financial Aid to Municipalities (FAM) grant program has been suspended in recent years due to a lack of funding. House Bill 2075 (discussed later in this chapter) established a new source of funding revenue for aviation programs within the state. This bill resulted in the creation of three new programs that have essentially replaced FAM Grants. In order to facilitate these new programs, the rules used to administer funds under FAM have been amended to incorporate the language of House Bill 2075 and serve as the funding mechanism for these new programs.

CONNECT OREGON GRANTS

The Oregon Legislature authorized funding for air, marine, rail, and transit infrastructure, known as ConnectOregon in 2005. This program is intended to improve commerce, reduce delay, and enhance safety for the state's multi-modal transportation system.

Lottery-based bonds, sold by the Oregon Department of Administrative Services are used to fund the program. The funds are deposited into Oregon's Multimodal Transportation Fund and administered by the Oregon Department of Transportation Local Government Section. ConnectOregon funds cannot be used for projects eligible for Oregon's Highway Fund, thereby providing less competition for aviation projects seeking ConnectOregon funding.

In 2014, after the fifth installment of funding, the Legislature had provided $382 million to the program. Connect Oregon grants fund up to 80-percent of project costs with a 20-percent sponsor match and loans up to 100-percent of project costs.

The City applied for a 2016 Connect Oregon grant that would provide funding for the Pendleton Unmanned Aerial Systems Range, however the project was not one of the top 39 projects selected for funding as it was ranked number 49. Should the City reapply for funding of the UAS Range in the next ConnectOregon funding cycle, this project should stand a reasonable chance of receiving a ConnectOregon grant. This project would shift to the short-term planning period should funding be approved for the UAS project in the next ConnectOregon funding cycle.

HOUSE BILL 2075

House Bill 2075 (HR 2075) increased the tax on aircraft fuels, providing new revenues for the State Aviation Account. HR 2075 increased the fuel tax on both Jet-A and AVGAS by $0.02/gallon resulting in a new tax on Jet-A of $0.03 per gallon and AVGAS of $0.11 per gallon. The additional $0.02/gallon in revenues on Jet-A and AVGAS generated by HR 2075will be distributed to fund a variety of aviation needs through ODA's new Aviation System Action Program (ASAP) fund.

ASAP allocates and distributes the additional $0.02/gallon revenues generated by HR 2075 among three new programs: COAR - Critical Oregon Airport Relief Program; ROAR – Rural Oregon Aviation Relief Program; and SOAR – State Owned Airports Reserve Program. The specific programs are outlined below. COAR - Fifty percent of the revenues from the $0.02/gallon fuel tax increase will be distributed as follows:

(A) To assist airports in Oregon with match requirements for Federal Aviation Administration (FAA) Airport Improvement Program grants;

(B) To make grants for emergency preparedness and infrastructure projects, in accordance with the Oregon Resilience Plan, including seismic studies, emergency generators, etc.;

(C) To make grants for:
1. Services critical or essential to aviation including, but not limited to, fuel, sewer, water and weather equipment.
2. Aviation-related business development including, but not limited to, hangars, parking for business aircraft and related facilities.
3. Airport development for local economic benefit including, but not limited to, signs and marketing.

The City of Pendleton has applied for a COAR matching grant in the Fiscal Year 2017 FAA grant program for an environmental assessment and design work required for the Runway 29 threshold reconfiguration. The project tentatively scheduled to be constructed in 2022. However, the status of that grant is not yet known.

ROAR – Twenty-five percent of the revenues from the $0.02/gallon fuel tax increase will be distributed to assist commercial air service to rural Oregon.

SOAR – Twenty-five percent of the revenues from the $0.02/gallon fuel tax increase will be distributed to state owned airports for:

(A) Safety improvements recommended by the Oregon State Aviation Board and local community airports;
(B) Infrastructure projects at public use airports.

STATE CAPITAL IMPROVEMENT PROGRAM (SCIP)

The FAA's Seattle Airport District Office (ADO) is working with state aviation agencies in Oregon and Washington to develop a coordinated "State" Capital Improvement Program, known as the SCIP. The SCIP is intended to become the primary tool used by FAA, state aviation agencies, and local airport sponsors to prioritize funding. The program has reached full implementation with current and near-term future funding decisions prioritized through evaluation formulas. Airport sponsors are asked to provide annual updates to their short-term project lists in order to maintain a current system of defined project needs. The short-term priorities identified in the master plan CIP will be imported into the SCIP and will be subject to additional prioritization for funding in competitive statewide evaluations.

Local Funding

The locally funded (City/tenant) portion of the CIP for the twenty-year planning period is estimated to be approximately $1,508,984 as currently defined. Hangar and FBO building construction costs and building maintenance have not been included in the CIP, since no FAA funding is assumed.

A portion of local matching funds are generated through airport revenues, including fuel sales, land leases, and hangar rentals.

Airport sponsors occasionally fund infrastructure and revenue-generating development, including hangars and buildings, either through an inter fund loan or the issuance of long-term debt (revenue or general obligation bonds).

Airport Rates and Fees

The primary aviation use rates and fees at Eastern Oregon Regional Airport are summarized in **Table 10-2**. A review of existing rates and fees indicates that the airport's fee structure is generally comparable with other similarly sized Oregon airports. Rates at individual general aviation airports vary based primarily on market conditions. For example, hangar rental rates in the Portland metro area or in the Bend-Redmond area are typically higher than at airports in other parts of the state. An airport's ability to effectively raise rates must consider local and regional market conditions and the potential for nearby competitive airports to attract tenants through more economical rates. The rates and fees structure should be subject to regular review and adjustment to reflect inflation, market conditions and specific facility improvements.

TABLE 10-2: EORA LEASE RATES

Ground Lease Rate (Unimproved Land) per square foot: Ground Lease Rate (Improved Land) per square foot: Ground Lease Rate (Business/Industrial Park) per square foot: Terminal Building Lease Rate per square foot:	See **Table 10-3**
Hangar Lease Rate (Conventional Hangar) per square foot:	$0.25-1.10/SF/per month
Fuel Flowage Fee (Jet-A) per gallon:	$0.05/gallon
Fuel Flowage Fee (100LL) per gallon:	$0.05/gallon
Landing Fee (Air Carrier) per 1,000lbs MGLW:	$12.00 Flat fee
Landing Fee (Charter) per 1,000lbs MGLW:	$12.00 Flat fee
Landing Fee (Large GA) per 1,000lbs MGLW:	$12.00 Flat fee
Landing Fee (Cargo) per 1,000lbs MGLW:	$12.00 Flat fee
T-Hangar Lease Rate – Large & Small (Monthly):	$100-$125.00
Tiedown Lease Rate (Monthly):	No Charge
Terminal Vehicle Parking Fee (Daily):	No Charge

Note: Eastern Oregon Regional Airport lease rates were provided by the City of Pendleton.

TABLE 10-3: EASTERN OREGON REGIONAL AIRPORT LEASE RATES

GROUND LEASES (IMPROVED LAND ONLY)					
RATE CLASS:	AA	A	B	C	
Land Value:	$90,000.00	$25,000.00	$20,000.00	$15,000.00	Per Acre
Return:	10%	10%	10%	10%	
Annual:	9,000.00	$2,500.00	$2,000.00	$1,500.00	Per Acre
Monthly:	$750.00	$208.33	$166.67	$125.00	Per Acre

CLASS	LOCATION	$/ACRE	$/SQ. FT. / YEAR	$/SQ. FT. / MONTH
AA	Airfield Associated	$90,000	$0.207	$0.0172
A	A Ave.	$25,000	$0.057	$0.0048
A	Airport Road	$25,000	$0.057	$0.0048
A	56th Street	$25,000	$0.057	$0.0048
B	49th Street	$20,000	$0.046	$0.0038
B	B Avenue	$20,000	$0.046	$0.0038
B	C Avenue	$20,000	$0.046	$0.0038
B	H Avenue	$20,000	$0.046	$0.0038
C	All Others	$15,000	$0.034	$0.0029

Existing Buildings and Terminal Space

	NEW RATES				
RATE CLASS:	AA & TS	A	B	C	
Pendleton	0.500	0.330	0.250	0.150	Price/Sq. Ft.

Note: Lease rate information and classifications were provided by the City of Pendleton.

Cash Flow Analysis

A projection of airport operating revenues and expenses for the twenty-year planning period is presented in **Table 10-4,** based on data provided by the city and the noted assumptions on future events. According to the City of Pendleton's 2014/15 and 2015/16 Audits, the airport is currently operating in a deficit (based on operating revenues and expenses only). The general operating position of the airport is expected to improve as specific facility improvements occur and overall airport activity increases. Basic business decisions will need to be made regarding the financial feasibility of renovating individual city-owned buildings. These decisions should be made based on market conditions, expected return on investment, and any intangible benefits provided to the community that would result from the project.

The airport has three primary revenue categories: user charges, land leases, buildings and facilities. The current rates and fees structure appear to be generally in line with market rates at other general aviation airports in the region. For the purposes of projecting future revenues, it is assumed that revenues will increase at an average rate of 3.5 percent annually, through the twenty-year planning period. This rate assumes both an increase in revenue-producing activities on the airport (new leases, fuel sales, etc.) and periodic increases in current rates and fees to account for inflation and market conditions.

The current level of maintenance and operating expenses is considered to be reasonable based on the size of the facility and reflects the efficient use of staff and outside resources. For the purposes of projecting future revenues, it is assumed that expenses will increase at an average rate of 3 percent annually, through the twenty-year planning period. Additional maintenance expenses are also anticipated as the airfield continues to expand physically. Although the precise staging of facility expansion will depend on market demand and availability of funding the new facilities identified in the twenty-year CIP. The costs of maintaining the airfield can be reasonably expected to increase incrementally as the facility expands.

Ongoing capital improvement expenditures will include local match for state and federal grants and the full or partial cost of projects not eligible for FAA or state funding.

Table 10-4: Operating Revenues and Expenses

Revenue Assumptions:

A. Land leases increase at 3.5% per year (inflation factor) with specific bumps for additional leases estimated two or three new conventional hangar every 5 years (based on Facility Requirements hangar needs). The hangar needs do not include aircraft that may be displaced if the EAA hangar is removed. *These numbers may vary based on the actual size of future hangars and actual year of construction.*

   1. (2020) Two new 50x50 foot hangar ground lease (initial revenue $1,700/yr. at current $.34sq/ft. lease rates).
   2. (2025) Three new 50x50 foot hangar ground lease (initial revenue $2,775/yr. at future estimated $.37 sq/ft. lease rates).
   3. (2030) Three new 50x50 foot hangar ground lease (initial revenue $3,150/yr. at future estimated $.42 sq/ft. lease rates).
   4. (2035) Three new 50x50 foot hangar ground lease (initial revenue $3,375/yr. at future estimated $.45 sq/ft. lease rates).

B. Building leases increase at 3.5% per year (inflation factor). No plans of any future City owned hangar buildings to be constructed in the next 20 years.

C. FBO income increase at 3.5% per year (inflation factor).

D. Tie-downs increase at 3.5% per year (inflation factor).

E. Fuel flowage increase at 3.5% per year (inflation factor).

F. Interest income remains flat at $300 per year (based off current interest income for 2013-2014).

Expense Assumptions:

A. Operating expenses assumed to increase at 3% per year (inflation factor).

B. No increase in airport staffing assumed.

Chapter 11 – Planning for Compliance & Solid Waste Recycling Plan

EASTERN OREGON REGIONAL AIRPORT

Chapter 11 – Planning for Compliance & Solid Waste Recycling Plan

Introduction

This chapter discusses the elements associated with the operation and management of Eastern Oregon Regional Airport, as a federally-obligated airport. The Federal Aviation Administration encourages airport sponsors to establish and implement programs that promote sound operating practices and ongoing compliance with regulatory requirements. The FAA currently recommends that compliance be addressed during the airport planning process through the review of airport plans and documents. Documents include: the approved Airport Layout Plan, Exhibit" A" Property Map, any airport ordinances, any applicable zoning ordinance(s), airport rules and regulations, airport minimum standards, airport budgets, leases, easements, permits, and any other applicable documents.

Airport compliance review is ultimately the responsibility of the FAA and the findings in the Master Plan represent conditions when the Master Plan was prepared. The review presented in this document is not all encompassing, and does not serve as a substitute for FAA's ultimate oversight role.

City of Pendleton Compliance

The City of Pendleton maintains a high degree of control over the operation of Eastern Oregon Regional Airport. The City meets all applicable financial reporting and record keeping requirements. The City employs a variety of "best practices" including: periodic review of market rates and fees; land appraisals; formal procurement and contracting practices; coordination with adjacent land owners (Avigation easements), and coordination with local (land use planning, zoning); state (airport overlay zoning, environmental agencies, etc.); and tribal government rules and regulations.

There are no known compliance issues associated with airport development, tenant leases, land leases, or other items.

FAA Compliance Summary

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

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

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

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

Land use compliance and compatible land use planning is often a significant compliance issue for airports. Compliance and suggested best practices are discussed under the following subheadings in this chapter:

- Airport Compliance with Federal and State Grant Assurances;
- Environmental Compliance;
- Airport User Compliance;
- Other Airport Operational Policies and Procedures.

Airport Compliance with Federal and State Grant Assurances

The City of Pendleton, as a recipient of federal airport improvement grant funds is contractually bound to various sponsor obligations referred to as "Grant Assurances" that have been compiled by the FAA. These obligations, presented in detail in federal grants and state statutes and administrative codes, document the commitments made by the City of Pendleton to fulfill the intent of the grantor (FAA) resulting from acceptance of federal funding for airport improvements. Failure to comply with the grant assurances may result in a finding of noncompliance and/or forfeiture of future funding. Grant assurances and their associated requirements are intended to protect the significant investment made by the FAA to preserve and maintain the nation's airports as a valuable national transportation asset, as mandated by Congress.

FAA GRANT ASSURANCES

The FAA's Airport Compliance Program defines the interpretation, administration, and oversight of federal sponsor obligations contained in grant assurances. FAA Order 5190.6B, defines policies and procedures for the Airport Compliance Program. Although it is not regulatory or controlling with regard to airport sponsor conduct, Order 5190.6B establishes the policies and procedures for FAA personnel to follow in carrying out the FAA's responsibilities for ensuring compliance by the sponsor.

Order 5190.6B states: the FAA Airport Compliance Program is, "…designed to monitor and enforce obligations agreed to by airport sponsors in exchange for valuable benefits and rights granted by the United States in return for substantial direct grants of funds and for conveyances of federal property for airport purposes. The Airport Compliance Program is designed to protect the public interest in civil aviation. Grants and property conveyances are made in exchange for binding commitments (federal obligations) designed to ensure that the public interest in civil aviation will be served. The FAA bears the important responsibility of seeing that these commitments are met. This order addresses the types of commitments, how they apply to airports, and what FAA personnel are required to do to enforce them."

It is important to understand the FAA's goals for a national airport system to better understand the intent of the FAA Compliance Program. The national airport system is currently known as the National Plan of Integrated Airport Systems (NPIAS), which has historic origins dating back to the 1946 Federal Airports Act. The airport system has evolved through several legislative updates in concert with changes in the organization and scope of the FAA. The NPIAS was adopted as part of the Airport and Airway Development Act of 1982, replacing the National Airport System Plan (NASP), created by earlier legislation. There are approximately 2,500 general aviation airports and 800 commercial service airports currently in the NPIAS.

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

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

FAA Airport Improvement Program (AIP) grant assurances are summarized and categorized in **Table 11-1.**

TABLE 11-1: SUMMARY OF FAA AIP GRANT ASSURANCES (AIRPORT SPONSOR ASSURANCES 3/2014)

GRANT ASSURANCE NO.	GENERAL AIRPORT	PROJECT PLANNING / DESIGN & CONTRACTING	AIRPORT OPERATIONS AND LAND USE	DAY TO DAY AIRPORT MANAGEMENT	PROJECT CONSTRUCTION	LEASES & FINANCIAL	OTHER
1. General Federal Requirements	■						
2. Responsibility and Authority of the Sponsor		■					
3. Sponsor Fund Availability		■					
4. Good Title	■						
5. Preserving Rights and Powers	■						
6. Consistency with Local Plans		■					
7. Consideration of Local Interest		■					
8. Consultation with Users		■					
9. Public Hearings		■					
10. Metropolitan Planning Organization		■					
11. Pavement Preventative Maintenance			■				
12. Terminal Development Prerequisites							■
13. Accounting System, Audit, and Record Keeping Requirements		■					
14. Minimum Wage Rates		■					
15. Veteran's Preference		■					
16. Conformity to Plans and Specifications		■					
17. Construction Inspection and Approval					■		
18. Planning Projects		■					
19. Operations and Maintenance			■				
20. Hazard Removal and Mitigation			■				
21. Compatible Land Use			■				
22. Economic Nondiscrimination				■			
23. Exclusive Rights				■			
24. Fee and Rental Structure						■	
25. Airport Revenues						■	
26. Reports and Inspections				■			
27. Use by Government Aircraft							■
28. Land for Federal Facilities							■

GRANT ASSURANCE NO.	GENERAL AIRPORT	PROJECT PLANNING / DESIGN & CONTRACTING	AIRPORT OPERATIONS AND LAND USE	DAY TO DAY AIRPORT MANAGEMENT	PROJECT CONSTRUCTION	LEASES & FINANCIAL	OTHER
29. Airport Layout Plans	■						
30. Civil Rights		■					
31. Disposal of Land	■						
32. Engineering and Design Services		■			■		
33. Foreign Market Restrictions		■					
34. Policies, Standards and Specifications		■					
35. Relocation and Real Property Acquisition		■					
36. Access by Intercity Bus							■
37. Disadvantaged Business Enterprises		■			■		
38. Hangar Construction				■			
39. Competitive Access							■

While sponsors should understand and comply with all grant assurances, there are several assurances that are common and recurring issues for airport sponsors. These are summarized in more detail below. A complete description of current AIP grant assurances is provided in **Appendix D**. It is important to note that the assurances (and corresponding numbers) are applied to non-airport sponsors undertaking noise compatibility program projects and planning agency sponsors. These can also be found in the Airport Improvement Program (AIP) under Grant Assurances.

The City of Pendleton as the airport sponsor, is responsible for the direct control and operation of Eastern Oregon Regional Airport. Familiarity with proper monitoring and implementation of sponsor obligations and FAA grant assurances in particular, are keys to maintaining compliance. FAA Order 5190.6B and ongoing communication with the FAA Northwest Mountain Region Compliance Office are both excellent resources when addressing policy and compliance.

DURATION

The terms, conditions, and assurances of a grant agreement with the FAA remain in effect for the useful life of a development project, which is typically 20 years from the receipt of the most recent grant. However, terms, conditions, and assurances associated with land purchased with federal funds do not expire.

The airport sponsor should have a clear understanding of and comply with all assurances. The following sections were excerpted (without revision) from published FAA guidance for more detail.

Project Planning, Design, and Contracting

Sponsor Fund Availability (Assurance #3)

Once a grant is given to an airport sponsor, the receiving sponsor commits to providing the funding to cover their portion of the total project cost. Currently this amount is ten percent of the total eligible project cost, although it may be higher depending on the particular project components or makeup. Once the project has been completed, the receiving airport also commits to having adequate funds to maintain and operate the airport in the appropriate manner to protect the investment in accordance with the terms of the assurances attached to and made a part of the grant agreement.

Consistency with Local Plans (Assurance #6)

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

In addition to understanding local plans, airport sponsors should be proactive in order to prevent noncompliance with this assurance. The airport sponsor should assist in the development of local plans that incorporate the airport and consider its unique aviation related needs. Sponsor efforts should include the development of goals, policies, and implementation strategies to protect the airport as part of local plans and ordinances.

Accounting System Audit and Record Keeping (Assurance #13)

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

GENERAL AIRPORT

Good title (Assurance #4)

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

Preserving Rights and Powers (Assurance #5)

No actions are allowed that might take away any rights or powers from the sponsor, which are necessary for the sponsor to perform or fulfill any conditions set forth by the assurance included as part of the grant agreement. If there is an action taken or activity permitted that might hinder any of those rights or powers it should be discontinued. An example of an action that can adversely affect the rights and powers of the airport is a Through-the-Fence (TTF) activity. TTF activities allow access to airport facilities from off-airport users. In many instances, the airport sponsor cannot control the activities of those operating off the airport resulting in less sponsor control. This loss of control can potentially have an adverse impact on other airport users. For example, TTF activities often do not pay the same rates and charges as on-airport users, resulting in the potential for an unfair competitive advantage for businesses and users located off-airport.

Airport Layout Plan (ALP) (Assurance #29)

The airport should at all times keep an up-to-date ALP, which should include current and future boundaries, facilities/structures, locations of non-aviation areas, and existing improvements. No changes should be made at the airport to hinder the safety of operations; also, no changes should be made to the airport that are not in conformity with the ALP. Any changes of this nature could adversely affect the safety, utility, or efficiency of the airport. If any changes are made to the airport without authorization the alteration must be changed back to its original condition or the airport will have to bear all costs associated with moving or changing the alteration to an acceptable design or location. Additionally, no federal participation will occur for improvement projects not shown on an approved ALP.

Disposal of Land (Assurance #31)

Land purchased with the financial participation of an FAA Grant cannot be sold or disposed of by the airport sponsor at their sole discretion. Disposal of such lands are subject to FAA approval and a definitive process established by the FAA. If airport land is no longer considered necessary for airport purposes, and the sale is authorized by the FAA, the land must be sold at fair market value. Proceeds from the sale of the land must either be repaid to the FAA, or reinvested into another eligible airport improvement or noise compatibility project. Land disposal requirements typically arise when a community is building a new airport and the land on which the airport was located is sold with the proceeds used to offset costs of the new airport. In general, land purchased with FAA funds is rarely sold by a sponsor.

AIRPORT OPERATIONS AND LAND USE

Pavement Preventative Maintenance (Assurance #11)

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

Operations and Maintenance (Assurance #19)

All federally funded airport facilities must operate at all times in a safe and serviceable manner. The airport sponsor should not allow for any activities that inhibit or prevent safe and serviceable operations. The airport sponsor must always promptly mark and light any hazards on the airport, and promptly issue Notices to Airmen (NOTAMs) to advise of any conditions that could affect safe aeronautical use. Exceptions to this assurance include when temporary weather conditions make it unreasonable to maintain the airport. Further, this assurance does not require the airport sponsor to repair conditions that have happened because of a situation beyond the control of the sponsor.

Compatible Land Use (Assurance #21)

Land uses around an airport should be planned and implemented in a manner that ensures surrounding development and activities are compatible with the airport. To ensure compatibility, the sponsor is expected to take appropriate action, to the extent reasonable, including the adoption of zoning laws to guide land use in the vicinity of airports under their jurisdiction. Incompatible land use around airports represents one of the greatest threats to the future viability of an airport.

DAY-TO-DAY AIRPORT MANAGEMENT

Economic Non-Discrimination (Assurance #22)

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

- All FBOs on the airport should be subject to the same rate fees, rentals, and other charges.
- All persons, firms, or corporations operating aircraft can work on their own aircraft with their own employees.
- If the airport sponsor at any time exercises the rights and privileges of this assurance, they will be under all the same conditions as any other airport user would be.
- The sponsor can establish fair conditions, which need to be met by all airport users to make the airport safer and more efficient.

The sponsor can prohibit any type, kind, or class of aeronautical activity if it is for the safety of the airport. An example of an activity that may be considered for prohibition is sky diving. It is important to point out that the FAA will review such prohibitions and make the final determination as to whether or not a particular activity type is deemed unsafe at the airport based on current operational dynamics.

Exclusive Rights (Assurance #23)

Exclusive rights at an airport are often a complicated subject usually specific to individual airport situations. The assurance states the sponsor "will permit no exclusive right for the use of the airport by any person providing, or intending to provide, aeronautical services to the public…" However, there are exceptions to this rule. If the airport sponsor can prove that permitting a similar business would be unreasonably costly, impractical, or result in a safety concern, the sponsor may consider granting an exclusive right. To deny a business opportunity because of safety, the sponsor must demonstrate how that particular business will compromise safety at the airport. Exclusive rights are very often found in airport relationships with fixed base operators (FBO), but exclusive rights can also be established with any other business at the airport that could assist in the operation of an aircraft at the airport. If an unapproved exclusive rights agreement exists, it must be dissolved before a future federal grant can be awarded to the airport.

If a sponsor is contemplating denial of a business use at the airport, it is strongly encouraged that they contact their FAA Airports District Office (ADO) in order to ensure they have all the necessary information and that denial of access is not going to be seen as unjust discrimination. For more in-depth information on exclusive rights reference **Advisory Circular 150/5190-6**, "Exclusive Rights at Federally Obligated Airports."

LEASES AND FINANCES

Fee and Rental Structure (Assurance #24)

Simply put, the fee and rental structure at the airport must be implemented with the goal of generating enough revenue from airport related fees and rents to become self-sufficient in funding day to day operational needs. The airport sponsor should routinely monitor its fee and rental structure to ensure reasonable fees are being charged to meet this goal. Common fees charged by airports include fuel flowage, tie-down, landing fees, and hangar rent.

Airport Revenue (Assurance #25)

All airport revenue and local taxes on aviation fuel should be used for the operating costs of the airport, the local airport system, or other local facilities owned by the same owner of the airport or for noise mitigation on or off airport property. In other words, revenue generated by airport activities must be used to support the continued operation and maintenance of the airport. Use of airport revenue to support or subsidize other non-aviation activities or functions of the sponsor is prohibited and is considered revenue diversion. Revenue diversion is a significant compliance issue subject to close scrutiny by the FAA.

Title 14 Code of Federal Regulation (CFR) Part 139 Requirements

14 CFR Part 139 is a federal regulation that requires FAA to issue Airport Operating Certificates to airports that:

- Serve scheduled and unscheduled air carrier aircraft with more than 30 seats;
- Serve scheduled air carrier operations in aircraft with more than 9 seats but less than 31 seats; and
- The FAA Administrator requires to have a certificate.

The Airport Operating Certificates are intended to ensure safety in air transportation. An airport must agree to certain operational and safety standards to obtain a certificate. These operational and safety standards vary depending on the size of the airport and type of flights available. The regulation allows FAA to issue certain exemptions for airports serving limited numbers of passengers yearly where some requirements of the Airport Operating Certificate might create a financial hardship.

There are four classes of airports established under 14 CFR Part 139, described as follows:

- **Class I** - airport is an airport certificated to serve scheduled operations of large air carrier aircraft and can also serve unscheduled passenger operations of large air carrier aircraft and/or scheduled operations of small air carrier aircraft;

- **Class II** - airport is an airport certificated to serve scheduled operations of small air carrier aircraft and unscheduled passenger operations of large air carrier aircraft. A Class II airport cannot serve scheduled large air carrier aircraft;

- **Class III** - airport is an airport certificated to serve scheduled operations of small air carrier aircraft. A Class III airport cannot serve scheduled or unscheduled large air carrier aircraft;

- **Class IV** - airport is an airport certificated to serve unscheduled passenger operations of large air carrier aircraft. A Class IV airport cannot serve scheduled large or small air carrier aircraft.

Eastern Oregon Regional Airport operates under a Class IV Airport Operating Certificate as set out in 14 CFR Part 139. **Table 11-2** lists the specific requirements each Class of airport with an Airport Operating Certificate must adhere to with the Class IV requirements.

Other FAA Compliance Requirements

OTHER FEDERAL CONTRACTING AND PROCUREMENT DOCUMENTS

Airport sponsors who accept an FAA Airport Improvement Program (AIP) grant, agree to adhere to all applicable federal contracting and procurement requirements. Advisory circulars are required for use in AIP funded projects. Included in each grant request is a federal funding checklist that identifies the requirements an airport should consider before accepting the grant. The following items are noted in the checklist:

- ALP's should be up to date;
- Exhibit A Property Map may need to be updated if acquiring additional property;
- Land Inventory may need to be updated if you have recently acquired land with federal assistance;
- Airports must hold good title to the airport landing area;
- Appropriate signage and markings must be in place;
- Runway Protection Zone and approach surface deficiencies must be identified and steps to address deficiencies must be noted;
- Runway Safety Areas must meet FAA standards if planning a runway project;
- Disadvantaged Business Enterprise program goals must be met on projects of more than $250,000;
- Procedures should be in place to handle bid protests;
- Open AIP grant projects need to be identified;
- Project closeout forms must be submitted within 90 days of work completion;
- A "Certification of Economic Justification" must be included for routine pavement maintenance projects;
- A "Revenue Generating Facility Eligibility Evaluation" must be completed for hangar construction or fueling facilities;
- A "Reimbursable Agreement" and "Non-Fed Coordination" must be completed for navigational aid projects;
- A "Relocation Plan" must be completed if a project requires residences or businesses to be relocated.

TABLE 11-2 REQUIRED AIRPORT CERTIFICATION MANUAL ELEMENTS

MANUAL ELEMENTS	AIRPORT CERTIFICATE CLASS			
	Class I	Class II	Class III	Class IV
1. Lines of succession of airport operational responsibility	X	X	X	X
2. Each current exemption issued to the airport from the requirements of this part	X	X	X	X
3. Any limitations imposed by the Administrator	X	X	X	X
4. A grid map or other means of identifying locations and terrain features on and around the airport that are significant to emergency operations	X	X	X	X
5. The location of each obstruction required to be lighted or marked within the airport's area of authority	X	X	X	X
6. A description of each movement area available for air carriers and its safety areas, and each road described in § 139.319(k) that serves it	X	X	X	X
7. Procedures for avoidance of interruption or failure during construction work of utilities serving facilities or NAVAIDS that support air carrier operations	X	X	X	
8. A description of the system for maintaining records, as required under § 139.301	X	X	X	X
9. A description of personnel training, as required under § 139.303	X	X	X	X
10. Procedures for maintaining the paved areas, as required under § 139.305	X	X	X	X
11. Procedures for maintaining the unpaved areas, as required under § 139.307	X	X	X	X
12. Procedures for maintaining the safety areas, as required under § 139.309	X	X	X	X
13. A plan showing the runway and taxiway identification system, including the location and inscription of signs, runway markings, and holding position markings, as required under § 139.311	X	X	X	X
14. A description of, and procedures for maintaining, the marking, signs, and lighting systems, as required under § 139.311	X	X	X	X
15. A snow and ice control plan, as required under § 139.313	X	X	X	
16. A description of the facilities, equipment, personnel, and procedures for meeting the aircraft rescue and firefighting requirements, in accordance with §§ 139.315, 139.317 and 139.319	X	X	X	X
17. A description of any approved exemption to aircraft rescue and firefighting requirements, as authorized under § 139.111	X	X	X	X
18. Procedures for protecting persons and property during the storing, dispensing, and handling of fuel and other hazardous substances and materials, as required under § 139.321	X	X	X	X
19. A description of, and procedures for maintaining, the traffic and wind direction indicators, as required under § 139.323	X	X	X	X
20. An emergency plan as required under § 139.325	X	X	X	X
21. Procedures for conducting the self-inspection program, as required under § 139.327	X	X	X	X
22. Procedures for controlling pedestrians and ground vehicles in movement areas and safety areas, as required under § 139.329	X	X	X	X
23. Procedures for obstruction removal, marking, or lighting, as required under § 139.331	X	X	X	X
24. Procedures for protection of NAVAIDS, as required under § 139.333	X	X	X	
25. A description of public protection, as required under § 139.335	X	X	X	
26. Procedures for wildlife hazard management, as required under § 139.337	X	X	X	
27. Procedures for airport condition reporting, as required under § 139.339	X	X	X	X
28. Procedures for identifying, marking, and lighting construction and other unserviceable areas, as required under § 139.341	X	X	X	
29. Any other item that the Administrator finds is necessary to ensure safety in air transportation	X	X	X	X

[Doc. No. FAA–2000–7479, 69 FR 6424, Feb. 10, 2004; Amendment. 139–26, 69 FR 31522, June 4, 2004, as amended by Amendment. 139–27, 78 FR 3316, Jan. 16, 2013]

SPECIAL CONDITIONS

In addition to the standard grant assurances discussed above, the state or FAA may require "Special Conditions" to individual grants that supplement or expand the standard grant assurances. Special Conditions are unique to an individual airport and can be project or administrative in nature. Airport sponsors need to be aware of such conditions that may be applied to their grants.

MULTIJURISDICTIONAL CHALLENGES

In some instances, airports are jointly owned and operated by more than one airport sponsor. In other instances, airports may be located within multiple jurisdictions. While the official airport sponsor is ultimately responsible for adherence with the grant assurance, the actions, or inactions, of surrounding jurisdictions can and do affect the airport sponsor's ability to meet its obligations. This is particularly true with land use compatibility issues around airports. As a result, it is important that all jurisdictions affected by the airport understand the operational needs and complexities of having an airport within its jurisdiction. Mutual agreements addressing airport operational or land use protection needs, or other cooperative measures, are recommended for all jurisdictions to both protect the functionality of the airport and the safety and well-being of airport users and neighbors.

FAA THROUGH-THE-FENCE (TTF)

Through-the-Fence access is discouraged by FAA due to concerns over land use compatibility, security, safety, and economic inequity (economic discrimination) between on- and off-airport users. Economic discrimination is "*an unjust economic advantage or disadvantage for one airport user versus another by charging one more or less than another, and therefore creating an advantage or disadvantage.*" However, when a through-the-fence use exists or is proposed, the FAA requires airport sponsors to develop access plans and establish agreements consistent with FAA grant assurances. To maintain economic parity within the agreements, through-the-fence users are typically required to compensate the airport owner for the access in a way that is comparable to an equivalent on-airport user.

Eastern Oregon Regional Airport has no through-the-fence users.

Solid Waste and Recycling Plan

Introduction

This section of the chapter discusses the solid waste generation at the Airport and what recycling options are available. The layout of this section is outlined below:

- Waste Audit
- Recycling Feasibility
- Plan to Minimize Solid Waste Generation
- Operational and Maintenance Requirements
- Waste Management Contracts
- Potential for Cost Savings or Revenue Generation
- Future Development and Recommendations

WASTE AUDIT

Minimal waste is generated at the Eastern Oregon Regional Airport due to the limited size of the facility. Specific sources of waste on site include tenants of private hangars, the Pendleton Aviation FBO tenant and their users, and tenants and users of the airport terminal building including Seaport Airlines and the rental car agencies. The private hangar and FBO tenants are individually responsible for waste generated by their operations. The City of Pendleton contracts with Pendleton Sanitary Services to provide trash and limited recycling service. A six-yard frontload container, which is emptied every Wednesday is provided for terminal building tenants. Recycling containers are also provided for magazines, newspaper, and telephone books. Trash is hauled to the Pendleton Sanitary Services transfer station at 5500 NW Reith Road in Pendleton.

WASTE DISPOSAL

Each individual tenant is also responsible for disposal and recycling of their own waste as stipulated in their leases with the City of Pendleton. Pendleton Sanitary Service services the airport area and would be the contractor each tenant would contract with for waste and recycling hauling to the Pendleton transfer station located about 1.5 miles south of the airport. No State or Federal requirements apply to the waste generated. Pendleton Sanitary Service also provides commingled curbside recycling of aluminum, newspaper, magazines, phone books, and motor oil within the city of Pendleton. Non-standard recyclables including glass, tin cans, appliances, scrap metal, yard waste, batteries, and electronics would need to be transported to the Transfer Station on Reith Road.

The nearest landfill is Finley Buttes Landfill, located approximately 12 miles south of Boardman, Oregon, off Interstate 84 exit 168. The entrance to the landfill is located at 73221 Bombing Range Road, which is approximately 45 miles west of the Eastern Oregon Regional Airport via Interstate 84. The Finley Buttes Landfill accepts municipal solid wastes, construction/demolition wastes and with proper approval special wastes (including liquids). The landfill can provide transportation and disposal services for municipal solid waste, industrial waste, and special wastes including asbestos, and non-hazardous contaminated soils. Scrap tire hauling and processing is available in addition to transportation and disposal services for construction and demolition wastes and transportation of large demolition projects using walking floor trailers. The only items not accepted at the Finley Buttes Landfill are household hazardous wastes.

CONSTRUCTION WASTE

Construction waste is the responsibility of the Contractor for each specific project. Projects identified on the 5-year CIP are listed in **Table 11-3** below.

2016

Waste resulting from projects in 2016 would be debris generated by the tree removal and asphalt pavement waste generated by the reconstruction of the apron and taxilane and any clearing/grubbing associated with that project. The waste produced would have to be removed at the Contractor's expense.

2017

No demolition or construction waste is anticipated in 2018 because these projects would be new construction.

2018

Waste resulting from projects in 2018 would be generated by the construction of the gravel road and vehicle parking area and any clearing and grubbing associated with those projects. The waste produced would have to be removed at the Contractor's expense.

2019

No demolition or construction waste is anticipated in 2019 because these projects would be new construction.

2020

Demolition and construction waste would result from removed asphalt pavement and any clearing and grubbing associated with the taxiway extension. The waste produced would have to be removed at the Contractor's expense.

TABLE 11-3: SUMMARY OF FUTURE PROJECTS

SHORT-TERM	PROJECT
2016	Tree Clearing - RWY 16 RPZ (Avigation Easement)
	Runway - Sealcoat/Repaint Markings
	Parallel Taxiway and Mid-Field Exit Taxiway - Sealcoat/Repaint Markings
	Main Apron, South Entrance Taxiway, North Taxilane-Sealcoat/Repaint Markings
	Apron and Taxilane Reconstruction (off-airport)
2017	Install Automated Weather Observation System (AWOS)
	Install Vehicle Automated Gate and Fencing (Airport Entrance from Kehl Rd)
2018	Phase 1 Landside Improvements (Hangar Area) - Gravel Road and Vehicle Parking
	Phase 1 Landside Improvements (Hangar Area) - Extend Electrical Service (underground)
2019	Relocate Segmented Circle and Install New Windcone
	Parallel Taxiway Edge Reflectors (Replacement)
2020	Phase 2 Landside Improvements - Taxiway Extension and Taxiway Removal

Recycling Feasibility

Recycling services currently available at the airport are limited to magazines, newspaper, and telephone books. The Pendleton Sanitary Service transfer station however, can facilitate items beyond those accepted at the airport. In addition, Pendleton Sanitary Service also provides a Recycle Depot at Southwest 18th Street and Byers Avenue. **Table 11-4** lists recyclables accepted at the Pendleton Sanitary Service Recycle Depot and the Transfer Station.

TABLE 11-4: PENDLETON AREA RECYCLING OPTIONS

RECYCLE DEPOT	TRANSFER STATION
Newspapers, Magazines, and Phone Books	Motor Oil
Cardboard (corrugated only, flattened)	Appliances
Aluminum (clean foil, pop cans, pie plates)	Scrap Metal
Tin Cans	Wood Waste (clean pallets and lumber)
Glass (jars and bottles only)	Yard Waste (grass, limbs, leaves, and brush)
Plastic (plastic bottles, tubs, nursery pots, and buckets)	Batteries (vehicle batteries only)
Office Paper (white or pastel colored, envelopes, junk mail, file folders, and manila envelopes)	Electronics (computers, monitors, and televisions)

CURRENT PRACTICES

According to OAR 340-090-0040, cities with a population greater than 4,000 residents must maintain some sort of recycling option. The 2014 PSU certified population estimate for the City of Pendleton was 16,700 residents. The U.S. Census Bureau lists the official 2010 population of Pendleton as 16,745. Given its population above the 4,000 resident threshold, the City of Pendleton is required to provide receptacles, weekly collection service, or an education and promotion program to its residents. Individual residents are responsible for disposal of recyclable waste.

Airport hangar tenant leases do not currently stipulate tenant's individual responsibility for waste disposal and recycling for their hangars. Disposal of any non-standard recyclables (vehicle batteries, cell phones, rechargeable batteries, chargers, and other electronic waste) is similarly not currently designated as the responsibility of the individual tenants. These non-standard recyclables can and should be delivered to the appropriate recycle depot or transfer station.

Plan to Minimize Solid Waste Generation

Umatilla County can implement programs to reduce solid waste generation and earn "credits" toward recovery rates mandated by the state of Oregon. In 1997, House Bill 3456 created three programs that a wasteshed —in this case, Umatilla County can choose to implement:

- Waste Prevention Program
- Reuse Program
- Residential Composting Program

A two percent "credit" can be obtained for each program by creating an education or promotional campaign and adhering to at least two components listed by the Oregon Department of Environmental Quality (ODEQ). Credits of up to six percent can be deducted from the County's state mandated material recovery and waste generation rate if the County participates in all three programs – resulting in a two percent credit for each program implemented (six percent total). Umatilla County has not implemented any of these programs as yet. The County is required to maintain a 20 percent recovery rate as set forth in Oregon Chapter 459A – Reuse and Recycling, 2013 Edition. During the most recent year for which DEQ has compiled wasteshed recovery rates – 2013, Umatilla County achieved a calculated 28.6% waste recovery rate (2013 Oregon Material Recovery and Waste Generation Rates Report).

METHODS TO REDUCE SOLID WASTE

There are very limited opportunities to reduce solid waste generation because a limited amount of waste is produced at the Eastern Oregon Regional Airport. However, the airport should still establish a goal to reduce the amount of solid waste. While the airport is not responsible for waste generated by hangar tenants, informational brochures on recycling opportunities developed by Pendleton Sanitary Service could be distributed to all hangar tenants to encourage them to recycle their waste. Facility managers could make a note of the amount of waste generated each time waste is removed from their facility in order to track the amount of waste generated after implementing new policies.

Umatilla County has a relatively rural population with the City of Pendleton the second largest urbanized area in the county after Hermiston. Since the Airport is located within the City the current practice of contracting with Pendleton Sanitary Service is the most effective option. The City has established definitive steps to encourage and promote recycling (City of Pendleton SWMP 1993). Industrial and commercial sources generated 88 percent of the city's total waste at the time that study, which is the most recent, was completed. This waste included significant quantities of recyclables. Improvements called for in the 1993 study included increasing recovery of these recyclables through separation at the source and though processing of selected waste loads at the transfer station. Umatilla County's Solid Waste Management Plan was originally adopted in 1998 and updated in October, 2004. The plan identified a number of options to reduce solid waste, including:

- Require composting or mulching (at an approved site) in public contracts for lawn and landscape maintenance, if feasible and cost-effective
- Require recycling at County construction and demolition sites; support construction and demolition recycling "demonstration projects"
- Implement a County "buy recycled" policy
- Require or encourage space for recycling in new developments
- Establish a school education program
- Establish a business waste prevention education program/ demonstration projects
- Develop a home composting bin distribution and education
- Expand drop-off recycling opportunities
- Expand collection of recyclables from commercial waste generators
- Expand yard waste composting facilities
- Expand residential curbside recycling collection to other communities, more materials

Operational and Maintenance Requirements

Operational and maintenance requirements at the airport are minimal. The airport maintenance department is responsible for mowing the infield grass. A local farmer mows the outlying areas of the airfield. The infield lawn is not watered and the grass is typically mowed weekly during the spring growing season and then mowed on an "as needed" basis during the dry months. When the grass is mowed, the clippings are left in place, which typically provides approximately 25% of the total lawn fertilizer needs, creating a healthy turf environment (Starbuck 1999). While neither the City of Pendleton nor Umatilla

County Solid Waste Management Plans specifically promote programs that encourage "leaving grass clippings in place" they are currently left in place. Pendleton Sanitary Service does provide composting of yard waste.

Waste Management Contracts

A number of leases provided by the City of Pendleton were reviewed for information regarding waste and recycling. No hauling or landfill contracts are available.

The tenant's hangar leases do not stipulate responsibility for maintaining the grounds and premises in and around their rental areas. Similarly, no mention of the opportunity for recycling is included in the leases. Janitorial services are provided by an employee of the City of Pendleton. There is no contract for this service and no stipulation for recycling.

To promote additional recycling opportunities, language could be added to the tenant leases encouraging tenant(s) to use the transfer station or Recycle Depot. Each of these locations are within 2.5 miles or less from the airport. Tenants should also be asked to be conscientious of any waste generated in the hangars.

Potential for Cost Savings or Revenue Generation

The potential for cost savings is limited since, other than tenants in the terminal building, individual tenants are responsible for costs associated with solid waste disposal and recycling.

Revenue generation is limited due to the small amount of waste generated within the terminal building. The potential for additional revenue would primarily accrue to the individual tenants who contract with Pendleton Sanitary Service.

Future Development and Recommendations

FUTURE DEVELOPMENT

Future development projects at the airport include tenant improvements, landside and airside facility development, and rehabilitation projects. The demolition and waste associated with each of these projects would be the responsibility of the Contractor performing the work. It is assumed that the demolition waste would be taken to the Finley Butte Landfill in Boardman, Oregon.

A periodic review of the airport's solid waste plan needs to be implemented to allow for any unforeseen future development. For example, if glass recycling would become available and feasible for the airport, then the airport would need to reevaluate that option based on current practices.

RECOMMENDATIONS

Immediate

An immediate recommendation would be to continue with the existing practice of leaving lawn clippings in place, which preserves the aesthetics of the infield area while providing a natural source of fertilizer. The airport should also work with the City to promote recycling of waste materials by the janitorial staff.

Short-Term

A short-term recommendation would be to add a statement into tenant leases advising all tenants of their responsibility for removal of waste and the recycling options available at both the Pendleton Sanitary Service transfer station and Recycle Depot and to encourage tenants to recycle and minimize waste. Additionally, informational brochures on recycling opportunities developed by Pendleton Sanitary Services could be distributed to all the hangar tenants to encourage them to recycle their waste.

Ongoing

An ongoing recommendation would be to reevaluate the airport's solid waste plan, especially after development has occurred. Any increase in hangars may increase the amount of waste generated.

Modifications to Specifications

Language in construction contract documents could be added that encourages Contractors to recycle waste at the Pendleton Sanitary Services transfer station and to minimize waste caused by construction activities as much as practical.

References

City of Pendleton Solid Waste Management Plan (SWMP). December, 1993.

Umatilla County Solid Waste Management Plan (SWMP). October, 2004.

Umatilla County Solid Waste Ordinance (Solid Waste Ordinance) – Chapter 50. 2005.
Website: *www.co.umatilla.or.us/bcc/Codes/50.pdf*

Oregon Department of Environmental Quality (ODEQ). No date. "Waste Prevention and Reduction." Website: http://www.deq.state.or.us/lq/sw/twopercent/index.htm

Stewart, Erica. Airport Administration, Eastern Oregon Regional Airport & Economic Development Department. Phone Interview. 2 September 2015

Starbuck, Christopher J. Department of Horticulture. University of Missouri-Columbia. 1999. "Grass Clippings, Compost and Mulch: Questions and Answers." Website.
http://extension.missouri.edu/explorepdf/agguides/hort/g06958.pdf

Recycling Options

Recycling information - Pendleton Sanitary Service New Customer Letter and Brochure

Umatilla County Household Hazardous Waste Implementation Plan, October 17, 2001

Population

http://quickfacts.census.gov/cgi-bin/qfd/location

https://www.pdx.edu/prc/population-repor

Appendix A

LOC I-PDT	APP CRS	Rwy ldg	6301
110.3	**254°**	TDZE	**1487**
		Apt Elev	**1497**

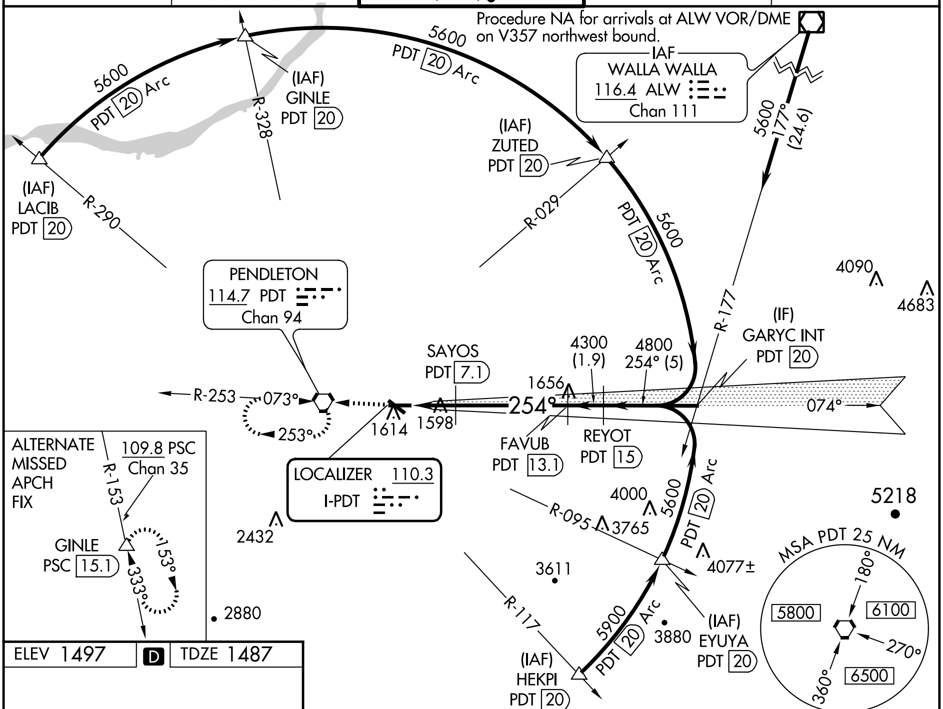
ILS or LOC/DME RWY 25
EASTERN OREGON RGNL AT PENDLETON (PDT)

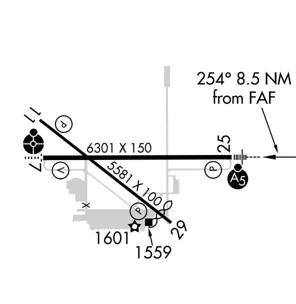
T DME from PDT VORTAC. Simultaneous reception of I-PDT and PDT DME required.
A When local altimeter setting not received, use Walla Walla altimeter setting and increase all DA/MDA 120 feet and S-LOC 25 Cat C/D visibility ¼ mile, Circling Cat C visibility ¼ mile and Circling Cat D visibility ½ mile. For inoperative MALSR when using Walla Walla altimeter setting increase S-ILS 25 visibility all Cats to 1 mile.
#RVR 1800 authorized with use of FD or AP or HUD to DA, NA when using Walla Walla altimeter setting.

MALSR A5

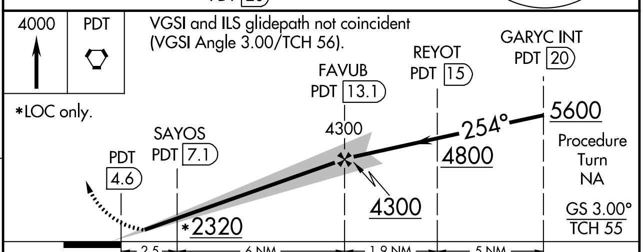
MISSED APPROACH: Climb to 4000 direct PDT VORTAC and hold, continue climb-in-hold to 4000.

ASOS	CHINOOK APP CON ★	PENDLETON TOWER ★	GND CON	UNICOM
118.325	**133.15 379.15**	**119.7** (CTAF) L **257.8**	**121.9 257.8**	**122.95**





REIL Rwys 11 and 29 L
MIRL Rwy 11-29 L
HIRL Rwy 7-25 L



CATEGORY	A	B	C	D
S-ILS 25	#1687/24 200 (200-½)			
S-LOC 25	1860/24 373 (400-½)		1860/35 373 (400-¾)	1860/40 373 (400-¾)
C CIRCLING	1920-1 423 (500-1)	1960-1 463 (500-1)	1980-1½ 483 (500-1½)	2200-2¼ 703 (800-2¼)

NW-1, 11 DEC 2014 to 08 JAN 2015

WAAS CH 73012 W07A	APP CRS 074°	Rwy ldg 6301 TDZE 1486 Apt Elev 1497

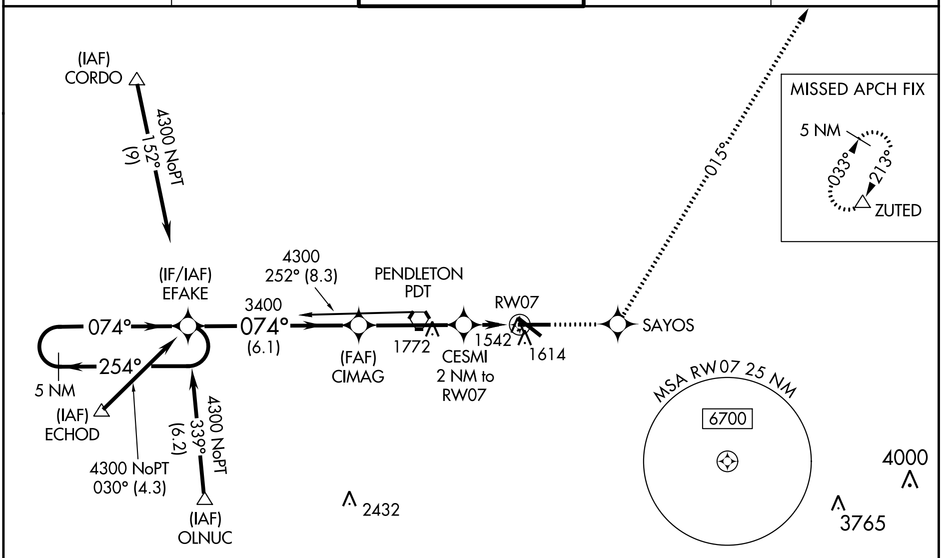
RNAV (GPS) RWY 7
EASTERN OREGON RGNL AT PENDLETON (PDT)

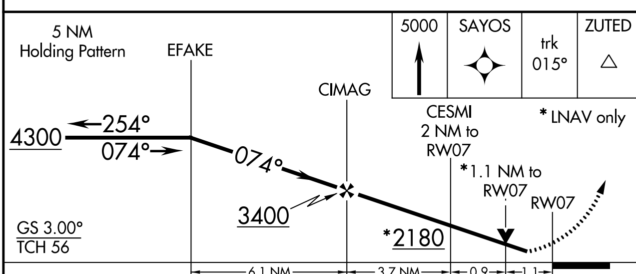
Inoperative table does not apply to LNAV/VNAV all Cats.
For uncompensated Baro-VNAV systems, LNAV/VNAV NA below -17°C (2°F) or above 46°C (114°F). DME/DME RNP-0.3 NA.
Visibility reduction by helicopters NA.
VDP and Baro-VNAV NA when using Walla Walla altimeter setting.
When local altimeter setting not received, use Walla Walla altimeter setting and increase all DA/MDA 120 feet, and all visibilities ¾ mile.
Inoperative table does not apply.

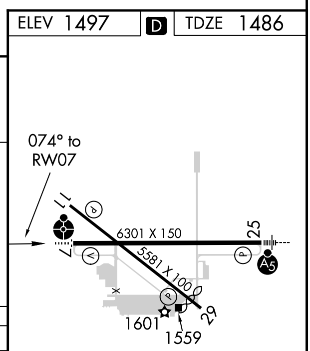
ODALS

MISSED APPROACH: Climb to 5000 direct SAYOS and via track 015° to ZUTED and hold.

ASOS	CHINOOK APP CON★	PENDLETON TOWER★	GND CON	UNICOM
118.325	133.15 379.15	119.7 (CTAF) L 257.8	121.9 257.8	122.95







CATEGORY	A	B	C	D
LPV DA	1736-¾ 250 (300-¾)			
LNAV/VNAV DA	1834-1¼ 348 (400-1¼)			
LNAV MDA	1880-¾ 394 (400-¾)			1880-1¼ 394 (400-1¼)
CIRCLING	1920-1 423 (500-1)	1960-1 463 (500-1)	1960-1½ 463 (500-1½)	2060-2 563 (600-2)

REIL Rwys 11 and 29 L
MIRL Rwy 11-29 L
HIRL Rwy 7-25 L

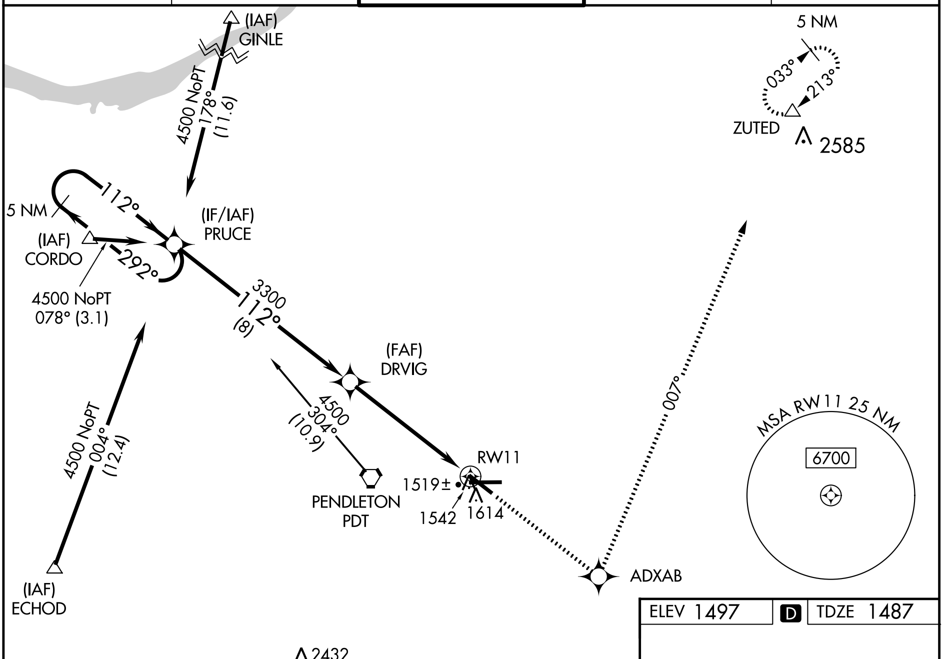
WAAS CH 82712 W11A	APP CRS 112°	Rwy ldg	
		TDZE	1487
		Apt Elev	1497

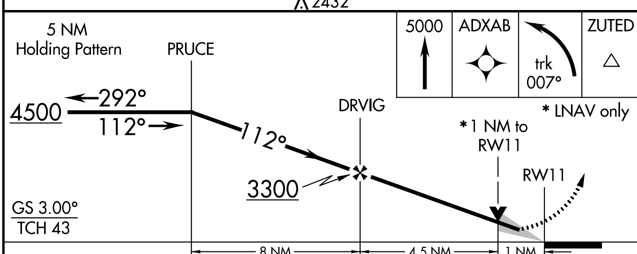
RNAV (GPS) RWY 11
EASTERN OREGON RGNL AT PENDLETON (PDT)

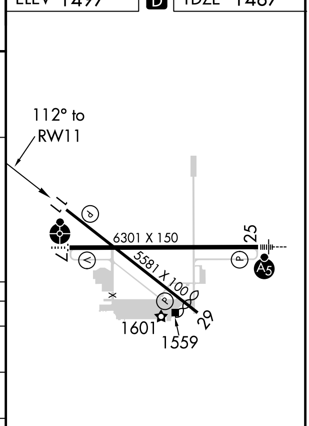
For uncompensated Baro-VNAV systems, LNAV/VNAV NA below -17°C (2°F) or above 46°C (114°F). DME/DME RNP-0.3 NA. When local altimeter setting not received, use Walla Walla altimeter setting: increase all DA/MDA 120 feet and visibility LPV all Cats ¼ mile, LNAV/VNAV all Cats ½ mile, LNAV Cats C and D ¼ mile and Circling Cat D ¼ mile. VDP and Baro-VNAV NA when using Walla Walla altimeter setting.

MISSED APPROACH: Climb to 5000 direct ADXAB and left turn via track 007° to ZUTED and hold.

ASOS	CHINOOK APP CON ★	PENDLETON TOWER ★	GND CON	UNICOM
118.325	133.15 379.15	119.7 (CTAF) L 257.8	121.9 257.8	122.95







CATEGORY	A	B	C	D
LPV DA	1737-1 250 (300-1)			
LNAV/VNAV DA	1850-1¼ 363 (400-1¼)			
LNAV MDA	1860-1 373 (400-1)			1860-1¼ 373 (400-1¼)
CIRCLING	1920-1 423 (500-1)	1960-1 463 (500-1)	1960-1½ 463 (500-1½)	2060-2 563 (600-2)

REIL Rwys 11 and 29 L
MIRL Rwy 11-29 L
HIRL Rwy 7-25 L

NW-1, 11 DEC 2014 to 08 JAN 2015

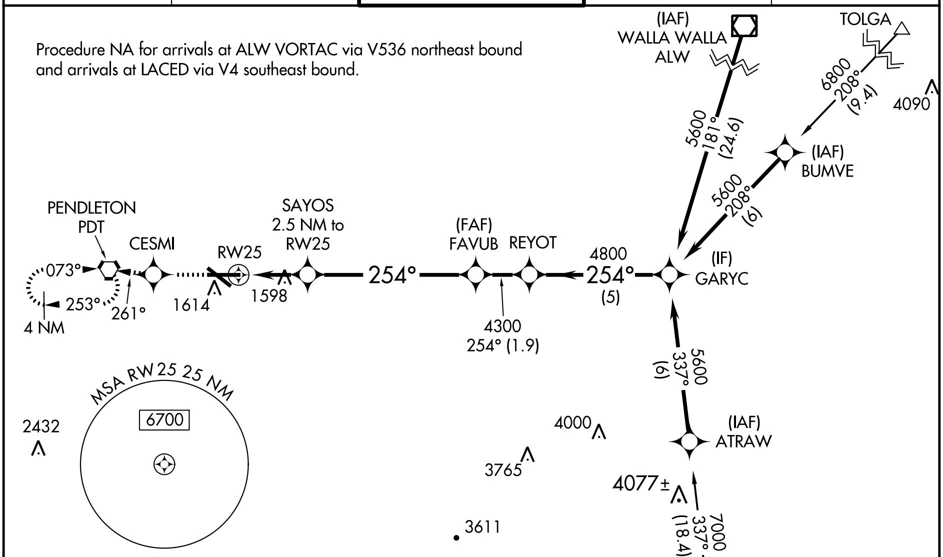
RNAV (GPS) RWY 25

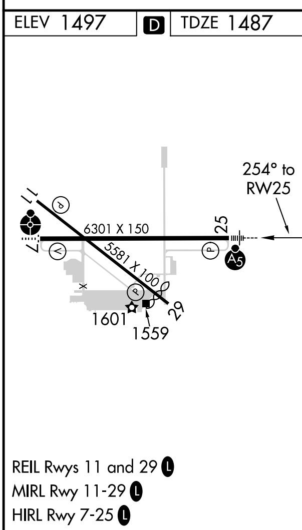
EASTERN OREGON RGNL AT PENDLETON (PDT)

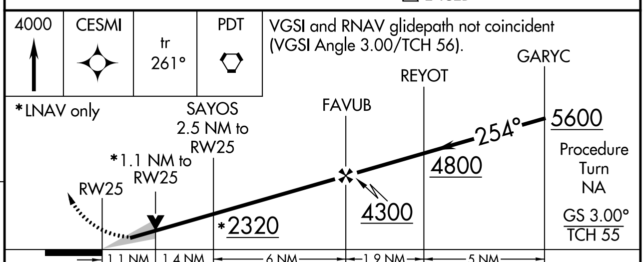
WAAS CH 78412 W25A	APP CRS 254°	Rwy ldg 6301 TDZE 1487 Apt Elev 1497

For inoperative MALSR, increase LNAV/VNAV Cat D visibility to RVR 5000, and LNAV Cat D to RVR 6000. For uncompensated Baro-VNAV systems, LNAV/VNAV NA below -17°C (2°F) or above 46°C (114°F). DME/DME RNP-0.3 NA. When local altimeter setting not received, use Walla Walla altimeter setting and increase all DA/MDA 120 feet, and all visibilities 1 mile; inoperative table does not apply. VDP and Baro-VNAV NA when using Walla Walla altimeter setting.	MALSR A5	MISSED APPROACH: Climb to 4000 direct CESMI and via track 261° to PDT VORTAC and hold, continue climb-in-hold to 4000.

ASOS	CHINOOK APP CON★	PENDLETON TOWER★	GND CON	UNICOM
118.325	133.15 379.15	119.7 (CTAF) L 257.8	121.9 257.8	122.95







CATEGORY	A	B	C	D
LPV DA	1687/24 200 (200-½)			
LNAV/VNAV DA	1800/24 313 (400-½)			1800/40 313 (400-¾)
LNAV MDA	1860/24 373 (400-½)			1860/50 373 (400-1)
CIRCLING	1920-1 423 (500-1)	1960-1 463 (500-1)	1960-1½ 463 (500-1½)	2060-2 563 (600-2)

NW-1, 11 DEC 2014 to 08 JAN 2015

NW-1, 11 DEC 2014 to 08 JAN 2015

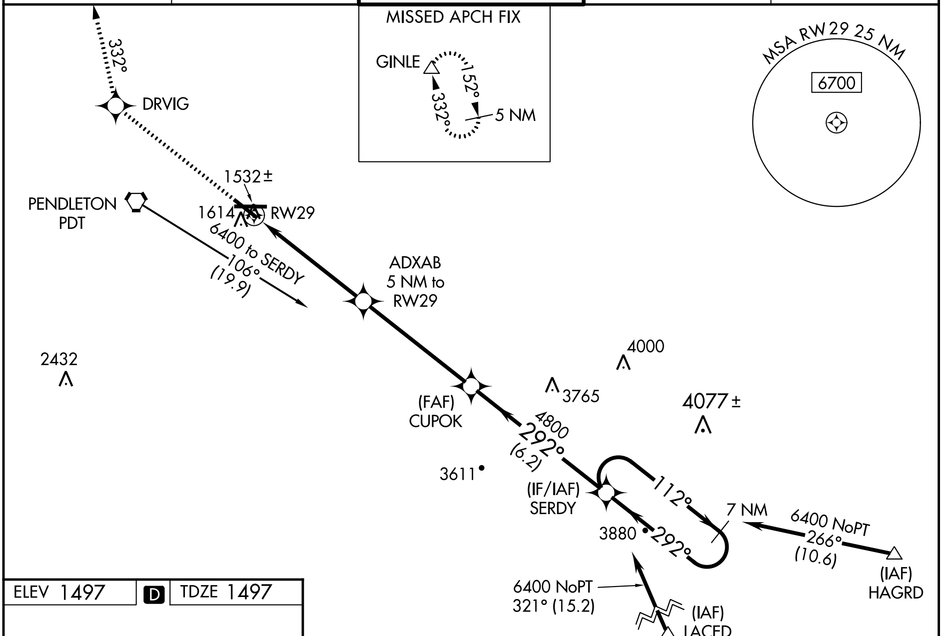
RNAV (GPS) RWY 29
EASTERN OREGON RGNL AT PENDLETON (PDT)

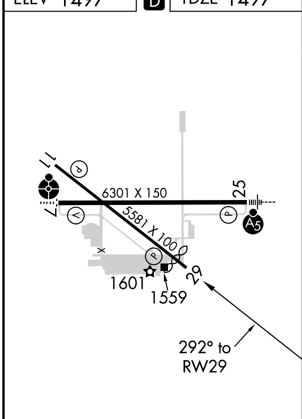
WAAS CH 42513 W29A	APP CRS 292°	Rwy ldg 5125 TDZE 1497 Apt Elev 1497

Inoperative table does not apply.
For uncompensated Baro-VNAV systems, LNAV/VNAV NA below -17°C (2°F) or above 46°C (114°F). DME/DME RNP-0.3 NA.
When local altimeter setting not received, use Walla Walla altimeter setting: increase all DA/MDA 120 feet and visibility LPV all Cats ¼ mile, LNAV/VNAV all Cats ½ mile, LNAV Cats C and D ¼ mile and Circling Cat D ¼ mile.
VDP and Baro-VNAV NA when using Walla Walla altimeter setting.

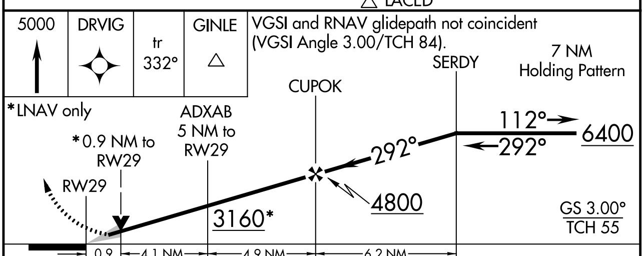
MISSED APPROACH: Climb to 5000 direct DRVIG and via track 332° to GINLE and hold.

ASOS	CHINOOK APP CON ★	PENDLETON TOWER ★	GND CON	UNICOM
118.325	133.15 379.15	119.7 (CTAF) L 257.8	121.9 257.8	122.95





REIL Rwys 11 and 29 L
MIRL Rwy 11-29 L
HIRL Rwy 7-25 L



CATEGORY	A	B	C	D
LPV DA	1747-1 250 (300-1)			
LNAV/VNAV DA	1801-1 304 (400-1)			
LNAV MDA	1860-1 363 (400-1)			1860-1¼ 363 (400-1¼)
CIRCLING	1920-1 423 (500-1)	1960-1 463 (500-1)	1960-1½ 463 (500-1½)	2060-2 563 (600-2)

VOR RWY 7

EASTERN OREGON RGNL AT PENDLETON (PDT)

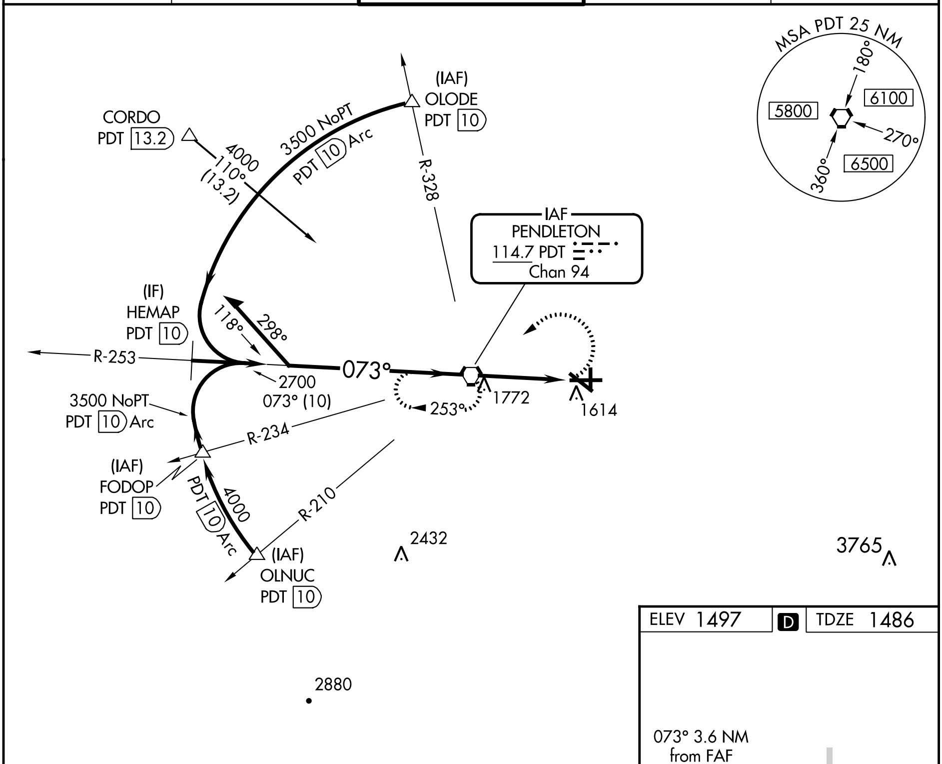
VORTAC PDT	APP CRS	Rwy ldg	6301
114.7	073°	TDZE	1486
Chan 94		Apt Elev	1497

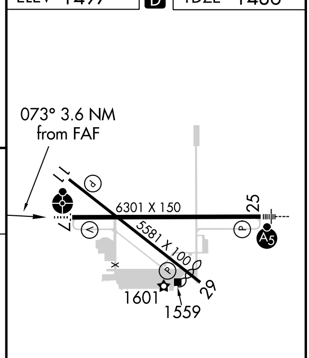
Inoperative table does not apply to S-7 Cat C.
Visibility reduction by helicopters NA.
When local altimeter setting not received, use Walla Walla altimeter setting and increase all MDA 120 feet, and all visibilities ½ mile.
Inoperative table does not apply when using Walla Walla altimeter setting.
VDP NA when using Walla Walla altimeter setting.

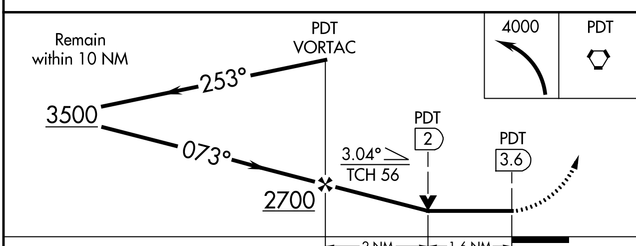
ODALS

MISSED APPROACH: Climbing left turn to 4000 direct PDT VORTAC and hold, continue climb-in-hold to 4000.

ASOS	CHINOOK APP CON★	PENDLETON TOWER★	GND CON	UNICOM
118.325	133.15 379.15	119.7 (CTAF) L 257.8	121.9 257.8	122.95







CATEGORY	A	B	C	D
S-7	2040-¾ 554 (600-¾)		2040-1½ 554 (600-1½)	2040-1¾ 554 (600-1¾)
CIRCLING	2040-1 543 (600-1)		2040-1½ 543 (600-1½)	2060-2 563 (600-2)

REIL Rwys 11 and 29 L
MIRL Rwy 11-29 L
HIRL Rwy 7-25 L

FAF to MAP 3.6 NM

Knots	60	90	120	150	180
Min:Sec	3:36	2:24	1:48	1:26	1:12

NW-1, 11 DEC 2014 to 08 JAN 2015

Appendix B

Eastern Oregon Regional Airport

Passenger Demand Analysis

Calendar Year 2014

Mead & Hunt

TABLE OF CONTENTS

INTRODUCTION

Air transportation and the airline industry are constantly in flux, with the change in the past decade even more pronounced. Through consolidation, fleet renewal and capacity discipline the airlines are making progress in their search for consistent profitability but challenges remain. Foremost among the challenges are the volatility of fuel prices and the variable strength of the global economy. The industry is dependent on long lead time resources such as facility and aircraft availability and a workforce whose rules inherently impact the ability for airlines to react quickly.

Capacity restraint is a keyword in the airline industry and leaves communities in the position of competing for scarce resources. Since the number of providers has become more limited through consolidation, in many cases there may be only one potentially viable service provider. With airlines primarily focused on major markets, smaller markets are generally in the position of having to being more aggressive to maintain/improve existing service or attain new service.

This places the responsibility on airports to monitor their market and be proactive with their ongoing air service development efforts, especially when performance issues are noted. When service improvements or new service is sought, it is important that airports and communities know and understand their market. The *Passenger Demand Analysis* is one aspect of knowing your market which provides objective air traveler data that is compiled from industry accepted sources using standard methodologies. Accordingly, airlines accept data included in the *Passenger Demand Analysis* as credible base information for air service forecasts. This report reviews scheduled commercial air service potential and does not include information on general aviation activity.

OBJECTIVES

The objective of the *Passenger Demand Analysis* is to develop information on the travel patterns of airline passengers who reside in the Eastern Oregon Regional Airport (PDT) catchment area. The report provides an understanding of the PDT situation and formulates strategies for improvement. This analysis includes:

- The originating airports used by air travelers
- Diversion of airline passenger traffic to competing airports
- An estimate of total airline passengers in the catchment area and related destinations
- Airlines used by local air travelers
- Average airfares by origin and destination airport
- Service levels at PDT and competing airports
- An assessment of the air service situation at PDT

METHODOLOGY

The *Passenger Demand Analysis* combines Airline Reporting Corporation (ARC) ticketed data and US Department of Transportation (DOT) airline data to provide a comprehensive overview of the air travel market. For the purposes of this study, ARC data includes tickets purchased through travel agencies in the PDT catchment area (**Exhibit 3.1**, page 5) as well as tickets purchased via online travel agencies by passengers in the PDT catchment area. It does not capture tickets issued directly by airline Web sites (e.g., www.aa.com, www.united.com) or directly through airline reservation offices. The data used include tickets for the zip codes in the catchment area, NOT all tickets. As a result, ARC data represents a sample to measure the air travel habits of catchment area air travelers.

Data for travel agencies located within the catchment area is reported by the zip code of the travel agency. Online travel agency data (e.g., Expedia, Orbitz and Travelocity) is reported by the customer zip code used to purchase the ticket. Although limitations exist, ARC data accurately portrays the airline ticket purchasing habits of a large cross-section of catchment area travelers, making the data useful to both airports and airlines.

A total of 20,286 ARC tickets for the 24-months ended December 31, 2014, were used in this analysis. Adjustments were made to account for Southwest Airlines at Portland International Airport (PDX) and Boise Airport (BOI) since they do not process tickets through ARC, and Allegiant Air at Pasco's Tri-Cities Airport (PSC).

EXECUTIVE SUMMARY

DATA SOURCE/CATCHMENT AREA

The *Passenger Demand Analysis* includes 20,286 ARC tickets from the PDT catchment area for the 24 months ended December 31, 2014. The catchment area has an estimated population of 125,166 in 2015 and 30 zip codes. In addition to ARC data, Diio Mi origin and destination data and schedule data is used throughout the report.

DEPARTURES AND AVAILABLE SEATS

SeaPort Airlines was the only airline that provided service to PDT during the calendar year 2014. There was a total of 1,141 annual departures on nine-seat turboprop aircraft.

SEAPORT AIRLINES COMPARISONS

PDT had 3,996 outbound passengers, representing SeaPort's 10th largest outbound passenger market. PDT had the 11th highest number of departures and seats of the 24 markets. PDT's load factor of 44 percent was 4 percentage points higher than SeaPort's average.

AIRPORT USE

Six percent of catchment area travelers used PDT, while 37 percent diverted to PSC, 26 percent to PDX, and 18 percent to BOI. Another 13 percent diverted to other airports that included Seattle/Tacoma, Walla Walla, Spokane and Redmond.

TRUE MARKET

PDT's total air service market, called the true market, is estimated at 133,365 annual origin and destination passengers. Domestic travelers accounted for 122,486 of the total true market (92 percent). International travelers made up the remaining 10,879 passengers (8 percent).

DESTINATIONS

Fifty-nine percent of travelers, or 79,021 passengers, were destined to or from one of the top 25 markets. Las Vegas was the number one destination with 8 percent of passengers. PDX was the second largest market, followed by Seattle, Denver and Phoenix Sky Harbor.

REGIONAL DISTRIBUTION OF TRAVEL

Thirty-five percent of travelers were traveling to the West region, a total of 46,661 travelers, almost double any other region. Nineteen percent traveled to the Northwest region and 10 percent to the Southeast region. Of the international travelers, the top three international regions were Mexico and Central America, Europe and Asia.

AIRLINES USED

With SeaPort providing the only service at PDT, they carried 100 percent of the passengers that utilized PDT in calendar year 2014. Diverting passengers to PSC, PDX, BOI and all other airports was estimated using an approximation of carrier share with ARC data. An adjustment was made for Southwest Airlines and Allegiant Air. Carrier shares of diverting PDT catchment area passengers were: Alaska Airlines 25 percent, United Airlines 23 percent, Delta Air Lines 19 percent, American Airlines/US Airways 11 percent, Southwest Airlines 10 percent, Allegiant Air 5 percent, Frontier Airlines 2 percent, and other various airlines 5 percent.

PASSENGER ACTIVITY

From 2005 through 2014, PDT domestic origin and destination passengers (as reported by airlines to the US DOT) decreased at a compounded annual growth rate (CAGR) of 12.0 percent compared to an increase at PSC of 1.2 percent, an increase at PDX of 5.1 percent, and an increase of 4.7 percent at BOI.

DOMESTIC AIRFARES

For calendar year 2014, the one-way average domestic airfare for PDT was $107, primarily due to the majority of passengers buying tickets only to PDX. The average fare for PSC during that same time was $213, $204 at PDX and $200 at BOI. In individual markets, there were major differences, especially between PSC and PDX/BOI.

AVERAGE FARE TREND

From 2005 through 2014, the average domestic airfare for PDT passengers remained relatively flat. Fares at PSC increased at a CAGR of 1.6 percent, while fares increased at PDX by 2.7 percent and BOI by 4.7 percent.

NONSTOP SERVICE

In calendar year 2014, PDT offered nonstop service to PDX with 1,141 annual departures. PSC offered service to nine of the top 25 true market destinations, on 5,607 annual departures. PDX offered the most options for diverting passengers, with nonstop service to 21 of the top 25 markets served on 51,453 annual departures, while BOI offered nonstop service to 14 of the top 25 destinations on 16,643 departures.

SITUATION ANALYSIS

Essential Air Service (EAS): PDT's current air service is supported by federal subsidies under the US DOT's EAS program. The current contract does not expire until the end of 2016; however, changes to the EAS program could affect the current subsidy for SeaPort service.

The US DOT announced in 2014 that they will begin enforcing the $200 per passenger subsidy cap rule for the year ending September 30, 2015. For any airport that is within 210 road miles of the nearest medium or large hub airport, they must maintain a maximum subsidy per passenger of $200. With an annual subsidy of $1,834,708, PDT will need to have a total of 9,174 annual passengers. For calendar year 2014, based on US DOT T-100 data, PDT had a per passenger subsidy of $229. It will be imperative that PDT increase passenger levels above 9,174 annual passengers before the US DOT enforces the subsidy cap.

In the future, the primary goal will be to secure a multi-year contract with an air carrier that will allow the airport to maximize enplanements. The goal of many EAS communities is to reach and maintain 10,000 enplanements, thereby allowing the community to have access to $1 million in annual Airport Improvement Program (AIP) funding, instead of just the $150,000 available to airports under that threshold. Unfortunately, unless a carrier with a larger seating capacity aircraft serves PDT, the airport will not likely attain this goal.

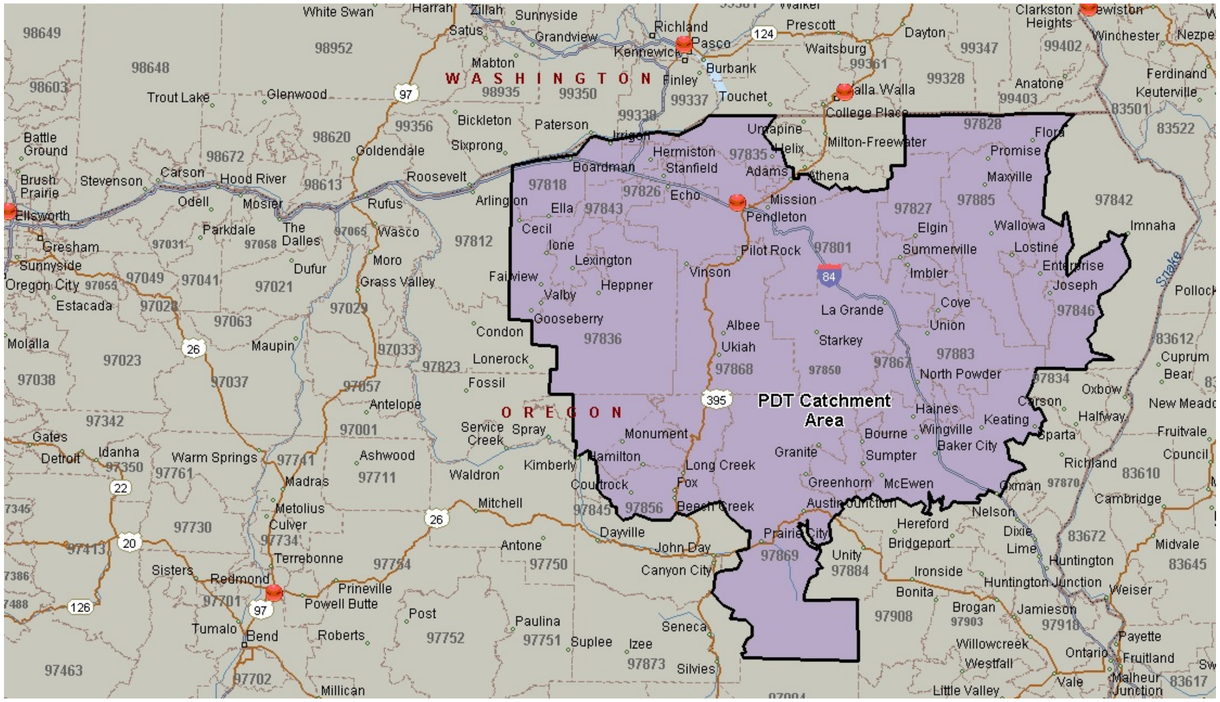
Recently, Peninsula Airways, operating as PenAir, was selected by the US DOT to provide EAS service from Crescent City, CA, to PDX. PenAir operates the 30-seat Saab 340 aircraft. PenAir is also a codeshare partner with Alaska Airlines, providing seamless connections to Alaska's nonstop markets at PDX. PenAir is expected to continue to grow their PDX operations and would possibly bid on the PDT contract when it becomes available.

Non-EAS Airline Discussion: Reductions of 50-seat regional jet aircraft in airline fleets, the lack of smaller turboprop aircraft and PDT market size limits opportunities for new airline service in the future. The most likely opportunity for improved PDT air service is PenAir service with their 30-seat turboprop aircraft, codesharing with Alaska at PDX.

EXISTING AIR SERVICE

To understand airport use, it is important to understand the relative size of the catchment area, current air service, and enplanement activity. PDT's use was determined using the 24-months ended December 31, 2014, ARC data for the zip codes from the catchment area.

EXHIBIT 3.1 PDT CATCHMENT AREA



AIRPORT CATCHMENT AREA

An airport catchment area, or service area, is a geographic area surrounding an airport where it can reasonably expect to draw passenger traffic and is representative of the local market. The catchment area contains the population of travelers who should use PDT considering the drive time from the catchment area to competing airports. This population of travelers is PDT's focus market for air service improvements and represents the majority of travelers using the local airport.

Exhibit 3.1 identifies the PDT catchment area. It is comprised of 30 zip codes within the US with an estimated population of 125,166 in 2015 (source: US Census Bureau, Woods & Poole Economics, Inc.).

AIR SERVICE

Catchment area airport use is affected by a variety of factors including: destinations offered, flight frequency, available seats, type of aircraft, airfares and distance to a competing airport. **Table 3.1** provides PDT's weekly departures and seats for calendar year 2014. SeaPort Airlines provided PDT service under the EAS program. SeaPort generally provided four daily roundtrips, except on the weekends.

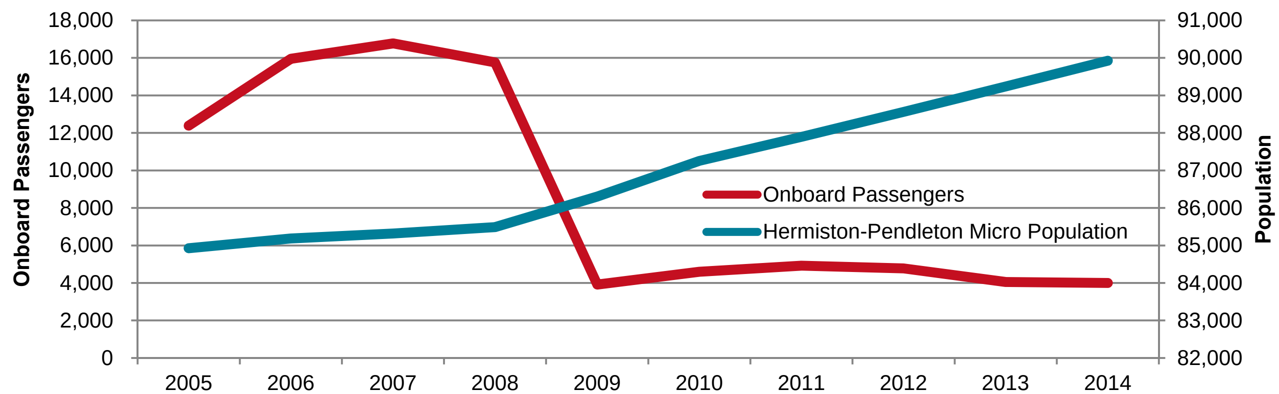
TABLE 3.1 CURRENT AIR SERVICE

DESTINATION AIRPORT	MARKETING CARRIER	ITEM	2014											
			JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Portland, OR	SeaPort	Dept	22	22	21	22	22	22	22	22	24	22	22	22
		Seats	220	220	210	198	198	198	198	198	216	198	198	198

ONBOARD PASSENGER AND POPULATION TRENDS

Exhibit 3.2 plots PDT's outbound passengers and population trends from 2005 to 2014. The Hermiston-Pendleton Micropolitan Statistical Area (Micro) was used as a surrogate for the growth trend of the PDT catchment area population. Over the 10-year period, the population grew from 84,927 to 89,924; increasing at a CAGR of 0.6 percent. At the same time, onboard passengers decreased from 12,385 in 2005 when Horizon Air operated at PDT to 3,996 in 2014, representing a compounded annual decrease of 11.8 percent. The drop in passengers occurred when SeaPort replaced Horizon's EAS service, decreasing seat capacity from the 37-seat de Havilland Dash 8-200 to the nine-seat Pilatus PC-12.

EXHIBIT 3.2 PASSENGERS AND POPULATION TREND



Source: Diio Mi; Woods & Poole Economics, Inc.

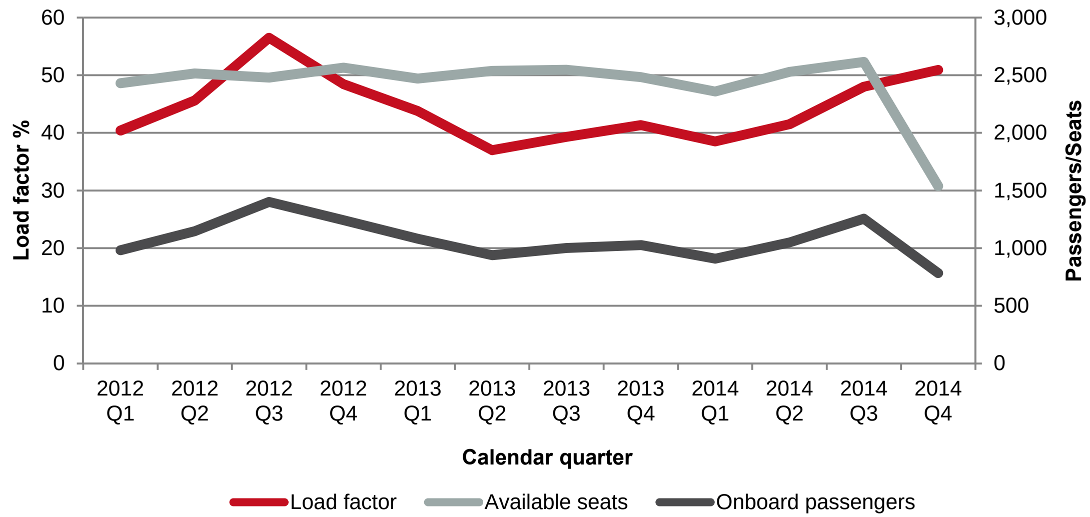
Positive Load Factor Trend
The improved load factor in the fourth quarter 2014 is likely in part related to the decrease in overall available seats compared to the same quarter in the prior year.

LOAD FACTOR, AVAILABLE SEATS, AND PASSENGERS

Exhibit 3.3 shows PDT's available seats, onboard passengers and load factors for arrivals and departures by quarter from first quarter 2012 through fourth quarter 2014. Over the 12-quarter period, load factors surpassed 50 percent only twice, in the third quarter 2012 and the fourth quarter 2014. The improved load factor in the fourth quarter 2014 is likely in part related to the decrease in overall available seats compared to the same quarter in the prior year. Overall, the load factor trend is positive.

Over the three-year period, available seats dropped to a low of 1,539 in the fourth quarter of 2014, representing the lowest available seats by quarter in the time period shown. Until the fourth quarter 2014, available seats had remained relatively stable. Coinciding with the reduction in seats, the low for onboard passengers at PDT through the three-year span was also in the fourth quarter of 2014 at 784. The high for onboard passengers was 1,401 in the third quarter of 2012.

EXHIBIT 3.3 LOAD FACTOR, AVAILABLE SEATS, AND ONBOARD PASSENGERS



SEAPORT AIRLINES COMPARISON

Table 3.2 provides a comparison of SeaPort's seats, departures and load factor by origin market for calendar year 2014. PDT had 3,996 outbound passengers, representing SeaPort's 10th largest outbound passenger market. PDT had the 11th highest number of departures and seats of the 24 markets. PDT's load factor of 44 percent was 4 percentage points higher than SeaPort's average.

TABLE 3.2 SEAPORT AIRLINES MARKET COMPARISON – CY 2014

RANK	DESTINATION	ONBOARDS	DEPARTURES	SEATS	LOAD FACTOR %
1	Juneau, AK	15,483	4,583	31,447	49
2	Portland, OR	8,314	1,859	16,736	49
3	Haines, AK	5,387	1,639	11,853	48
4	Hoonah, AK	5,070	1,528	10,605	48
5	Memphis, TN	4,929	1,713	15,413	36
6	Skagway, AK	4,731	1,402	10,494	48
7	Harrison, AR	4,330	961	8,649	50
8	North Bend, OR	4,318	855	7,695	56
9	Gustavus, AK	4,265	1,387	9,303	47
10	Pendleton, OR	3,996	1,005	9,041	44
11	El Dorado, AR	3,509	1,007	9,063	39
12	Kansas City, MO	3,284	1,093	9,828	35
13	Nashville, TN	2,971	925	8,325	38
14	Hot Springs, AR	2,473	760	6,840	35
15	El Centro/Imperial, CA	2,348	1,134	10,206	24
16	Dallas, TX (DAL)	2,083	524	4,716	44
17	Salina, KS	1,854	842	7,569	25
18	Jackson, TN	1,668	841	7,560	24
19	Burbank, CA	1,518	720	6,480	24
20	Athens, GA	1,433	358	3,222	44
21	San Diego, CA	1,324	718	6,462	20
22	Tupelo, MS	644	249	2,241	31
23	Great Bend, KS	153	252	2,273	8
24	Wichita, KS	38	135	1,215	3
All markets		**86,117**	**26,485**	**217,233**	**40**

TRUE MARKET

The true market portion of the *Passenger Demand Analysis* provides the total number of passengers in the catchment area; specifically, it analyzes the portion of passengers diverting from the PDT catchment area. This section investigates destinations associated with travel to and from the catchment area. In addition, destinations are grouped into geographic regions to further understand the regional flows of catchment area air travelers.

METHODOLOGY

The airport catchment area (**Exhibit 3.1,** page 5) represents the geographic area from which the airport primarily attracts air travelers. Domestic airlines report origin and destination traffic statistics to the US DOT on a quarterly basis. Used by itself, these traffic statistics do not quantify the total size of an air service market. By combining ARC tickets with passenger data contained in the US DOT airline reports, an estimate of the total air travel market by destination was calculated. The total air travel market is also referred to as the “true market”. Passengers are estimated for domestic and international markets on a destination basis. Adjustments were made to account for Allegiant and Southwest Airlines, which are unrepresented in ARC data.

The ARC data used in this report includes information on initiated passengers ticketed by local or online travel agencies. This enables the identification of passenger retention and diversion. According to US DOT airline reports for calendar year 2014, 49 percent of PDT origin and destination passengers initiated air travel from PDT, and the other 51 percent began their trip from another city (e.g. New York, Dallas, and Phoenix). For the purposes of this analysis, it is assumed that travel patterns for PDT visitors mirror catchment area passengers.

AIRPORT USE

Exhibit 4.1 shows the airports used by PDT catchment area travelers. An estimated six percent of the catchment area's air travelers used PDT for their trips; 37 percent diverted to PSC, 26 percent diverted to PDX, 18 percent to BOI, and 13 percent diverted to other airports. The other airports included Seattle/Tacoma International Airport, Walla Walla Regional Airport, Spoke International Airport and Redmond Municipal Airport.

DOMESTIC AND INTERNATIONAL ITINERARIES

Table 4.1 shows passengers by domestic and international itineraries. Seven percent, or 7,992 domestic travelers used PDT, while there were no reported international passengers that used PDT. PSC garnered the largest share of domestic catchment area passengers with 37 percent, while PDX obtained the largest share of international passengers from the catchment area with 42 percent.

EXHIBIT 4.1 AIRPORT USE

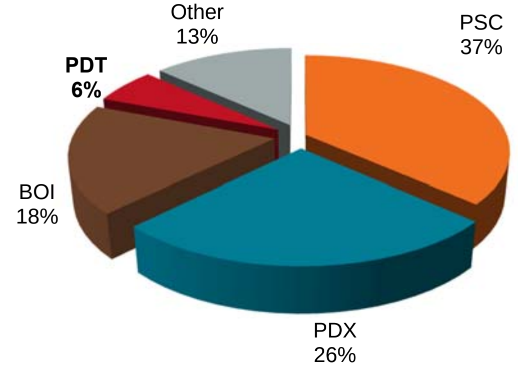


TABLE 4.1 AIRPORT USE - DOMESTIC & INTERNATIONAL COMPARISON

RANK	ORIGINATING AIRPORT	AIRPORT USE PAX	AIRPORT USE %
	Domestic		
1	PSC	45,770	37
2	PDX	30,267	25
3	BOI	22,024	18
5	**PDT**	**7,992**	**7**
4	OTHER	16,433	13
	Subtotal	**122,486**	**100**
	International		
1	PDX	4,579	42
2	PSC	2,932	27
3	BOI	2,205	20
4	**PDT**	**0**	**0**
5	OTHER	1,163	11
	Subtotal	**10,879**	**100**
	Domestic and international		
1	PSC	48,702	37
2	PDX	34,846	26
3	BOI	24,229	18
4	**PDT**	**7,992**	**6**
5	OTHER	17,596	13
	Total	**133,365**	**100**

The Pendleton community had the highest use of PDT
Not surprisingly, the Pendleton community had the highest percentage use of PDT, with 12 percent retention.

AIRPORT USE BY COMMUNITY

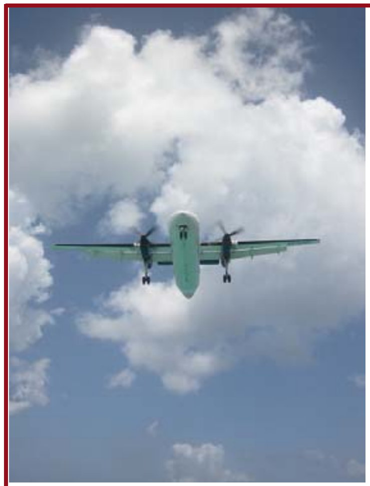
Airport retention rates by community are an important aspect to understanding the overall PDT catchment area. **Table 4.2** shows how retention varies among the local communities within it. ARC tickets include local travel agency data which is reported by the agency zip code and online travel agency data which is reported by the passenger zip code.

The Pendleton community generated the highest number of passengers, with 51,574 annual passengers; however, airport use by the Pendleton community was highest at PSC, with 38 percent use, while only 12 percent of passengers used PDT. The highest retention rates were from the Pendleton, Cove and Union communities, while there were many communities that did not utilize PDT at all.

TABLE 4.2 AIRPORT USE BY COMMUNITY

	% AIRPORT USE					TRUE MARKET ESTIMATE
	PSC	PDX	BOI	PDT	OTHER	
Pendleton	38	26	2	12	21	51,574
La Grande	12	31	43	3	11	25,893
Hermiston	62	26	1	4	7	18,403
Baker City	3	13	80	0	3	9,229
Enterprise	19	38	26	4	13	2,747
Umatilla	65	30	0	0	5	2,441
Joseph	8	35	25	2	29	2,106
Cove	9	38	40	7	7	1,920
Union	4	40	43	7	5	1,755
Boardman	45	46	5	0	5	1,646
All Other	38	31	18	1	12	15,651
Total	**37**	**26**	**18**	**6**	**13**	**133,365**

Note: Does not reflect the Allegiant or Southwest Airlines adjustment by community.



TOP 25 TRUE MARKET DESTINATIONS

The top 25 destinations for PDT (**Table 4.3**) accounted for 59 percent of the travel to/from the PDT catchment area. Las Vegas was the largest true market, with 10,421 annual passengers (14.3 passengers daily each way (PDEW)). PDX, PDT's only nonstop service, was the second largest true market with 9,199 annual passengers. Seattle, Denver and Phoenix Sky Harbor rounded out the top five markets.

TABLE 4.3 TRUE MARKET ESTIMATE - TOP 25 DESTINATIONS

RANK	DESTINATION	PDT REPORTED PAX	DIVERTED PAX	TRUE MARKET	PDEW
1	Las Vegas, NV	31	10,390	10,421	14.3
2	Portland, OR	7,415	1,784	9,199	12.6
3	Seattle, WA	39	6,646	6,684	9.2
4	Denver, CO	0	6,053	6,053	8.3
5	Phoenix, AZ (PHX)	9	5,027	5,037	6.9
6	Los Angeles, CA	45	4,479	4,524	6.2
7	Orange County, CA	11	3,728	3,738	5.1
8	San Diego, CA	21	2,874	2,895	4.0
9	San Francisco, CA	11	2,848	2,859	3.9
10	Phoenix, AZ (AZA)	0	2,491	2,491	3.4
11	Dallas, TX (DFW)	0	2,485	2,485	3.4
12	Washington, DC (DCA)	0	2,351	2,351	3.2
13	Honolulu, HI	21	2,198	2,219	3.0
14	Orlando, FL (MCO)	0	2,122	2,122	2.9
15	Chicago, IL (ORD)	0	1,740	1,740	2.4
16	Kahului, HI	18	1,663	1,681	2.3
17	Houston, TX (IAH)	0	1,580	1,580	2.2
18	Minneapolis, MN	20	1,542	1,562	2.1
19	Salt Lake City, UT	0	1,510	1,510	2.1
20	Guadalajara, Mexico	0	1,487	1,487	2.0
21	San Antonio, TX	0	1,376	1,376	1.9
22	Atlanta, GA	0	1,313	1,313	1.8
23	Sacramento, CA	40	1,230	1,270	1.7
24	Anchorage, AK	0	1,236	1,236	1.7
25	Boston, MA	0	1,185	1,185	1.6
Top 25 destinations		**7,682**	**71,339**	**79,021**	**108.2**
Total domestic		**7,992**	**114,494**	**122,486**	**167.8**
Total international		**0**	**10,879**	**10,879**	**14.9**
All markets		**7,992**	**125,373**	**133,365**	**182.7**

High Retention in Nonstop Market
PDX had a retention of 81 percent, significantly higher than average due to it being the only nonstop market from PDT.

ORIGINATING AIRPORT FOR THE TOP 25 DOMESTIC DESTINATIONS

Table 4.4 shows the percentage of passengers by market and originating airport. Ten percent of passengers used PDT for travel to the top 25 markets. With nonstop service, PDX was the only market with any significant retention for PDT catchment area travelers (81 percent).

TABLE 4.4 TOP 25 DOMESTIC DESTINATIONS BY ORIGINATING AIRPORT

RANK	DESTINATION	ORIGIN AIRPORT %					TOTAL PAX
		PSC	PDX	BOI	PDT	OTHER	
1	Las Vegas, NV	68	11	7	0	14	10,421
2	Portland, OR	19	0	0	81	0	9,199
3	Seattle, WA	73	0	0	1	27	6,684
4	Denver, CO	30	23	34	0	13	6,053
5	Phoenix, AZ (PHX)	34	16	29	0	21	5,037
6	Los Angeles, CA	33	34	11	1	21	4,524
7	Orange County, CA	45	32	4	0	18	3,738
8	San Diego, CA	19	42	19	1	20	2,895
9	San Francisco, CA	43	35	15	0	7	2,859
10	Phoenix, AZ (AZA)	100	0	0	0	0	2,491
11	Dallas, TX (DFW)	42	22	23	0	13	2,485
12	Washington, DC (DCA)	26	33	5	0	37	2,351
13	Honolulu, HI	11	53	19	1	16	2,219
14	Orlando, FL (MCO)	32	29	26	0	13	2,122
15	Chicago, IL (ORD)	33	34	22	0	11	1,740
16	Kahului, HI	11	67	13	1	9	1,681
17	Houston, TX (IAH)	33	35	20	0	12	1,580
18	Minneapolis, MN	47	8	32	1	11	1,562
19	Salt Lake City, UT	53	12	29	0	6	1,510
20	San Antonio, TX	52	18	21	0	9	1,487
21	Atlanta, GA	31	27	28	0	15	1,376
22	Sacramento, CA	24	33	29	3	11	1,313
23	Anchorage, AK	23	25	12	0	40	1,270
24	Boston, MA	23	42	28	0	6	1,236
25	Ontario, CA	52	22	13	1	12	1,185
	Top 25 domestic	**41**	**20**	**14**	**10**	**14**	**79,021**
	Total domestic	**37**	**25**	**18**	**7**	**13**	**122,486**

TOP 10 DOMESTIC DESTINATIONS BY ORIGINATING AIRPORT

Table 4.5 shows the top 10 markets when passengers exclusively fly out of PDT as well as the top 10 markets when passengers fly exclusively from PSC, PDX, BOI and the other diverting airports. While PSC is the top diverting airport, the largest diverting markets are markets with nonstop service from PSC, including two Allegiant markets in the top three: Las Vegas and Phoenix-Mesa.

TABLE 4.5 TOP 10 DOMESTIC DESTINATIONS BY ORIGINATING AIRPORT

	PSC		PDX		BOI	
RANK	DESTINATION	PAX	DESTINATION	PAX	DESTINATION	PAX
1	Las Vegas, NV	7,073	Los Angeles, CA	1,523	Denver, CO	2,052
2	Seattle, WA	4,849	Denver, CO	1,415	Phoenix, AZ (PHX)	1,459
3	Phoenix, AZ (AZA)	2,491	San Diego, CA	1,217	Las Vegas, NV	774
4	Denver, CO	1,790	Orange County, CA	1,204	Dallas, TX (DFW)	573
5	Portland, OR	1,784	Honolulu, HI	1,179	Orlando, FL (MCO)	548
6	Phoenix, AZ (PHX)	1,695	Las Vegas, NV	1,134	San Diego, CA	542
7	Orange County, CA	1,682	Kahului, HI	1,128	Los Angeles, CA	510
8	Los Angeles, CA	1,485	San Francisco, CA	988	Minneapolis, MN	503
9	San Francisco, CA	1,236	Phoenix, AZ (PHX)	822	Omaha, NE	497
10	Dallas, TX (DFW)	1,032	Kona, HI	790	Salt Lake City, UT	440

	PDT		OTHER	
RANK	DESTINATION	PAX	DESTINATION	PAX
1	Portland, OR	7,415	Seattle, WA	1,797
2	Medford, OR	123	Las Vegas, NV	1,408
3	San Jose, CA	85	Phoenix, AZ (PHX)	1,051
4	Los Angeles, CA	45	Los Angeles, CA	962
5	Sacramento, CA	40	Washington, DC (DCA)	860
6	Seattle, WA	39	Denver, CO	796
7	Las Vegas, NV	31	Orange County, CA	688
8	Honolulu, HI	21	San Diego, CA	567
9	San Diego, CA	21	Anchorage, AK	497
10	Minneapolis, MN	20	Juneau, AK	472

ORIGINATING AIRPORT FOR THE TOP 15 INTERNATIONAL DESTINATIONS

Table 4.6 shows the percentage of passengers for the top 15 international destinations by originating airport. Only the top 15 international destinations are shown due to the smaller market sizes involved with international itineraries and limited available data. Due to ticketing restrictions by the only carrier at PDT, there were no reported international passengers.

The top three international markets were: Guadalajara, Mexico; Cancun, Mexico; and Puerto Vallarta, Mexico. San Jose del Cabo, Mexico, and Mexico City, Mexico, completed the top five destinations.

TABLE 4.6 TOP 15 INTERNATIONAL DESTINATIONS BY ORIGINATING AIRPORT

RANK	DESTINATION	ORIGIN AIRPORT %					PASSENGERS	
		PDX	PSC	BOI	PDT	OTHER	TOTAL	PDEW
1	Guadalajara, Mexico	36	61	1	0	1	1,487	2.0
2	Cancun, Mexico	42	17	33	0	8	673	0.9
3	Puerto Vallarta, Mexico	65	20	12	0	2	656	0.9
4	San Jose del Cabo, Mexico	47	27	21	0	4	518	0.7
5	Mexico City, Mexico	21	74	3	0	2	422	0.6
6	Dublin, Ireland	23	28	47	0	3	254	0.3
7	London, UK (LHR)	34	19	34	0	13	248	0.3
8	San Jose, Costa Rica	44	7	34	0	15	190	0.3
9	Belize City, Belize	52	14	24	0	10	187	0.3
10	Vancouver, Canada	32	38	13	0	17	171	0.2
11	Edinburgh, UK	38	7	34	0	21	164	0.2
12	Roatan, Honduras	45	0	51	0	4	158	0.2
13	Paris-De Gaulle, France	48	23	9	0	20	142	0.2
14	Rome-Da Vinci, Italy	20	27	37	0	17	132	0.2
15	Manila, Philippines	25	38	13	0	25	129	0.2
Top 15 International		**40**	**35**	**18**	**0**	**6**	**5,528**	**7.6**
Total International		**42**	**27**	**20**	**0**	**11**	**10,879**	**14.9**

FEDERAL AVIATION ADMINISTRATION (FAA) GEOGRAPHIC REGIONS

It is important to identify and quantify air travel markets, but it is also important to measure air travel by specific geographic regions. Generally, airlines operate route systems that serve geographic areas. Additionally, most airline hubs are directional and flow passenger traffic to and from geographic regions, not just destinations within the region. Therefore, air service analysis exercises consider the regional flow of passenger traffic as well as passenger traffic to a specific city. Accordingly, this section analyzes the regional distribution of air travelers from the airport catchment area. For this exercise, the FAA geographic breakdown of the US is used (**Exhibit 4.2**).

EXHIBIT 4.2 FAA GEOGRAPHIC REGIONS

Significant Western Travel
The West region had the highest share of passengers from the PDT catchment area, representing 35 percent of all passengers.

REGIONAL DISTRIBUTION OF TRAVELERS

Table 4.7 divides catchment area travel into the FAA's nine geographic regions and one catch-all international region. The West region had the largest percentage of PDT catchment area passengers, representing 35 percent of all passengers. The Northwest region was the second largest region with 19 percent, following by the Southeast region with 10 percent. The International region was the fourth largest region with 8 percent. With service only to the Northwest region, it was the only region with any appreciable retention at PDT.

TABLE 4.7 REGIONAL DISTRIBUTION OF TRAVEL BY AIRPORT

AIRPORT		REGION										
		W	NW	SE	INTL	SW	GL	E	C	AK	NE	TOTAL
PSC	Pax	19,639	9,978	3,600	2,932	4,358	3,428	2,096	1,689	529	452	48,702
	%	40	20	7	6	9	7	4	3	1	1	100
PDX	Pax	13,368	2,147	4,753	4,579	2,689	1,854	3,211	1,121	484	637	34,846
	%	38	6	14	13	8	5	9	3	1	2	100
BOI	Pax	6,725	3,033	3,173	2,205	2,555	2,797	1,555	1,504	178	503	24,229
	%	28	13	13	9	11	12	6	6	1	2	100
PDT	Pax	333	7,607	0	0	0	32	0	0	20	0	7,992
	%	4	95	0	0	0	0	0	0	0	0	100
OTHER	Pax	6,595	2,893	1,440	1,163	1,128	943	1,542	414	1,351	127	17,596
	%	37	16	8	7	6	5	9	2	8	1	100
Total	**Pax**	**46,661**	**25,658**	**12,967**	**10,879**	**10,730**	**9,055**	**8,405**	**4,728**	**2,562**	**1,720**	**133,365**
	%	**35**	**19**	**10**	**8**	**8**	**7**	**6**	**4**	**2**	**1**	**100**
PDT Retention %		**1**	**30**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**6**

DISTRIBUTION OF INTERNATIONAL TRAVEL

Table 4.8 shows international travelers by airport and region. Eight percent of catchment area travelers had international itineraries. Mexico and Central America was the most frequented international region with 49 percent, or 5,377 of the total 10,879 catchment area international travelers, followed by Europe with 23 percent of the total. Asia was the third largest international region with 8 percent, and Canada was the fourth largest region with 5 percent of international travel. The remaining top international regions were, in order of greatest to least: the Caribbean, South America, Australia and Oceania, Africa and the Middle East.

TABLE 4.8 REGIONAL DISTRIBUTION OF INTERNATIONAL PASSENGERS

REGION	ORIGINATING AIRPORT					TRUE MARKET	% OF COLUMN
	PDX	PSC	BOI	PDT	OTHER		
Mexico & Central America	2,375	1,831	911	0	261	5,377	49
Europe	876	464	779	0	391	2,510	23
Asia	315	241	135	0	200	891	8
Canada	206	142	142	0	90	579	5
Caribbean	360	29	80	0	45	515	5
South America	171	84	71	0	3	328	3
Australia & Oceania	138	80	26	0	68	312	3
Africa	135	39	51	0	84	309	3
Middle East	3	23	10	0	23	58	1
Total passengers	**4,579**	**2,932**	**2,205**	**0**	**1,163**	**10,879**	**100**
% of row	**42**	**27**	**20**	**0**	**11**	**100**	**-**
% of column	**100**	**100**	**100**	**0**	**100**	**100**	**-**

AIRLINES

Information in this section identifies airline use by catchment area air travelers. The information is airport and airline specific. The intent is to determine which airlines are used to travel to specific destinations. The airline market share at PDT is based on US DOT airline reported data. Airline market share at competing airports is based on ARC data and is an estimation of the carrier's share of diverted passengers. With the only service at PDT provided by SeaPort Airlines, 100 percent of all passengers flew on SeaPort from PDT, and a separate table is not provided.

AIRLINES USED AT PSC

Table 5.1 shows the airlines used when travelers from the catchment area used PSC. Alaska Airlines had the largest share of catchment area passengers at PSC carrying 27 percent of diverting passengers. United Airlines was the second largest carrier for diverting passengers at PSC with 26 percent, followed by Delta Air Lines with 25 percent and Allegiant Air with 15 percent. The combined American Airlines/US Airways, mainly through codeshare relationships with Alaska, obtained 6 percent of passengers and all other carriers combined for two percent of passengers.

TABLE 5.1 AIRLINES USED AT PSC

		AIRLINE %						
RANK	TOP 25 TRUE MARKETS	AS	UA	DL	G4	AA/US	OTHER	TOTAL PSC PAX
1	Las Vegas, NV	14	4	13	68	0	0	7,073
2	Seattle, WA	84	6	1	0	6	2	4,849
3	Phoenix, AZ (AZA)	0	0	0	100	0	0	2,491
4	Denver, CO	5	77	5	0	8	4	1,790
5	Portland, OR	82	7	2	0	9	1	1,784
6	Phoenix, AZ (PHX)	34	13	41	0	12	0	1,695
7	Orange County, CA	47	39	14	0	0	0	1,682
8	Los Angeles, CA	58	27	11	0	0	3	1,485
9	San Francisco, CA	17	77	2	0	3	2	1,236
10	Dallas, TX (DFW)	19	22	48	0	12	0	1,032
11	Salt Lake City, UT	9	1	90	0	0	1	796
12	Minneapolis, MN	10	8	78	0	2	3	739
13	San Antonio, TX	5	39	52	0	4	0	714
14	Orlando, FL (MCO)	2	34	47	0	14	3	688
15	Ontario, CA	44	25	31	0	0	0	618
16	Washington, DC (DCA)	3	12	83	0	2	0	605
17	Chicago, IL (ORD)	14	36	32	0	18	0	580
18	San Diego, CA	55	16	29	0	0	0	548
19	Houston, TX (IAH)	2	76	21	0	0	1	522
20	St. Louis, MO	3	44	46	0	3	5	497
21	Atlanta, GA	10	44	47	0	0	0	401
22	Omaha, NE	0	53	43	0	3	0	395
23	Oklahoma City, OK	7	64	29	0	0	0	363
24	Kansas City, MO	2	61	29	0	6	2	338
25	Reno, NV	45	19	36	0	0	0	338
	Total top 25	**31**	**21**	**20**	**22**	**4**	**1**	**33,262**
	Total all markets	**27**	**26**	**25**	**15**	**6**	**2**	**48,702**

AIRLINES USED AT PDX

Table 5.2 shows the airlines used when travelers from the catchment area used PDX. Alaska had the largest share of catchment area passengers at PDX carrying 23 percent of diverting passengers. Southwest Airlines had the second highest share of traffic with 22 percent, followed by United with 16 percent, American/US Airways with 14 percent and Delta with 11 percent. All other airlines combined for 13 percent of passengers.

TABLE 5.2 AIRLINES USED AT PDX

RANK	TOP 25 TRUE MARKETS	AIRLINE %						TOTAL PDX PAX
		AS	WN	UA	AA/US	DL	OTHER	
1	Los Angeles, CA	55	14	5	4	16	7	1,523
2	Denver, CO	1	35	14	3	1	47	1,415
3	San Diego, CA	59	32	0	6	2	1	1,217
4	Orange County, CA	57	21	8	14	0	0	1,204
5	Honolulu, HI	48	0	7	0	3	42	1,179
6	Las Vegas, NV	47	40	6	5	2	1	1,134
7	Kahului, HI	70	0	19	0	0	11	1,128
8	San Francisco, CA	40	0	29	5	6	19	988
9	Phoenix, AZ (PHX)	7	40	2	51	0	0	822
10	Kona, HI	47	0	17	0	11	25	790
11	Washington, DC (DCA)	46	2	15	8	25	4	765
12	Long Beach, CA	25	0	0	8	2	65	720
13	Orlando, FL (MCO)	0	20	41	20	17	2	612
14	Chicago, IL (ORD)	38	0	46	15	1	0	593
15	Dallas, TX (DFW)	19	0	2	58	8	12	554
16	Houston, TX (IAH)	1	0	67	23	2	6	548
17	Boston, MA	36	3	20	11	5	25	503
18	New York, NY (JFK)	4	0	3	19	65	9	491
19	Miami, FL	1	0	38	54	7	0	452
20	Fort Lauderdale, FL	6	10	32	29	17	6	433
21	Sacramento, CA	29	69	0	0	1	0	421
22	Lihue, HI	25	0	31	3	8	33	408
23	Atlanta, GA	15	8	8	17	50	2	350
24	Pensacola, FL	26	8	32	22	12	0	344
25	New Orleans, LA	2	22	20	26	6	24	325
	Total top 25	**34**	**14**	**16**	**13**	**8**	**15**	**18,918**
	Total all markets	**23**	**22**	**16**	**14**	**11**	**13**	**34,846**

United the Dominant Carrier at BOI
United had the largest share of catchment area passengers at BOI carrying 31 percent of diverting passengers.

AIRLINES USED AT BOI

Table 5.3 shows the airlines used when travelers from the catchment area used BOI. United had the largest share of catchment area passengers at BOI carrying 31 percent of diverting passengers. Southwest Airlines had the second highest share of traffic with 28 percent, followed by Delta with 21 percent, American/US Airways with 13 percent and Alaska with 6 percent. All other airlines combined for 2 percent of passengers.

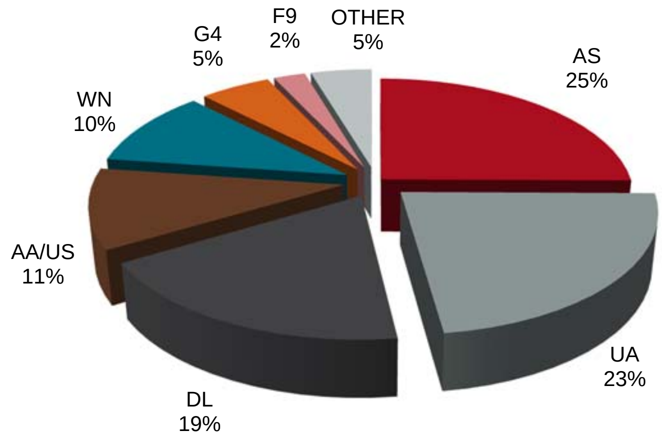
TABLE 5.3 AIRLINES USED AT BOI

RANK	TOP 25 TRUE MARKETS	AIRLINE %						TOTAL BOI PAX
		UA	WN	DL	AA/US	AS	OTHER	
1	Denver, CO	50	41	3	5	1	0	2,052
2	Phoenix, AZ (PHX)	3	42	6	49	0	0	1,459
3	Las Vegas, NV	5	61	26	3	5	0	774
4	Dallas, TX (DFW)	31	0	33	34	1	0	573
5	Orlando, FL (MCO)	29	33	29	8	1	0	548
6	San Diego, CA	12	36	11	10	31	1	542
7	Los Angeles, CA	40	37	7	11	4	0	510
8	Minneapolis, MN	9	11	63	16	0	0	503
9	Omaha, NE	40	35	23	1	0	1	497
10	Salt Lake City, UT	3	0	81	7	7	1	440
11	San Francisco, CA	92	2	0	1	3	1	433
12	Honolulu, HI	20	0	12	0	48	20	414
13	Chicago, IL (ORD)	62	0	18	17	3	0	382
14	Atlanta, GA	27	23	43	7	0	0	370
15	Sacramento, CA	5	8	3	3	80	0	363
16	Boston, MA	40	23	26	2	3	5	331
17	Indianapolis, IN	15	28	57	0	0	0	331
18	Houston, TX (IAH)	29	0	35	35	0	0	319
19	San Jose, CA	0	6	4	0	90	0	293
20	San Antonio, TX	18	45	26	7	4	0	293
21	Fort Lauderdale, FL	20	37	30	13	0	0	268
22	New Orleans, LA	49	37	5	3	3	3	261
23	Kansas City, MO	27	45	22	6	0	0	255
24	Santa Barbara, CA	94	0	0	6	0	0	223
25	Springfield, MO	88	0	0	12	0	0	217
	Total top 25	**30**	**28**	**20**	**13**	**9**	**1**	**12,651**
	Total all markets	**31**	**28**	**21**	**13**	**6**	**2**	**24,229**

AIRLINES USED AT DIVERTING AIRPORTS

Exhibit 5.1 displays the combined market share of airlines serving the PDT catchment area diverting passengers. Alaska had the highest share with 25 percent, followed by United with 23 percent, Delta with 19 percent, American/US Airways with 11 percent, Southwest with 10 percent, Allegiant 5 percent, Frontier Airlines 2 percent and all other carriers with 5 percent.

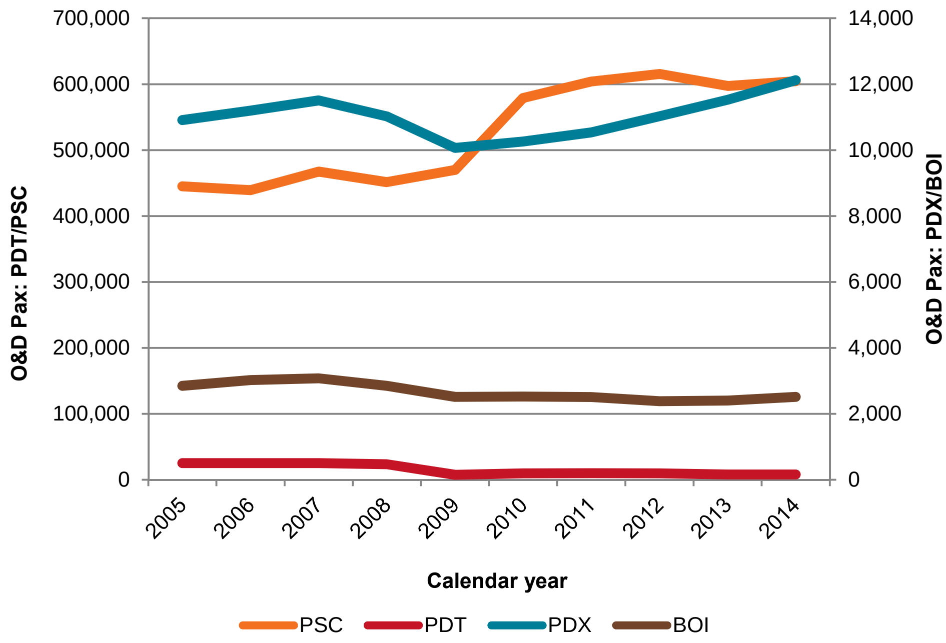
EXHIBIT 5.1 AIRLINE MARKET SHARE OF DIVERTING PASSENGERS



FACTORS AFFECTING AIR SERVICE DEMAND AND RETENTION

This section examines several factors that have affected and will continue to affect air service demand in the Pendleton area and PDT's ability to retain passengers. The factors affecting PDT's ability to retain passengers included in this section are: airfares, travel time from competing airports compared to PDT, nonstop service availability, and the quality and capacity of air service offered at PDT and competing airports.

EXHIBIT 6.1 DOMESTIC PASSENGER TRENDS



PASSENGER ACTIVITY COMPARISON

To better understand the changes in passenger volumes at PDT, PSC, PDX and BOI, **Exhibit 6.1** provides a depiction of domestic origin and destination passengers over the last 10 years by yearly passenger totals as reported to the US DOT. During this period, PDT's origin and destination passengers decreased at a CAGR of 12.0 percent. Conversely, traffic at PSC, PDX and BOI have increased at a CAGR of 1.2 percent, 5.1 percent and 4.7 percent, respectively.

AIRFARES

When a traveler decides which airport to access for travel, airfares play a large role. Airfares affect air service demand and an airport's ability to retain passengers. One-way airfares (excluding taxes and Passenger Facility Charges (PFC)) paid by travelers are used to measure the relative fare competitiveness between PDT, PSC, PDX and BOI.

Table 6.1 shows one-way average airfares for the top 25 catchment area domestic destinations. Average airfares are a result of many factors including: length of haul, availability of seats, business versus leisure fares and airline competition. Due to the way that tickets are issued and virtually no connectivity beyond, the average fares comparisons are difficult to make for PDT. The average fares are a better comparison for diverting traffic and which airport was chosen instead of PDT.

TABLE 6.1 U.S. DOT AVERAGE DOMESTIC ONE-WAY FARES

RANK	DESTINATION	AVERAGE ONE-WAY FARE				PDT MAX DIFF.
		PSC	PDX	BOI	PDT	
1	Las Vegas, NV	$92	$112	$107	$170	$79
2	Portland, OR	$102	-	$103	$99	($3)
3	Seattle, WA	$101	$106	$110	$180	$79
4	Denver, CO	$240	$134	$155	-	N/A
5	Phoenix, AZ (PHX)	$154	$144	$146	$482	$338
6	Los Angeles, CA	$119	$142	$148	$252	$133
7	Orange County, CA	$141	$139	$166	$208	$69
8	San Diego, CA	$177	$108	$121	$144	$36
9	San Francisco, CA	$149	$115	$199	$177	$62
10	Phoenix, AZ (AZA)	$75	-	-	-	N/A
11	Dallas, TX (DFW)	$244	$195	$234	-	N/A
12	Washington, DC (DCA)	$339	$239	$287	-	N/A
13	Honolulu, HI	$286	$237	$267	$308	$70
14	Orlando, FL (MCO)	$256	$213	$212	-	N/A
15	Chicago, IL (ORD)	$298	$222	$299	-	N/A
16	Kahului, HI	$339	$271	$314	$434	$163
17	Houston, TX (IAH)	$270	$235	$248	-	N/A
18	Minneapolis, MN	$257	$224	$238	$201	($23)
19	Salt Lake City, UT	$218	$134	$153	-	N/A
20	San Antonio, TX	$221	$191	$204	-	N/A
21	Atlanta, GA	$326	$243	$255	-	N/A
22	Sacramento, CA	$184	$108	$132	$147	$39
23	Anchorage, AK	$257	$231	$249	-	N/A
24	Boston, MA	$279	$229	$271	-	N/A
25	Ontario, CA	$149	$129	$168	$136	$7
Average domestic fare		**$213**	**$204**	**$200**	**$107**	**($93)**

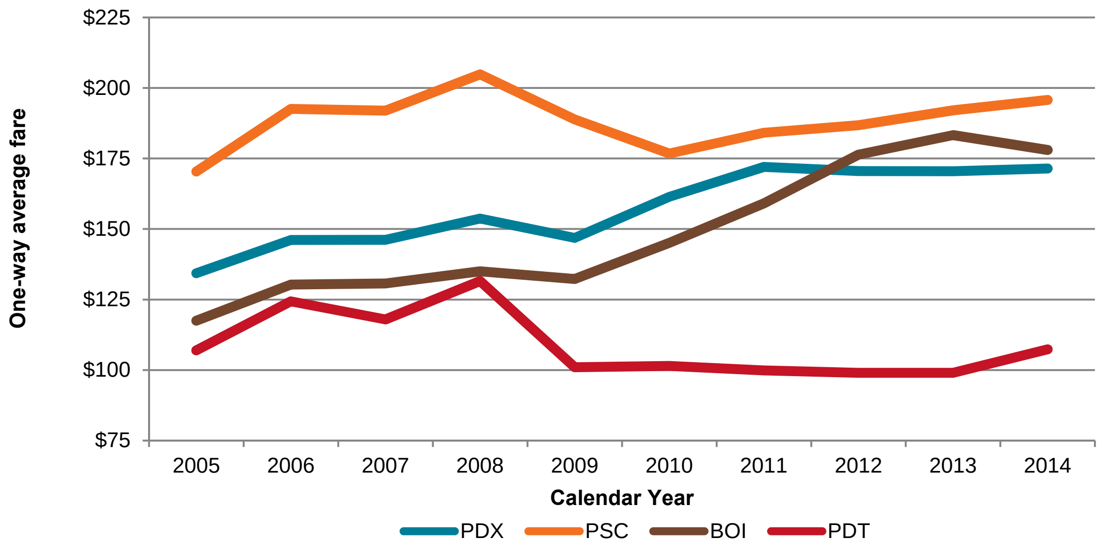
Source: Diio Mi; Note: CY 2014; Fares do not include taxes or Passenger Facility Charges

Exhibit 6.2 tracks the average fares at PDT, PSC, PDX and BOI from 2005 through 2014. Based on US DOT airline data from 2005 through 2014:

- Average fares at PDT have ranged from $99 (2013) to $132 (2008).
- The average fare at PSC ranged from $170 (2005) to $205 (2008).
- The average fare at PDX ranged from $134 (2005) to $172 (2011).
- The average fare at BOI ranged from $118 (2005) to $183 (2013).

Overall, average domestic fares over the 10-year period increased at a CAGR of 1.6 percent at PSC, 2.7 percent at PDX, 4.7 percent at BOI, while remaining relatively flat at PDT.

EXHIBIT 6.2 10-YEAR AVERAGE DOMESTIC ONE-WAY FARE TREND



TRAVEL TIME COMPARISON

Table 6.2 displays the overall flight time from PDT to the top 10 catchment area destinations that do not have nonstop service and require a connection. A comparison of the travel time from PDT with the amount of time it takes to drive to PSC, PDX or BOI and use nonstop service is also provided.

Accessible interline connecting flights from PDT require a minimum connecting time allowance of 45 minutes to be included in the comparison. The drive time from the Pendleton community to PSC is estimated at 1 hour and 10 minutes; to PDX is estimated at 3 hours and 30 minutes; and to BOI is estimated at 3 hours and 48 minutes.

A PDT catchment area air traveler can save overall travel time in addition to the convenience of using the local airport in five of the top 10 PDT catchment area markets without nonstop service from PDT.

TABLE 6.2 TRAVEL TIME COMPARISON (MINUTES)

RANK	CONNECTING DESTINATIONS	PDT CONNECT	PSC NONSTOP	PDX NONSTOP	BOI NONSTOP	TIME SAVINGS
1	Las Vegas, NV	255	202	336	328	(53)
2	Seattle, WA	185	119	255	318	(66)
3	Denver, CO	275	205	355	332	(70)
4	Phoenix, AZ (PHX)	315	-	363	347	32
5	Los Angeles, CA	273	-	348	353	75
6	Orange County, CA	335	-	351	-	16
7	San Diego, CA	308	-	350	353	42
8	San Francisco, CA	238	193	315	334	(45)
9	Phoenix, AZ (AZA)	-	221	-	-	-
10	Dallas, TX (DFW)	380	-	435	-	55

Source: Diio Mi; Peak Day/Month - July 10 2014. PDT Connections are interline only.

Nonstop Service to One of the Top 25 Destinations
PDT offered nonstop service to one of the top 25 catchment area destinations with 1,141 departures in calendar year 2014.

NONSTOP SERVICE AVAILABILITY

Travelers drive to competing airports to access air service for many reasons, one of which is nonstop service availability. **Table 6.3** compares the level of air service offered at PDT with that offered at PSC, PDX and BOI.

In calendar year 2014, PDT offered nonstop service to one of the top 25 catchment area destinations with 1,141 departures. PSC had service to nine of the top 25 markets with over 5,600 departures in 2014. PDX offered nonstop service to 21 of the top 25 markets on 51,453 departures, while BOI offered service to 14 of the top markets with 16,643 annual departures.

TABLE 6.3 NONSTOP SERVICE COMPARISON

RANK	DESTINATION	TOTAL DEPARTURES			
		PSC	PDX	BOI	PDT
1	Las Vegas, NV	163	2,847	815	0
2	Portland, OR	365	0	2,356	1,141
3	Seattle, WA	1,751	10,222	2,887	0
4	Denver, CO	1,002	3,938	2,383	0
5	Phoenix, AZ (PHX)	0	3,570	1,185	0
6	Los Angeles, CA	28	4,001	932	0
7	Orange County, CA	0	1,023	0	0
8	San Diego, CA	0	1,915	365	0
9	San Francisco, CA	502	5,599	1,774	0
10	Phoenix, AZ (AZA)	99	0	0	0
11	Dallas, TX (DFW)	0	2,008	0	0
12	Washington, DC (DCA)	0	365	0	0
13	Honolulu, HI	0	731	13	0
14	Orlando, FL (MCO)	0	0	0	0
15	Chicago, IL (ORD)	0	2,665	684	0
16	Kahului, HI	0	605	0	0
17	Houston, TX (IAH)	0	998	134	0
18	Minneapolis, MN	429	1,362	859	0
19	Salt Lake City, UT	1,268	2,465	1,892	0
20	San Antonio, TX	0	0	0	0
21	Atlanta, GA	0	1,559	0	0
22	Sacramento, CA	0	3,151	364	0
23	Anchorage, AK	0	1,000	0	0
24	Boston, MA	0	504	0	0
25	Ontario, CA	0	925	0	0
Total top 25 frequencies		**5,607**	**51,453**	**16,643**	**1,141**
Number of top 25 served		**9**	**21**	**14**	**1**
Total destinations served		**19**	**1**	**61**	**1**

Source: Diio Mi; CY 2014

QUALITY OF AIR SERVICE AT COMPETING AIRPORTS

The quality of air service offered by an airport is a factor in a traveler's decision when selecting where to originate or terminate air service. In general, passengers prefer larger aircraft over smaller aircraft and jet aircraft over turboprop aircraft. For the purposes of this section, quality of air service is measured by size of aircraft and jets versus turboprops.

Table 6.4 provides total departures by aircraft type for calendar year 2014 for PSC, PDX, BOI and PDT. PDT offered a total of 1,141 departures and 10,540 seats, all on small turboprop aircraft. PSC offered 5,607 annual departures, with 94 percent on either regional jet or turboprop aircraft. PDX had a total of 84,081 annual departures, with 46 percent on turboprop or regional jet aircraft. BOI offered a total of 18,782 annual departures, with approximately 66 percent on turboprop or regional jet aircraft.

TABLE 6.4 DEPARTURES BY AIRCRAFT TYPE BY ORIGIN

AIRCRAFT TYPE	SEAT RANGE	TOTAL DEPARTURES			
		PSC	PDX	BOI	PDT
Turboprop	<30	-	2,127	-	1,141
	30-50	-	4,310	-	-
	50+	2,116	24,187	6,480	-
Regional jet	30-50	2,112	2,151	2,530	-
	51-70	266	4,298	2,487	-
	71-100	763	1,793	852	-
Narrow body jet	70-125	-	3,061	4	-
	126-160	72	26,237	5,873	-
	160+	278	14,761	556	-
Wide body jet	160-240	-	536	-	-
	241-300	-	620	-	-
Total departures		**5,607**	**84,081**	**18,782**	**1,141**
% turboprop departures		**38%**	**36%**	**35%**	**100%**
% regional jet departures		**56%**	**10%**	**31%**	**0%**
Total seats		**398,144**	**398,145**	**398,146**	**10,540**

Source: Diio Mi; CY 2014

Increased Passenger Potential
An increase in retention of 10 percentage points would create an estimated additional 13,337 annual passengers (18.3 passengers daily each way) for PDT.

RETENTION RATE SENSITIVITY

Considering the previous factors of airfares, travel time, nonstop service and quality of service, a retention rate sensitivity follows in **Table 6.5**. The purpose is to show how small changes in passenger retention can affect passenger volume. Passengers in total and for each of the top 25 markets are calculated using varying degrees of retention. An increase in retention of 10 percentage points would create an estimated additional 13,337 annual passengers (18.3 passengers daily each way) for PDT.

TABLE 6.5 RETENTION RATE SENSITIVITY

RANK	DESTINATION	REPORTED PAX	RETENTION %	RETENTION IMPROVEMENT		
				5%	10%	15%
1	Las Vegas, NV	31	0	552	1,073	1,594
2	Portland, OR	7,415	81	7,875	8,335	8,795
3	Seattle, WA	39	1	373	707	1,041
4	Denver, CO	0	0	303	605	908
5	Phoenix, AZ (PHX)	9	0	261	513	765
6	Los Angeles, CA	45	1	271	497	723
7	Orange County, CA	11	0	198	385	572
8	San Diego, CA	21	1	166	310	455
9	San Francisco, CA	11	0	154	297	440
10	Phoenix, AZ (AZA)	0	0	125	249	374
11	Dallas, TX (DFW)	0	0	124	249	373
12	Washington, DC (DCA)	0	0	118	235	353
13	Honolulu, HI	21	1	132	243	354
14	Orlando, FL (MCO)	0	0	106	212	318
15	Chicago, IL (ORD)	0	0	87	174	261
16	Kahului, HI	18	1	102	187	271
17	Houston, TX (IAH)	0	0	79	158	237
18	Minneapolis, MN	20	1	98	176	255
19	Salt Lake City, UT	0	0	76	151	227
20	Guadalajara, Mexico	0	0	74	149	223
21	San Antonio, TX	0	0	69	138	206
22	Atlanta, GA	0	0	66	131	197
23	Sacramento, CA	40	3	104	167	231
24	Anchorage, AK	0	0	62	124	185
25	Boston, MA	0	0	59	119	178
	Total top 25	**7,682**	**10**	**11,633**	**15,584**	**19,535**
	Total domestic	**7,992**	**7**	**14,116**	**20,241**	**26,365**
	Total international	**0**	**0**	**544**	**1,088**	**1,632**
	Total of all markets	**7,992**	**6**	**14,660**	**21,329**	**27,997**

SITUATION ANALYSIS

PDT is located in Pendleton, nearly equidistant from Portland, Boise and Spokane. However, all three are located more than 200 miles away.

PDT serves a large area, and Pendleton is the economic hub of the area. The PDT catchment area (identified in **Exhibit 3.1** on page 5) is comprised of 30 zip codes with a population of 125,166.

Over the last 25 years, the Pendleton community has consistently had nonstop PDX service; however, carriers offering the service and the number of departures have changed. Air Oregon, Horizon Air, United Airlines and now SeaPort Airlines all offered nonstop service to PDX.

The relative remoteness of PDT's catchment area makes air service vitally important to its population. PDT's service today relies heavily on the EAS program to maintain service. Year-round subsidized service is provided by SeaPort and their nine-seat Pilatus PC-12 aircraft. SeaPort took over the EAS contract from Horizon Air that served the market previously with the 37-seat de-Havilland Dash 8 200 aircraft. SeaPort's current contract is in effect until December 31, 2016, at which time another airline could potentially bid on the service. PDT service will likely be impacted by EAS trends, discussed further in the following section.

Major Changes to EAS Program in 2012
One of the changes impacting PDT is the $200 per passenger subsidy cap for airports within 210 miles of a medium or large hub airport.

ESSENTIAL AIR SERVICE

Background

In 1978, the Airline Deregulation Act was enacted to preserve service to smaller communities. The program has been adjusted over the years to limit and sometimes eliminate which airports are deemed “Essential.” In 2012, Congress made several major changes to the EAS program:

- The program was capped at airports that were currently in the program. This means that there is no longer a safety net for any airports that were not currently subsidized.
- A $1,000 subsidy cap per passenger was put in place regardless of the distance to the hub.
- There is a 10 enplanement per service day minimum for airports within 175 miles of a medium or large hub airport.
- The US DOT plans on enforcing the $200 per passenger subsidy cap for airports within 210 miles of a medium or large hub airport for the year ending September 30, 2015.

The consequences of these changes have been significant for many communities. Four communities were eliminated due to the $1,000 passenger cap since the law was enacted including: Alamogordo, NM; Ely, NV; Lewiston, MT; and Miles City, MT. In addition to these four communities, in June 2014, 13 communities were notified of being eliminated from the EAS program for not meeting the 10 enplanement minimum. Twelve of those communities received a waiver from the US DOT for another year of subsidies.

The $200 per passenger subsidy cap is likely to affect additional communities. In 1990, Congress imposed the cap, and it was strictly enforced up until the late 2000s; however, it has largely been ignored for the past six to seven years. The US DOT has issued a “heads up” that they will strictly enforce the cap for year ending September 30, 2015. The show cause order is expected to be issued in January 2016. This gives communities time to work with airlines to fix any issues and gives Congress time to adjust up the cap as requested since it has remained unchanged for 25 years.

The trend in EAS over the past five years has been using smaller nine-seat aircraft or larger 50-seat regional jet aircraft. The growth in the use of regional jets has enabled communities to reach further for EAS service than before, bypassing the closest hub in favor of the stronger hub. The growth in smaller, nine-seat aircraft has enabled communities to have higher frequency levels than they would otherwise see with a larger turboprop aircraft. The change in pilot requirements for Part 121 carriers have more significantly impacted smaller airlines that rely on 19-seat and 30-seat turboprop aircraft. This has led to more routes being picked up by nine-seat Part 135 airlines. It is likely this trend will continue for the foreseeable future.

Impact on PDT

These changes have led to numerous cities losing air service, and the impact could affect PDT in the near future, particularly the $200 per passenger subsidy cap. The US DOT issued a recent update for calendar year 2014, and shows PDT with a per passenger subsidy of $229. Unless PDT is able to reduce that number under $200, PDT will be at risk of losing federal subsidies, and likely all air service at the airport. The US DOT has stated that there will be a mechanism requesting a waiver from the Secretary of Transportation. It is likely to be issued to communities that can demonstrate significant extenuating circumstances that affected passenger numbers.

PDT is not up for the US DOT EAS selection process until the end of 2016. In the future, the primary goal will be to secure a multi-year contract with an air carrier that will allow the airport to maximize enplanements. The goal of many EAS communities is to reach and maintain 10,000 enplanements, thereby allowing the community to have access to $1 million in annual AIP funding, instead of just the $150,000 available to airports under that threshold. Unfortunately, unless a carrier with a larger seating capacity aircraft serves PDT, the airport will not likely attain this goal.

Recently, PenAir was selected by the US DOT to provide EAS service from Crescent City, CA, to PDX. PenAir operates 30-seat Saab 340 aircraft. PenAir is also a codeshare partner with Alaska Airlines, providing seamless connections to Alaska's nonstop markets at PDX. PenAir is expected to continue to grow their PDX operations and would possibly bid on the PDT contract when it becomes available.

NON-ESSENTIAL AIR SERVICE AIRLINE DISCUSSION

The following subsection discusses potential opportunities by airline. Discussion of airline hub opportunities are limited to hubs within 1,000 miles of PDT. Equipment availability and airline trends are discussed by airline.

Alaska Airlines

Alaska is consistently one of the more profitable of the major airlines. Looking forward, it is anticipated that Alaska will continue to add flying to Seattle in response to Delta's growth and competition in Seattle. The majority of Alaska's flying is based in Seattle and PDX, but Alaska has made overtures to focus cities in California. Alaska has placed a large order for more Boeing aircraft, specifically 50 Boeing 737-900ERs and the Boeing 737MAX.

Table 7.1 compares Alaska's departures and seats in July 2015 with the prior year and provides a summary of aircraft in use in July 2015 for hubs within 1,000 miles of PDT, including Los Angeles International Airport (LAX), PDX, San Diego International Airport (SAN) and Seattle-Tacoma International Airport (SEA). Overall, Alaska has grown operations at PDX and SEA while remaining stagnant or decreasing operations at LAX and SAN. Turboprop and regional jet flying comprises approximately 68 percent of operations at PDX and 45 percent of operations at SEA. The regional jet operations are contracted through SkyWest Airlines with the Canadair Regional Jet (CRJ)-700 and the Embraer Regional Jet (ERJ)-175.

TABLE 7.1 ALASKA - HUB CHANGES

STATISTICAL ITEM		HUB			
		LAX	PDX	SAN	SEA
Weekly Seats - July 2015		42,122	89,276	24,984	250,619
Weekly Seats - July 2014		41,773	82,029	25,490	230,421
Weekly Seats - % Change		1	9	(2)	9
Weekly Departures - July 2015		278	870	178	2,060
Weekly Departures - July 2014		287	823	178	1,886
Weekly Departures - % Change		(3)	6	0	9
Aircraft in Use:					
Turboprops	50+	48	525	28	823
Regional Jets	51-70	0	49	14	77
	71+	0	14	0	28
Mainline		230	282	136	1,132
Total Aircraft - July 2015		**278**	**870**	**178**	**2,060**

With the current regional fleet that Alaska operates of 70-plus seat regional jet and turboprop aircraft, it is unlikely that Alaska would serve PDT in the near future. However, if Alaska's relationship with PenAir continues to expand, which is likely, PenAir's 30-seat aircraft would be a good fit for the PDT market.

Allegiant

In general, Allegiant's leisure destination oriented service is focused primarily on service to Las Vegas' McCarran International Airport (LAS), Orlando-Sanford, Tampa-St. Petersburg, Phoenix-Mesa Gateway Airport (AZA) and Punta Gorda. With the exception of Las Vegas, service is provided through secondary airports (e.g. Sanford, Mesa). Service is generally on a less than daily basis (two to three times weekly) from cities having limited access to service at larger airports.

Allegiant continues to discuss opportunities to Mexico and the Caribbean with potential service initiation in 2015. Allegiant has been changing their strategy with several larger market adds in 2014, including Cincinnati, Indianapolis, Omaha, Oklahoma City, Pittsburgh and Tulsa. Allegiant currently serves 99 cities with the majority of their growth in these top markets.

Allegiant's fleet is primarily composed of McDonnell Douglas (MD)-80 aircraft reconfigured to 166-seats, representing 67 percent of their fleet. Allegiant added six Boeing 757 aircraft to facilitate their entry into the Hawaiian market. The Boeing 757 gave Allegiant the potential to serve longer haul domestic mainland markets. Allegiant also took delivery of several Airbus A319/A320 aircraft, anticipating 30 total aircraft by 2018. The A319/320 can serve longer distances than the MD-80 aircraft.

Table 7.2 compares Allegiant's departures and seats in July 2015 with the prior year and provides a summary of aircraft in use in July 2015 for focus cities within 1,000 miles of PDT, including AZA, LAS, LAX and Oakland International Airport (OAK). Overall, Allegiant has grown operations at AZA, LAS and LAX but reduced operations at OAK year-over-year, with the largest percentage growth at LAX.

TABLE 7.2 ALLEGIANT - FOCUS MARKET CHANGES

STATISTICAL ITEM	FOCUS MARKET			
	AZA	LAS	LAX	OAK
Weekly Seats - July 2015	14,888	26,946	10,470	3,306
Weekly Seats - July 2014	14,372	26,038	8,652	3,632
Weekly Seats - % Change	4	3	21	(9)
Weekly Departures - July 2015	93	156	60	21
Weekly Departures - July 2014	88	152	50	22
Weekly Departures - % Change	6	3	20	(5)
Aircraft in Use:				
Mainline - Boeing 757	0	20	10	0
Mainline - Airbus A319/A320	55	19	11	18
Mainline - MD80	38	117	39	3
Total Aircraft - July 2015	**93**	**156**	**60**	**21**

While LAS is the largest true market for PDT, the majority of the traffic is diverting to PSC, and specifically on the nonstop Allegiant service. With PSC nonstop service just 70 miles away from PDT, it is unlikely that Allegiant would add service to PDT in addition to their PSC service.

American Airlines

The American/US Airways merger officially closed December 9, 2013. The merged airline is now the largest airline in the world. While the merged airline has codeshares already in place, pricing has issues, unions still need to be combined and the frequent flyer program, with AAdvantage being the surviving program, is currently being merged using features of both programs. A single operating certificate is anticipated in 2015.

The new American has started to connect the dots across the system with several new market adds to traditional US Airways hubs. American's strength was primarily north to south, from Michigan to Mexico, as well as the Caribbean. US Airways' strength was primarily in the Northeast and Southeast; however, they also had service in larger southern California markets. It is unlikely that American will have major structural changes to their network like United Airlines, Delta Air Lines and Southwest Airlines post-merger. Phoenix-Sky Harbor International Airport (PHX) is the only hub potentially "at-risk".

Prior to the merger, American placed a record order for 500-plus aircraft in 2011/2012. The order replaces: MD-80 aircraft with Boeing 737-800 and Airbus A319s; Boeing 757s with Airbus A321s; and Boeing 767-200 aircraft with Airbus A321Ts. In addition to the aircraft ordered for replacement, the order also includes added Boeing 777-300ER aircraft for the longer stage length routes, Boeing 787-8, Boeing 787-9 and Airbus A350-900 aircraft. American also ordered more than 100 76-seat

American Airlines
While there has been some growth at LAX, American has generally not added service in smaller, north-south markets. Due to the size of the market and distance to American hubs, it is unlikely that they would serve PDT.

regional jets including the CRJ-900 and ERJ-175. This large influx of new aircraft sets American on a path to have the youngest fleet of the legacy airlines.

Table 7.3 compares American's departures and seats in July 2015 with the prior year and provides a summary of aircraft in use in July 2015 for hubs within 1,000 miles of PDT. American has two hubs within 1,000 miles of PDT, LAX and PHX. American has been actively growing LAX, with an increase of 7 percent in departures and 9 percent in seats, while American has decreased departures at PHX by 1 percent and increased seats with larger gauge aircraft by 3 percent. American operates a higher number of regional jets at PHX than LAX but no turboprops are operated at either hub.

TABLE 7.3 AMERICAN - HUB CHANGES

STATISTICAL ITEM		HUB	
		LAX	PHX
Weekly Seats - July 2015		175,446	277,660
Weekly Seats - July 2014		161,405	270,108
Weekly Seats - % Change		9	3
Weekly Departures - July 2015		1,368	2,121
Weekly Departures - July 2014		1,283	2,143
Weekly Departures - % Change		7	(1)
Aircraft in Use:			
Regional Jets	30-50	286	264
	51-70	7	0
	71-100	195	429
Mainline		880	1,428
Total Aircraft - July 2015		**1,368**	**2,121**

While there has been some growth at LAX, American has generally not added service in smaller, north-south markets. One of the smaller markets with service is Redmond, OR; however, Redmond's market size is significantly larger than PDT. Due to the size of the market and distance to American hubs, it is unlikely that they would serve PDT.

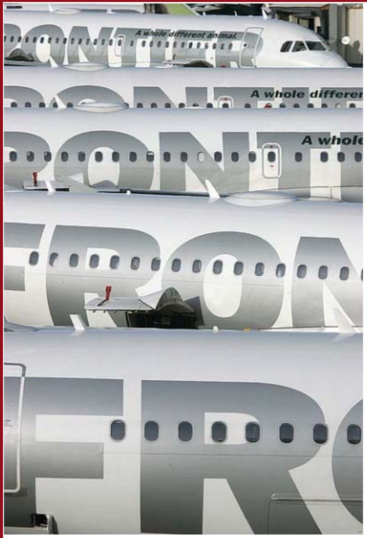
Delta Air Lines

Delta operates an extensive route network with hubs/focus cities at Atlanta, Minneapolis, Detroit, Salt Lake City International Airport (SLC), New York LaGuardia and Kennedy, Los Angeles and Seattle. Delta eliminated Memphis as a hub in their network and has been active in creating an international hub at Seattle.

TABLE 7.4 DELTA - HUB CHANGES

STATISTICAL ITEM		HUB		
		LAX	SEA	SLC
Weekly Seats - July 2015		157,510	114,051	186,008
Weekly Seats - July 2014		132,217	85,036	180,596
Weekly Seats - % Change		19	34	3
Weekly Departures - July 2015		1,112	868	1,707
Weekly Departures - July 2014		957	544	1,793
Weekly Departures - % Change		16	60	(5)
Aircraft in Use:				
Regional Jets	30-50	0	0	447
	51-70	4	232	128
	71-100	401	204	301
Mainline		707	432	831
Total Aircraft - July 2015		**1,112**	**868**	**1,707**

Delta has reduced the total number of 50-seat regional jets in its network while adding larger regional jets and mainline flying. This includes reducing the number of 50-seat regional jets from nearly 310 aircraft to 100 by the end of 2015. Delta is in the process of acquiring 88 Boeing 717 aircraft and 100 Boeing 737-900ER. **Table 7.4** compares Delta's departures and seats in July 2015 with the prior year and provides a summary of aircraft in use in July 2015 for hubs within 1,000 miles of PDT, including LAX, SEA and SLC. Delta's growth in the West has been focused on SEA, with an increase in operations of 60 percent. Delta has also grown operations at LAX, with an increase of 16



percent. However, most of this growth at SEA and LAX has been in larger markets. At SLC, Delta has actively been reducing operations as they replace the smaller 50-seat regional jets with larger regional jets as they come available.

With SLC just 484 miles from PDT, the hub is within reasonable range of a 50-seat regional jet; however, with a local PDT market size of just 2.1 PDEW and the current fleet plan from Delta to reduce the number of 50-seat aircraft, the service is unlikely.

Frontier Airlines

Frontier was purchased by Indigo Partners, which previously owned Spirit Airlines. Indigo is transforming Frontier into an ultra low-cost carrier, similar to Spirit. Frontier has announced significant reductions at Denver, particularly to/from smaller cities, and added service to larger markets including Orlando and Chicago O'Hare. Frontier uses the Airbus A319 and the Airbus A320 for their operations.

Table 7.5 compares Frontier's departures and seats in July 2015 with the prior year and provides a summary of aircraft in use in July 2015 for hubs within 1,000 miles of PDT, which is limited to Denver International Airport (DEN). Frontier has significantly reduced operations at DEN, with a decrease in departures and seats of 43 percent year-over-year. Much of this decrease occurred in the smaller markets that Frontier previously served on a less than daily basis.

TABLE 7.5 FRONTIER - HUB CHANGES

STATISTICAL ITEM	HUB
	DEN
Weekly Seats - July 2015	65,718
Weekly Seats - July 2014	115,668
Weekly Seats - % Change	(43)
Weekly Departures - July 2015	451
Weekly Departures - July 2014	791
Weekly Departures - % Change	(43)
Aircraft in Use:	
Mainline - A319/320	451
Total Aircraft - July 2015	**451**

With the direction that Frontier has made on reducing their presence in smaller markets in favor of adding service in major large hub airports like Atlanta or Chicago, it is highly unlikely in their current business model to add service to PDT. Their reliance upon larger mainline aircraft also exacerbates the difficulty of adding new service at PDT.

United Airlines

In 2012, United/Continental Airlines completed their merger. While the merged company continues to work towards full integration, United has suffered through a series of issues in their reservations and operating systems. In 2013, United experienced the grounding of their Boeing 787 fleet due to safety concerns. Wall Street and United's unions have publicly questioned United's performance in comparison to American and Delta.

With regard to aircraft, United is expected to increase the use of large regional aircraft to 255 by 2016 with 102 70-seat regional jets and 153 76-seat regional jets being added. With a hard cap of 450 regional aircraft this will require a reduction of the existing 300-plus 50-seat regional jets in the network today. Seventy of the ERJ-175 aircraft (76-seat, dual class) are slated for delivery in 2014 and 2015 with the balance delivered in the future.

United operates hubs at Houston Intercontinental, Chicago O'Hare, Newark, DEN, San Francisco, Washington Dulles, and to a lesser extent LAX. United hubs all have major competition with one or more other airlines**. Table 7.6** shows seats, departures and type of aircraft operated at United's hubs within 1,000 miles of PDT, including DEN, LAX and San Francisco International Airport (SFO).

TABLE 7.6 UNITED - HUB CHANGES

STATISTICAL ITEM		HUB		
		DEN	LAX	SFO
Weekly Seats - July 2015		272,695	153,918	275,252
Weekly Seats - July 2014		266,545	164,283	266,884
Weekly Seats - % Change		2	(6)	3
Weekly Departures - July 2015		2,801	1,115	2,026
Weekly Departures - July 2014		2,955	1,427	2,190
Weekly Departures - % Change		(5)	(22)	(7)
Aircraft in Use:				
Turboprops	50+	251	0	0
Regional Jets	30-50	887	144	390
	51-70	537	176	138
	71-100	0	66	237
Mainline		1,126	729	1,261
Total Aircraft - July 2015		**2,801**	**1,115**	**2,026**

Recently, United has pulled down service at LAX citing a concerted effort to reduce their presence at LAX. While DEN and SFO are much larger hubs, there have also been overall reductions at those two hubs. Sixty percent of the service at DEN is operated with large turboprops or regional jets while no turboprops are used at LAX or SFO and the percentage of total regional jet operations is 38 percent or less.

United has made moves over the past year to reduce their 50-seat fleet significantly by 2017, which will greatly impact their ability to serve smaller regional markets going forward. However, SFO is a major hub for United and is 586 miles from PDT, well within range of a regional jet. SFO is the ninth largest true market for PDT with 3.9 PDEW and would provide access to many of the top destinations in the West region. United has been reluctant in recent years to add service to EAS markets, and that will likely be an additional barrier to entry for the foreseeable future.

APPENDIX A. TOP 50 TRUE MARKETS

TABLE A.1 TOP 50 TRUE MARKETS

RANK	DESTINATION	REPORTED PAX	RETENTION %	TRUE MARKET	PDEW	ORIGIN AIRPORT OF DIVERTING PAX			
						PSC	PDX	BOI	OTHER
1	Las Vegas, NV	31	0	10,421	14.3	7,073	1,134	774	1,408
2	Portland, OR	7,415	81	9,199	12.6	1,784	0	0	0
3	Seattle, WA	39	1	6,684	9.2	4,849	0	0	1,797
4	Denver, CO	0	0	6,053	8.3	1,790	1,415	2,052	796
5	Phoenix, AZ (PHX)	9	0	5,037	6.9	1,695	822	1,459	1,051
6	Los Angeles, CA	45	1	4,524	6.2	1,485	1,523	510	962
7	Orange County, CA	11	0	3,738	5.1	1,682	1,204	153	688
8	San Diego, CA	21	1	2,895	4.0	548	1,217	542	567
9	San Francisco, CA	11	0	2,859	3.9	1,236	988	433	191
10	Phoenix, AZ (AZA)	0	0	2,491	3.4	2,491	0	0	0
11	Dallas, TX (DFW)	0	0	2,485	3.4	1,032	554	573	325
12	Washington, DC (DCA)	0	0	2,351	3.2	605	765	121	860
13	Honolulu, HI	21	1	2,219	3.0	242	1,179	414	363
14	Orlando, FL (MCO)	0	0	2,122	2.9	688	612	548	274
15	Chicago, IL (ORD)	0	0	1,740	2.4	580	593	382	185
16	Kahului, HI	18	1	1,681	2.3	178	1,128	210	147
17	Houston, TX (IAH)	0	0	1,580	2.2	522	548	319	191
18	Minneapolis, MN	20	1	1,562	2.1	739	127	503	172
19	Salt Lake City, UT	0	0	1,510	2.1	796	178	440	96
20	Guadalajara, Mexico	0	0	1,487	2.0	907	541	19	19
21	San Antonio, TX	0	0	1,376	1.9	714	242	293	127
22	Atlanta, GA	0	0	1,313	1.8	401	350	370	191
23	Sacramento, CA	40	3	1,270	1.7	306	421	363	140
24	Anchorage, AK	0	0	1,236	1.7	280	306	153	497
25	Boston, MA	0	0	1,185	1.6	274	503	331	76
26	Ontario, CA	10	1	1,183	1.6	618	255	159	140
27	Kona, HI	0	0	1,179	1.6	96	790	217	76
28	Nashville, TN	0	0	1,141	1.6	325	255	210	350
29	Omaha, NE	0	0	1,045	1.4	395	127	497	25
30	San Jose, CA	85	8	1,009	1.4	255	306	293	70
31	New Orleans, LA	0	0	994	1.4	306	325	261	102
32	Fort Lauderdale, FL	0	0	981	1.3	217	433	268	64

TABLE A.1 TOP 50 TRUE MARKETS

RANK	DESTINATION	REPORTED PAX	RETENTION %	TRUE MARKET	PDEW	ORIGIN AIRPORT OF DIVERTING PAX			
						PSC	PDX	BOI	OTHER
33	Miami, FL	0	0	949	1.3	217	452	198	83
34	Kansas City, MO	0	0	937	1.3	338	293	255	51
35	Long Beach, CA	0	0	937	1.3	121	720	64	32
36	St. Louis, MO	0	0	930	1.3	497	204	108	121
37	Reno, NV	20	2	855	1.2	338	217	102	178
38	Austin, TX	0	0	822	1.1	299	319	147	57
39	Indianapolis, IN	0	0	803	1.1	185	217	331	70
40	New York, NY (JFK)	0	0	784	1.1	102	491	115	76
41	Philadelphia, PA	0	0	777	1.1	249	306	127	96
42	Oklahoma City, OK	0	0	777	1.1	363	153	178	83
43	Palm Springs, CA	0	0	733	1.0	159	217	172	185
44	Springfield, MO	0	0	720	1.0	147	255	217	102
45	Tampa, FL	0	0	707	1.0	178	261	172	96
46	Lihue, HI	0	0	695	1.0	134	408	102	51
47	Washington, DC (IAD)	0	0	682	0.9	159	268	198	57
48	Cancun, Mexico	0	0	673	0.9	113	283	225	51
49	Puerto Vallarta, Mexico	0	0	656	0.9	132	428	80	16
50	Newark, NJ	0	0	656	0.9	210	319	64	64
Top 50 Destinations		**7,797**	**8**	**100,645**	**137.9**	**39,053**	**24,649**	**15,723**	**13,423**
Total Domestic		**7,992**	**7**	**122,486**	**167.8**	**45,770**	**30,267**	**22,024**	**16,433**
Total International		**0**	**0**	**10,879**	**14.9**	**2,932**	**4,579**	**2,205**	**1,163**
Total All Markets		**7,992**	**6**	**133,365**	**182.7**	**48,702**	**34,846**	**24,229**	**17,596**

APPENDIX B. GLOSSARY

Airline codes

AA .... American Airlines
AS ....Alaska Airlines
DL ....Delta Air Lines
F9.. Frontier Airlines
G4 .... Allegiant Air
UA .... United Airlines
US ....US Airways
WN ....Southwest Airlines

Airport catchment area (ACA)

The geographic area surrounding an airport from which that airport can reasonably expect to draw passenger traffic. The airport catchment area is sometimes called the service area.

Airport codes

AZA ....Phoenix-Mesa, AZ
BOI...Boise, ID
DAL ....Dallas-Love Field, TX
DCA ....Washington-National, DC
DEN .... Denver, CO
DFW.................................Dallas-Ft. Worth, TX
IAD ....Washington-Dulles, DC
IAH ....Houston-Intercontinental, TX
JFK............................. New York-Kennedy, NY
LAS .... Las Vegas, NV
LAX .... Los Angeles, CA
LHR........................London-Heathrow, England
MCO.......................... Orlando-International, FL

Airport Codes (continued)

OAK .... Oakland, CA
ORD.................................Chicago-O'Hare, IL
PDT .... Pendleton, OR
PDX ....Portland, OR
PHX .... Phoenix-Sky Harbor, AZ
PSC ....Pasco, WA
SAN ....San Diego, CA
SEA ....Seattle, WA
SFO ....San Francisco, CA
SLC....................................Salt Lake City, UT

ARC

Acronym for Airline Reporting Corporation.

Average airfare

The average of the airfares reported by the airlines to the US DOT. The average airfare does not include taxes or passenger facility charges and represents one-half of a roundtrip ticket.

CAGR

Abbreviation for compounded annual growth rate, or the average rate of growth per year over a given time period.

Destination airport

Any airport where the air traveler spends four hours or more. This is the Federal Aviation Administration definition.

Diversion

Passengers who do not use the local airport for air travel, but instead use a competing airport to originate the air portion of their trip.

Enplanement

A passenger boarding a commercial aircraft.

FAA

Acronym for the Federal Aviation Administration.

Hub

An airport used by an airline as a transfer point to get passengers to their intended destination. It is part of a hub and spoke model, where travelers moving between airports not served by direct flights change planes en route to their destination. Also an airport classification system used by the FAA (e.g., non-hub, small hub, medium hub, and large hub.

Initiated (origin) passengers

Origin and destination passengers who began their trip from within the catchment area.

Load factor
The percentage of airplane capacity that is used by passengers.

Local market
The number of air travelers who travel between two points via nonstop air service.

Micro
Acronym for Micropolitan Statistical Area. Micros have at least one urban cluster with a population ranging from 10,000 to 50,000 that has a high degree of social and economic integration with the core as measured by commuting ties.

Narrow-body jet
A jet aircraft with a single aisle designed for seating over 100 passengers.

Nonstop flight
Air travel between two points without stopping at an intermediate airport.

Onboard passengers
The number of passengers transported on one flight segment.

Origin and destination (O&D) passengers
Includes all originating and destination passengers. In the context of this report, it describes the passengers arriving and departing an airport.

Originating airport
The airport used by an air traveler for the first enplanement of a commercial air flight.

Passenger Facility Charge
Fee imposed by airports of $1 to $4.50 on enplaning passengers. The fees are used by airports to fund FAA approved airport improvement projects.

Pax
Abbreviation for passengers.

PDEW
Abbreviation for passengers daily each way.

Point-to-point
Nonstop service that does not stop at an airline's hub and whose primary purpose is to carry local traffic rather than connecting traffic.

Referred passengers
Origin and destination passengers who began their trip from outside the catchment area.

Regional jet
A jet aircraft with a single aisle designed for seating fewer than 100 passengers.

Retained passengers (retention)
Passengers who use the local airport for air travel instead of using a competing airport to originate the air portion of their trip.

True market
Total number of air travelers, including those who are using a competing airport, in the geographic area served by PDT. The true market estimate includes the size of the total market and for specific destinations.

Turboprop aircraft
A type of engine that uses a jet engine to turn a propeller. Turboprops are often used on regional and business aircraft because of their relative efficiency at speeds slower than, and altitudes lower than, those of a typical jet.

US DOT
Acronym for US Department of Transportation.

Wide-body jet
A jet aircraft with two aisles designed for seating greater than 175 passengers.

FOR MORE INFORMATION, PLEASE CONTACT

MEAD & HUNT, INC. ■ 9600 NE CASCADES PARKWAY, SUITE 100 ■ PORTLAND, OR 97220

503-548-1494 ■ WWW.MEADHUNT.COM

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Commercial Service Forecasts

Commercial service forecasts consider passenger boardings (enplanements) and take offs and landings (operations) by commercial airlines at PDT. This section focuses on scheduled passenger airlines. On demand passenger airlines and scheduled and on-demand cargo carriers are captured as "other air taxi/commuter." Commercial service is classified by the FAA as "air carrier," which means airlines operating with an air carrier certificate for enplanements, and aircraft with 60 or more passenger seats for operations; and "air taxi/commuter" which means airlines operating as regional air carriers for enplanements, and aircraft with 59 or fewer seats for operations. This report builds on the Passenger Demand Analysis for PDT, included as **Appendix B**.

The Passenger Demand Analysis reviewed where travelers in the PDT service area were flying to, and how many passengers were using nearby airports including Pasco Tri-Cities (PSC), Boise (BOI), and Portland (PDX) instead of flying out of PDT. PDT is an "essential air service" airport, meaning that air carriers receive a federal subsidy to operate routes from PDT. The essential air service program is described in detail in the Passenger Demand Analysis.

The Passenger Demand Analysis found that Las Vegas (LAS) was the top destination market for travelers in the PDT service area, with 10,421 annual passengers (arriving and departing). The top five markets are shown in **Table 1**. These markets are served by nearby airports with the exception of PDX. The forecasts present a scenario which considers the impact of a direct flight to LAS.

Table 1: Top Destinations from PDT Catchment Area

		Origin Airport (%)					
Rank	Destination	PSC	PDX	BOI	PDT	Other	Total Passengers
1	Las Vegas	66	11	7	0	14	10,421
2	Portland	19	0	0	81	0	9,199
3	Seattle	73	0	0	0	27	6,684
4	Denver	30	23	34	0	13	6,053
5	Phoenix	34	16	29	0	21	5,037

Commercial Service History

PDT is served by SeaPort airlines, which uses nine seat Cessna 208 Caravan aircraft for flights to and from PDX. Analysis of the U.S. Department of Transportation T-100 database (T-100 database) is shown in **Table 2**. The T-100 data is standardized to match data included in the FAA terminal area forecast (TAF). The T-100 data is more specific than the TAF, and allows operations to be matched to an air carrier. The forecast breaks out operations as those that are scheduled (and reported in the T-100 database), and those that are not (and are not reported in the T-100 database). The T-100 database also provides data on the average number of passenger per departure, and the load factor (number of seats occupied divided by the number of seats available). TAF forecasts are shown in **Table 2**.

Table 2: Commercial Service History		
Category	2009	2014
Air Carrier Enplanements	0	0
Air Taxi Enplanements	3,947	4,174
Air Carrier Operations	94	6
Air Taxi Operations	6,076	3,813
Scheduled Air Taxi Operations	*4,124*	*2,214*
Non-Scheduled Air Taxi Operations	*1,952*	*1,599*
Average Passengers per Departure	3.6	3.8
Average Load Factor	40%	42%

Table X: FAA Terminal Area Forecast							
		2009	2014	2020	2025	2030	2035
Enplanements	Air Carrier	0	0	0	0	0	0
	Air Taxi	3,947	4,174	4,346	4,497	4,660	4,829
	Total	**3,947**	**4,174**	**4,346**	**4,497**	**4,660**	**4,829**
Operations	Air Carrier	94	6	6	6	6	6
	Air Taxi/Commuter	4,124	3,813	3,903	3,978	4,053	4,128
	Total	**4,218**	**3,819**	**3,909**	**3,984**	**4,059**	**4,134**

Commercial Service Forecast Scenarios

There are four scenarios presented for future scheduled commercial service at PDT. These scenarios represent a sensitivity analysis to changes in aircraft and airlines at PDT, and illustrate how passenger enplanements and operations will vary. The scenarios include continuation of SeaPort service as it exists, change from SeaPort to another EAS carrier that uses larger aircraft, entry of a leisure carrier, and loss of EAS subsidy. Each is compared to the FAA Terminal Area Forecast. Assumptions included in each scenario are described below.

Forecast scenarios assume that passenger enplanements will grow in line with the local economy. Analysis considers a hybrid index comprised of population, employment, business earnings, personal income, gross regional product, and total retail sales for Umatilla County. This index assumes that as the local economy and population base grow, demand for air travel will grow in kind. The Passenger Demand Analysis indicates that many air travelers in Umatilla County use PSC for air service; which represents a barrier to additional air service at PDT. An average annual growth rate of 1.64 percent is applied to passenger enplanements at PDT, and it is expected that other passengers will continue to use air service at other airports.

Scenario 1: Continuation of SeaPort Service

Scenario 1 assumes that SeaPort service will continue as it exists today throughout the 20-year forecast period. SeaPort is classified as "air taxi/commuter" and does not impact "air carrier" operations per TAF reporting standards. Using the 1.64 percent growth rate for passenger enplanements, it is expected that 6,100 passengers will fly out of PDT on 9-seat aircraft by 2035. Between 2009 and 2014, load factors grew by an annual average of 0.74 percent. This growth rate is applied to future load factors, and forecasts for Scenario 1 expect load factors to grow from 42 percent in 2014 to 49 percent in 2035.

Air taxi/commuter operations are forecast using passenger enplanement forecasts, aircraft seating capacity, and expected load factor. There are 2,780 scheduled air taxi/commuter operations expected in 2035. Based on historical records indicating that the relationship of scheduled to non-scheduled commuter/air taxi operations is 0.9, 2.380 non-scheduled air taxi operations are expected. A summary of Scenario 1 is included in **Table 3**.

Table 3: Scenario 1

		2009	2014	2020	2025	2030	2035
Enplanements	Air Carrier	0	0	0	0	0	0
	Air Taxi	3,947	4,174	4,600	5,000	5,400	5,900
	Total	**3,947**	**4,174**	**4,600**	**5,000**	**5,400**	**5,900**
Operations	Air Carrier	94	6	0	0	0	0
	Passenger Air Taxi/Commuter	2,172	2,214	2,330	2,540	2,550	2,680
	Other Air Taxi/Commuter	1,952	1,599	1,990	2,090	2,180	2,290
	Total	**4,218**	**3,819**	**4,320**	**4,540**	**4,730**	**4,970**

Risks to Scenario 1 include the loss of EAS subsidy, without this, SeaPort service would likely not remain viable. This risk is explored in more detail in the Passenger Demand Analysis. Other risks for Scenario 1 include the departure of SeaPort from the market, and change in aircraft type to one with more seats.

If SeaPort leaves the market, PDT will be dependent on another carrier picking up the EAS route in order to maintain air service. As indicated in the Passenger Demand Analysis, the mainline air carriers' latest market approach shows a reluctance to enter EAS markets. Further, mainline air carriers are reducing the number of small aircraft in their fleets, in favor of aircraft with more seats. This will limit the availability of an appropriately sized aircraft to serve PDT should SeaPort leave. Given that PDT averages approximately four passengers per departure, an aircraft larger than the nine seat Cessna Caravan will not likely be economically viable.

Scenario 1 is viable provided PDT is able to maintain EAS and service with SeaPort or a carrier operating a similarly sized aircraft. Scenario 1 enplanements are 6 percent above the TAF in 2020, 11 percent above the TAF in 2025, and 22 percent above the TAF in 2035. Scenario 1 operations are 11 percent above the TAF in 2020, 14 percent above the TAF in 2025, and 20 percent above the TAF in 2035.

Scenario 2: New EAS Operator

Scenario 2 assumes that the EAS contract will be taken over by a carrier that operates larger aircraft. The Passenger Demand Analysis describes how PenAir, a regional carrier that operates in the Northeastern United States and in Alaska, is scheduled to begin service from Crescent City, CA to PDX. PenAir operates 30 seat Saab 340 aircraft. Introduction of a larger aircraft type will not impact passenger demand; therefore, the carrier will have to adjust flight frequencies to make the route viable. This carries the risk that the new schedule with reduced flights will be less convenient for PDT travelers, causing them to use other airports.

Passenger demand for Scenario 2 uses the same 1.64 percent average annual growth rate as in Scenario 1, with 5,900 passengers expected to enplane at PDT in 2035. Analysis of the T-100 database for PenAir's Alaska routes shows that their average annual load factor was 33 percent in 2014, equivalent to 9.9 passengers per departure. In order to accommodate these extra passengers, the carrier would decrease scheduled commercial operations to 870 in 2035. This decrease reflects the larger seating capacity of the aircraft, and the increasing load factor (using the historical 0.74 percent annual average growth rate). A load factor of 47 percent is forecast in 2035. A summary of Scenario 2 is included in **Table 4**.

Table 4: Scenario 2

		2009	2014	2020	2025	2030	2035
Enplanements	Air Carrier	0	0	0	0	0	0
	Air Taxi	3,947	4,174	4,600	5,000	5,400	5,900
	Total	**3,947**	**4,174**	**4,600**	**5,000**	**5,400**	**5,900**
Operations	Air Carrier	94	6	0	0	0	0
	Passenger Air Taxi/Commuter	4,124	2,214	930	930	890	840
	Other Air Taxi/Commuter	1,952	1,599	1,990	2,090	2,180	2,290
	Total	**4,218**	**3,819**	**2,920**	**3,020**	**3,070**	**3,130**

Operations totals in Scenario 2 suggest that the new carrier would operate 1.2 departures per day (assuming daily service), meaning that some days would see only one departure, and others might see two. SeaPort currently offer three daily departures from PDT. Less frequent departures may incentivize travelers to use another airport. The carrier would likely increase frequencies if they were able to sell sufficient seats to make the route economically viable. With an EAS subsidy, it is expected that a load factor above 30 percent will make the route viable. Without EAS, the carrier may require a load factor closer to 70 percent (21 passengers per departure).

Scenario 2 is viable under modest passenger demand growth provided PDT retains the EAS subsidy, and the loss of flight frequency does not have significant impact on passenger choice to use PDT. Scenario 2 enplanements are 6 percent above the TAF in 2020, 11 percent above the TAF in 2025, and 22 percent above the TAF in 2035. Scenario 1 operations are 25 percent below the TAF in 2020, 24 percent below the TAF in 2025, and 24 percent below the TAF in 2035.

Scenario 3: EAS Continues, New Leisure Market Service Begins

Las Vegas was identified as the number one destination for travelers from the PDT service area, and 66 percent of travelers use PSC for air service. PSC has direct service to LAS on Allegiant Airlines, and other carriers offer connecting service via Salt Lake City, Seattle, Portland, San Francisco, and Denver. The Passenger Demand Analysis indicated that it is unlikely that Allegiant Airlines would set up service at PDT with PSC service existing; however, this analysis considers the impact of a once-weekly flight to LAS to be operated by an air carrier using 150 seat aircraft (MD-80, Airbus A321, or Boeing 737).

Scenario 3 assumes that EAS will continue with similar flight frequencies and aircraft size as what exists in 2014. Air taxi enplanements will grow at 1.64 percent annually, on average. Air carrier enplanements are calculated using aircraft size, expected load factor, and flight frequency. The forecast adds flight frequencies by a 150 seat aircraft in later years, assuming that the route is financially viable and demand supports the new frequencies. Assumptions include three flights a month in 2020, weekly flights in 2025, and twice weekly flights in 2035. A summary of Scenario 3 is included in **Table 5**.

Table 5: Scenario 3

		2009	2014	2020	2025	2030	2035
Enplanements	Air Carrier	0	0	4,900	6,500	6,500	8,400
	Air Taxi	3,947	4,174	4,600	5,000	5,400	5,900
	Total	**3,947**	**4,147**	**9,500**	**11,500**	**11,900**	**14,300**
Operations	Air Carrier	94	6	72	96	96	125
	Passenger Air Taxi/Commuter	2,172	2,214	2,330	2,540	2,550	2,680
	Other Air Taxi/Commuter	1,952	1,599	1,990	2,090	2,180	2,290
	Total	**4,218**	**3,819**	**4,392**	**4,636**	**4,826**	**5,095**

Scenario 3 has significant implications for PDT, both in terms of AIP funding and facility requirements. If PDT is able to secure service to a vacation-destination such as LAS or a similar market, passenger enplanement levels would double. This effect would become more pronounced in later years should the carrier increase frequencies. In addition to Allegiant, there are a number of airlines that operate periodic charter flights on behalf of casino companies to the southwest. If the PDT market is able to fill such flights, then scheduled service may be justified.

The biggest risk to Scenario 3 is the proximity of the PDT catchment area to PSC, as indicated by the high percentage of LAS-bound passengers diverting to PSC. Airlines respond to customer demand to a certain degree; however if customers continue to support LAS-bound service from PSC, then it is unlikely that a carrier will begin scheduled service at PDT. Attraction of this type of service will likely require direct marketing efforts between airport management, the airlines, and tourist bureaus at the destination market.

Scenario 3 enplanements are 119 percent above the TAF in 2020, 156 percent above the TAF in 2025, and 196 percent above the TAF in 2035. Scenario 3 operations are 12 percent above the TAF in 2020, 16 percent above the TAF in 2025, and 23 percent above the TAF in 2035.

Scenario 4A: EAS Subsidy Ends

Scenarios 4A and 4B analyze the impact that losing the EAS subsidy might have on scheduled commercial operations at PDT. Scenario 4A assumes that the EAS subsidy ends at PDT, and carriers must make the routes economically viable on their own. In order for this to happen, it is expected that fares would need to be increased from the $99 average (PDT-PDX), and load factors would also need to increase. The EAS subsidy averages out to $229 per passenger, therefore, elimination of this subsidy could put ticket prices above $300 each way. Airlines practice dynamic pricing and change prices based on many factors – including time until departure, and how many seats have been sold on the flight; therefore, prices may be well above or below the average. Given that higher prices do not typically increase demand, it is expected that passenger enplanement levels will stagnate at 2014 levels if the EAS subsidy goes away. A summary of Scenario 4A is included in **Table 6**.

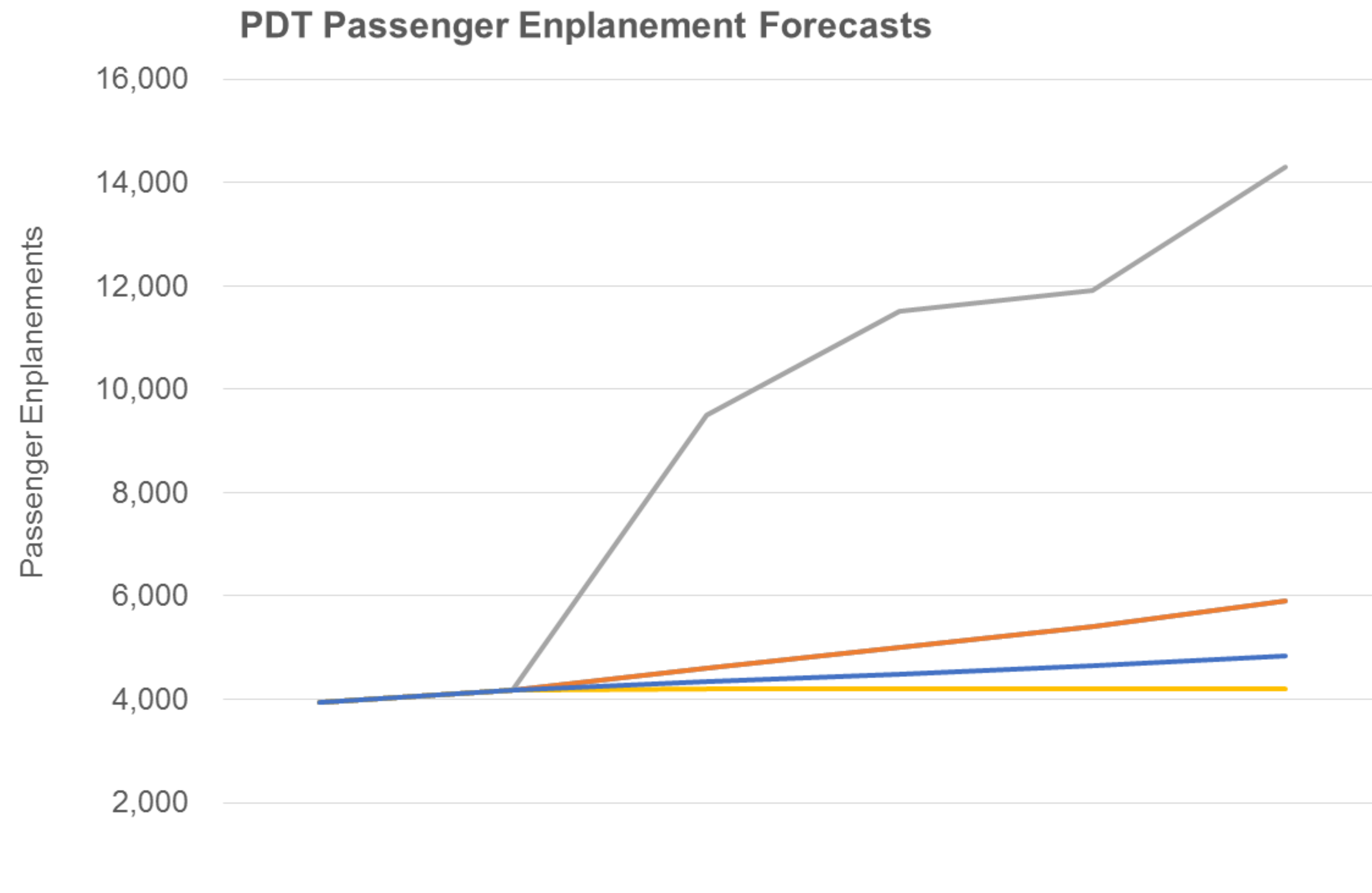
Table 6: Scenario 4A							
		2009	2014	2020	2025	2030	2035
Enplanements	Air Carrier	0	0	0	0	0	0
	Air Taxi	3,947	4,174	4,200	4,200	4,200	4,200
	Total	**3,947**	**4,147**	**4,200**	**4,200**	**4,200**	**4,200**
Operations	Air Carrier	94	6	0	0	0	0
	Passenger Air Taxi/Commuter	2,172	2,214	580	580	580	580
	Other Air Taxi/Commuter	1,952	1,599	1,990	2,090	2,180	2,290
	Total	**4,218**	**3,819**	**2,570**	**2,670**	**2,760**	**2,870**

Schedule air taxi/commuter forecasts look at how many operations would be needed to transport 4,200 enplanements at an 80 percent load factor – an industry benchmark. Scheduled air taxi/commuter operations forecasts of 580 operations indicate that service would likely operate once a day, and not every day. This would require travelers to overnight at their destination or find another way home, which reduces the appeal of the service. This may negatively impact passenger numbers which would reduce load factors.

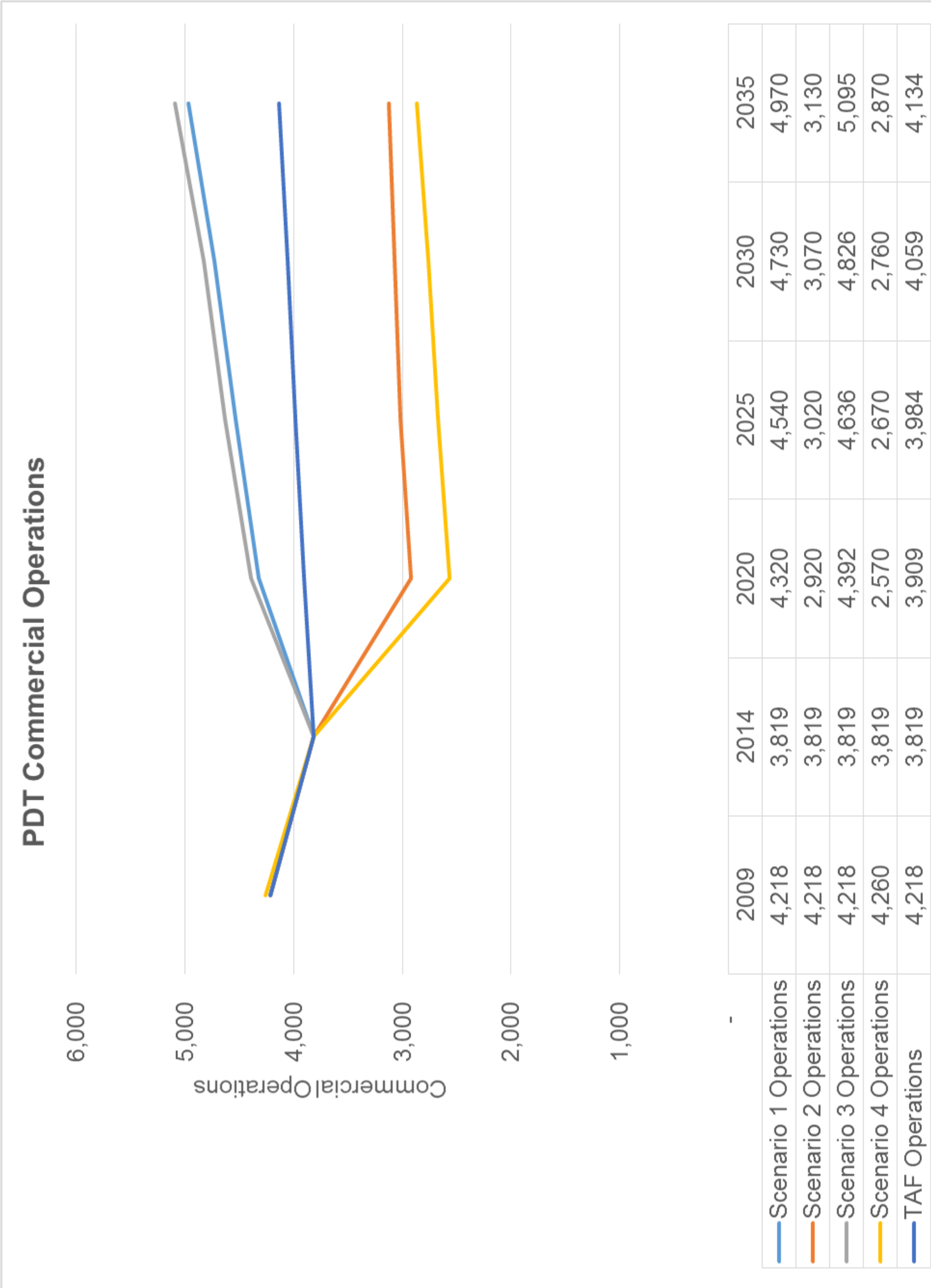
Scenario 4A enplanements are three percent below the TAF in 2020, seven percent below the TAF in 2025, and 10 percent above the TAF in 2035. Scenario 4A operations are 34 percent above the TAF in 2020, 33 percent above the TAF in 2025, and 31 percent above the TAF in 2035.

Reduced load factors would be compensated for by increasing ticket prices; however, the proximity of cheaper air service with a greater number of flight frequencies at PSC suggests that air service may be canceled entirely. A summary of what commercial operations would look like if scheduled air service were canceled is included in **Table 7**.

Table 7: Scenario 4B							
		2009	2014	2020	2025	2030	2035
Enplanements	**Total**	**3,947**	**4,147**	**0**	**0**	**0**	**0**
Operations	Air Carrier	94	6	0	0	0	0
	Passenger Air Taxi/Commuter	2,172	2,214	0	0	0	0
	Other Air Taxi/Commuter	1,952	1,599	1,990	2,090	2,180	2,290
	Total	**4,218**	**3,819**	**1,990**	**2,090**	**2,180**	**2,290**



	2009	2014	2020	2025	2030	2035
Scenario 1 Enplanements	3,947	4,174	4,600	5,000	5,400	5,900
Scenario 2 Enplanements	3,947	4,174	4,600	5,000	5,400	5,900
Scenario 3 Enplanements	3,947	4,174	9,500	11,500	11,900	14,300
Scenario 4 Enplanements	3,947	4,174	4,200	4,200	4,200	4,200
TAF Enplanements	3,947	4,174	4,346	4,497	4,660	4,829



	2009	2014	2020	2025	2030	2035
Scenario 1 Operations	4,218	3,819	4,320	4,540	4,730	4,970
Scenario 2 Operations	4,218	3,819	2,920	3,020	3,070	3,130
Scenario 3 Operations	4,218	3,819	4,392	4,636	4,826	5,095
Scenario 4 Operations	4,260	3,819	2,570	2,670	2,760	2,870
TAF Operations	4,218	3,819	3,909	3,984	4,059	4,134

Appendix C

DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION

CERTIFICATE OF WAIVER OR AUTHORIZATION

ISSUED TO

Oregon Army National Guard
1776 Militia Way
PO Box 14350
Salem, OR 97309-5047

This certificate is issued for the operations specifically described hereinafter. No person shall conduct any operation pursuant to the authority of this certificate except in accordance with the standard and special provisions contained in this certificate, and such other requirements of the Federal Aviation Regulations not specifically waived by this certificate.

OPERATIONS AUTHORIZED

Operation of the RQ-7B Shadow Unmanned Aircraft System (UAS) in Class D, E and G airspace near Pendleton, OR, at or below 4,000 feet Mean Sea Level (MSL) under the jurisdiction of East Oregon Regional Airport (PDT) Airport Traffic Control Tower (ATCT) and Pasco Terminal Radar Approach Control (TRACON).

LIST OF WAIVED REGULATIONS BY SECTION AND TITLE

N/A

STANDARD PROVISIONS

1. A copy of the application made for this certificate shall be attached and become a part hereof.
2. This certificate shall be presented for inspection upon the request of any authorized representative of the Federal Aviation Administration, or of any State or municipal official charged with the duty of enforcing local laws or regulations.
3. The holder of this certificate shall be responsible for the strict observance of the terms and provisions contained herein.
4. This certificate is nontransferable.

Note-This certificate constitutes a waiver of those Federal rules or regulations specifically referred to above. It does not constitute a waiver of any State law or local ordinance.

SPECIAL PROVISIONS

Special Provisions are set forth and attached.

This certificate 2012-WSA-105 is effective from May 6, 2013, to March 28, 2014, and is subject to cancellation at any time upon notice by the Administrator or his/her authorized representative. If an updated Airworthiness Release (AWR) is received prior to expiration, this COA may be extended to May 5, 2015, or the new AWR expiration, whichever is sooner.

BY DIRECTION OF THE ADMINISTRATOR

FAA Headquarters, AJV-115
(Region)

For: Douglas Gould
(Signature)

May 3, 2013
(Date)

Manager, UAS Tactical Operations Section
(Title)

FAA Form 7711-1 (7-74)

COA Number: 2012-WSA-105

Issued To: Oregon Army National Guard, referred herein as the "proponent"

Address: 1776 Militia Way
PO Box 14350
Salem, OR 97309-5047

Activity: Operation of the RQ-7B Shadow Unmanned Aircraft System (UAS) in Class D, E and G airspace near Pendleton, OR, at or below 4,000 feet Mean Sea Level (MSL) under the jurisdiction of East Oregon Regional Airport (PDT) Airport Traffic Control Tower (ATCT) and Pasco Terminal Radar Approach Control (TRACON). See attachment 1.

Purpose: To prescribe UAS operating requirements in the National Airspace System (NAS) for the purpose of training flights.

Dates of Use: This COA is valid from May 6, 2013, through March 28, 2014. If an updated Airworthiness Release (AWR) is received prior to expiration, this COA may be extended to May 5, 2015, or the new AWR expiration, whichever is sooner. Should a renewal become necessary, the proponent shall advise the Federal Aviation Administration (FAA), in writing, no later than 60 business days prior to the requested effective date.

Public Aircraft

1. A public aircraft operation is determined by statute, 49 USC §40102(a)(41) and §40125.
2. All public aircraft flights conducted under a COA must comply with the terms of the statute.
3. All flights must be conducted per the declarations submitted on COA on-line.

STANDARD PROVISIONS

A. General.

The review of this activity is based upon current understanding of UAS operations and their impact in the NAS. This COA will not be considered a precedent for future operations. (As changes in or understanding of the UAS industry occur, limitations and conditions for operations will be adjusted.)

All personnel connected with the UAS operation must read and comply with the contents of this authorization and its provisions.

A copy of the COA including the special limitations must be immediately available to all operational personnel at each operating location whenever UAS operations are being conducted.

This authorization may be canceled at any time by the Administrator, the person authorized to grant the authorization, or the representative designated to monitor a specific operation. As a general rule, this authorization may be canceled when it is no longer required, there is an abuse of its provisions, or when unforeseen safety factors develop. Failure to comply with the authorization is cause for cancellation. The proponent will receive written notice of cancellation.

During the time this COA is approved and active, a site safety evaluation/visit may be accomplished to ensure COA compliance, assess any adverse impact on ATC or airspace, and ensure this COA is not burdensome or ineffective. Deviations, accidents/incidents/mishaps, complaints, etc. will prompt a COA review or site visit to address the issue. Refusal to allow a site safety evaluation/visit may result in cancellation of the COA. Note: This section does not pertain to agencies that have other existing agreements in place with the FAA.

B. Airworthiness Certification.

The unmanned aircraft must be shown to be airworthy to conduct flight operations in the NAS. The Oregon Army National Guard has made its own determination that the Shadow unmanned aircraft is airworthy. The Shadow must be operated in strict compliance with all provisions and conditions contained in the Airworthiness Safety Release, including all documents and provisions referenced in the COA application.

1. A configuration control program must be in place for hardware and/or software changes made to the UAS to ensure continued airworthiness. If a new or revised Airworthiness Release is generated as a result of changes in the hardware or software affecting the operating characteristics of the UAS, notify the UAS Integration Office of the changes as soon as practical.

a. Software and hardware changes should be documented as part of the normal maintenance procedures. Software changes to the aircraft and control station as well as hardware system changes are classified as major changes unless the agency has a formal process, accepted by the FAA. These changes should be provided to the UAS Integration office in summary form at the time of incorporation.

b. Major modifications or changes, performed under the COA, or other authorizations that could potentially affect the safe operation of the system must be documented and provided to the FAA in the form of a new AWR, unless the agency has a formal process, accepted by the FAA.

c. All previously flight proven systems to include payloads, may be installed or removed as required, and that activity recorded in the unmanned aircraft and ground control stations logbooks by persons authorized to conduct UAS maintenance Describe any payload equipment configurations in the UAS logbook that will result in a weight and balance change, electrical loads, and or flight dynamics, unless the agency has a formal process, accepted by the FAA.

d. For unmanned aircraft system discrepancies, a record entry should be made by an appropriately rated person to document the finding in the logbook. No flights may be conducted following major changes, modifications or new installations unless the party responsible for certifying airworthiness has determined the system is safe to operate in the NAS and a new AWR is generated, unless the agency has a formal process, accepted by the FAA. The successful completion of these tests must be recorded in the appropriate logbook, unless the agency has a formal process, accepted by the FAA.

2. The Shadow must be operated in strict compliance with all provisions and conditions contained within the spectrum analysis assigned and authorized for use within the defined operations area.

3. All items contained in the application for equipment frequency allocation must be adhered to, including the assigned frequencies and antenna equipment characteristics. A ground operational check to verify the control station can communicate with the aircraft (frequency integration check) must be conducted prior to the launch of the unmanned aircraft to ensure any electromagnetic interference does not adversely affect control of the aircraft.

4. The use of a Traffic Collision Avoidance System (TCAS) in any mode while operating an unmanned aircraft is prohibited.

C. **Operations.**

1. Unless otherwise authorized as a special provision, a maximum of one unmanned aircraft will be controlled:
   a. In any defined operating area,

b. From a single control station, and
c. By one pilot at a time.

2. A Pilot-in-Command (PIC) is the person who has final authority and responsibility for the operation and safety of flight, has been designated as PIC before or during the flight, and holds the appropriate category, class, and type rating, if appropriate, for the conduct of the flight. The responsibility and authority of the PIC as described by 14 CFR 91.3, Responsibility and Authority of the Pilot-in-Command, apply to the unmanned aircraft PIC. The PIC position may rotate duties as necessary with equally qualified pilots. The individual designated as PIC may change during flight. **Note:** The PIC can only be the PIC for one aircraft at a time. For Optionally Piloted Aircraft (OPA), PIC must meet UAS guidance requirements for training, pilot licensing, and medical requirements when operating OPA as a UAS.

3. The PIC must conduct a pre-takeoff briefing as applicable prior to each launch. The briefing should include but is not limited to the
   a. Contents of the COA,
   b. Altitudes to be flown,
   c. Mission overview including handoff procedures,
   d. Frequencies to be used,
   e. Flight time, including reserve fuel requirements,
   f. Contingency procedures to include lost link, divert, and flight termination, and
   g. Hazards unique to the flight being flown.

Note: Flight Crew Member (UAS). In addition to the flight crew members identified in 14 CFR Part 1, Definitions and Abbreviations, an Unmanned Aircraft System flight crew members include pilots, sensor/payload operators, and visual observers and may include other persons as appropriate or required to ensure safe operation of the aircraft.

4. All operations will be conducted in compliance with Title 14 CFR Part 91. Special attention should be given to:
   a. § 91.3 Responsibility and authority of the pilot in command
   b. § 91.13 Careless or reckless operation
   c. § 91.17 Alcohol or drugs
   d. § 91.103 Preflight Actions
   e. § 91.111 Operating near other aircraft.
   f. § 91.113 Right-of-way rules: Except water operations
   g. § 91.115 Right-of-way rules: Water operations
   h. § 91.119 Minimum safe altitudes: General
   i. § 91.123 Compliance with ATC clearances and instructions.

j. § 91.133 Restricted and prohibited areas

k. § 91.137 Temporary flight restrictions in the vicinity of disaster/hazard areas

l. § 91.145 Management of aircraft operations in the vicinity of aerial demonstrations and major sporting events

m. § 91.151 Fuel requirements for flight in VFR conditions

n. § 91.155 Basic VFR weather minimums

o. § 91.159 VFR cruising altitude or flight level

p. § 91.209 Aircraft Lights

q. § 91.213 Inoperative instruments and equipment

r. § 91.215 ATC transponder and altitude reporting equipment and use

s. Appendix D to Part 91—Airports/Locations: Special Operating Restrictions

5. Unless otherwise authorized as a special provision, all operations must be conducted in visual meteorological conditions (VMC) during daylight hours in compliance with Title 14 of the Code of Federal Regulations (CFR) Part 91 §91.155 and the following:

6. Special Visual Flight Rules (VFR) operations are not authorized.

   a. VFR cloud clearances specified in 14 CFR Part 91 §91.155, must be maintained, except in Class G airspace where Class E airspace visibility requirements must be applied, but not less than 3 statute miles (SM) flight visibility and 1000' ceiling.

   b. Flights conducted under Instrument Flight Rules (IFR) in Class A airspace shall remain clear of clouds. NOTE: Deviations from IFR clearance necessary to comply with this provision must have prior ATC approval.

   c. Chase aircraft must maintain 5 NM flight visibility.

7. Night operations are prohibited unless otherwise authorized as a special provision.

8. Operations (including lost link procedures) must not be conducted over populated areas, heavily trafficked roads, or an open-air assembly of people.

D. **Air Traffic Control (ATC) Communications.**

1. The pilot and/or PIC will maintain direct, two-way communication with ATC and have the ability to maneuver the unmanned aircraft in response to ATC instructions, unless addressed in the Special Provision Section.

   a. When required, ATC will assign a radio frequency for air traffic control during flight. The use of land-line and/or cellular telephones is prohibited as the primary means for in-flight communication with ATC.

2. The PIC must not accept an ATC clearance requiring the use of visual separation, sequencing, or visual approach.

3. When necessary, transit of airways and routes must be conducted as expeditiously as possible. The unmanned aircraft must not loiter on Victor airways, jet routes, Q and T routes, IR routes, or VR routes.

4. For flights operating on an IFR clearance at or above 18,000 feet mean sea level (MSL), the PIC must ensure positional information in reference to established National Airspace System (NAS) fixes, NAVAIDs, and/or waypoints is provided to ATC. The use of latitude/longitude positions is not authorized, except oceanic flight operations.

5. If equipped, the unmanned aircraft must operate with
   a. An operational mode 3/A transponder with altitude encoding, or mode S transponder (preferred) set to an ATC assigned squawk
   b. Position/navigation and anti-collision lights on at all times during flight unless stipulated in the special provisions or the proponent has a specific exemption from 14 CFR Part 91.209.

6. Operations that use a Global Positioning System (GPS) for navigation must check Receiver Autonomous Integrity Monitoring (RAIM) notices prior to flight operations. Flight into a GPS test area or degraded RAIM is prohibited for those aircraft that use GPS as their sole means for navigation.

E. **Safety of Flight.**

1. The proponent or delegated representative is responsible for halting or canceling activity in the COA area if, at any time, the safety of persons or property on the ground or in the air is in jeopardy, or if there is a failure to comply with the terms or conditions of this authorization.

2. ATC must be immediately notified in the event of any emergency, loss and subsequent restoration of command link, loss of PIC or observer visual contact, or any other malfunction or occurrence that would impact safety or operations.

3. Sterile Cockpit Procedures.
   a. Critical phases of flight include all ground operations involving
      (1) Taxi (movement of an aircraft under its own power on the surface of an airport)
      (2) Take-off and landing (launch or recovery)
      (3) All other flight operations in which safety or mission accomplishment might be compromised by distractions
   b. No crewmember may perform any duties during a critical phase of flight not required for the safe operation of the aircraft.

c. No crewmember may engage in, nor may any PIC permit, any activity during a critical phase of flight which could

(1) Distract any crewmember from the performance of his/her duties or

(2) Interfere in any way with the proper conduct of those duties.

d. The pilot and/or the PIC must not engage in any activity not directly related to the operation of the aircraft. Activities include, but are not limited to, operating UAS sensors or other payload systems.

e. The use of cell phones or other electronic devices is restricted to communications pertinent to the operational control of the unmanned aircraft and any required communications with Air Traffic Control.

4. See-and-Avoid.
Unmanned aircraft have no on-board pilot to perform see-and-avoid responsibilities; therefore, when operating outside of active restricted and warning areas approved for aviation activities, provisions must be made to ensure an equivalent level of safety exists for unmanned operations. Adherence to 14 CFR Part 91 §91.111, §91.113 and §91.115, is required.

a. The proponent and/or delegated representatives are responsible at all times for collision avoidance with all aviation activities and the safety of persons or property on the surface with respect to the UAS.

b. UAS pilots will ensure there is a safe operating distance between aviation activities and unmanned aircraft at all times.

c. Any crew member responsible for performing see-and-avoid requirements for the UA must have and maintain instantaneous communication with the PIC.

d. UA operations will only be conducted within Reduced Vertical Separation Minimum (RVSM) altitudes, when appropriately equipped or having received a clearance under an FAA deviation. **NOTE:** UA operations should not plan on an en-route clearance in RVSM altitudes, without being RVSM equipped.

e. Visual observers must be used at all times except in Class A, airspace, active Restricted Areas, and Warning areas designated for aviation activities.

(1) Observers may either be ground-based or in a chase plane.

(2) If the chase aircraft is operating more than 100 feet above/below and/or more than ½ NM laterally of the unmanned aircraft, the chase aircraft PIC will advise the controlling ATC facility.

f. The PIC is responsible to ensure visual observers are;

(1) Able to see the aircraft and the surrounding airspace throughout the entire flight, and

(2) Able to provide the PIC with the UA's flight path, and proximity to all aviation activities and other hazards (e.g., terrain, weather, structures) sufficiently to exercise effective control of the UA to:

(a) Comply with CFR Parts 91.111, 91.113 and 91.115, and

(b) Prevent the UA from creating a collision hazard.

5. Observers must be able to communicate clearly to the pilot any instructions required to remain clear of conflicting traffic, using standard phraseology as listed in the Aeronautical Information Manual when practical.

6. A PIC may rotate duties as necessary to fulfill operational requirements; a PIC must be designated at all times.

7. Pilots flying chase aircraft must not concurrently perform observer or UA pilot duties.

8. Pilot and observers must not assume concurrent duties as both pilot and observer.

9. The required number of ground observers will be in place during flight operations.

10. The use of multiple successive observers (daisy chaining) is prohibited unless otherwise authorized as a special provision.

11. The dropping or spraying of aircraft stores, or carrying of hazardous materials (including ordnance) outside of active Restricted, Prohibited, or Warning Areas approved for aviation activities is prohibited unless specifically authorized as a special provision.

F. **Crewmember Requirements.**

1. All crewmembers associated with the operation of the unmanned aircraft, including chase operations, must be qualified or must be receiving formal training under the direct supervision of a qualified instructor, who has at all times, responsibility for the operation of the unmanned aircraft.

2. Pilots and observers must have an understanding of, and comply with, Title 14 Code of Federal Regulations, and/or agency directives and regulations, applicable to the airspace where the unmanned aircraft will operate.

3. Pilots, supplemental pilots, and observers must maintain a current second class (or higher) airman medical certificate that has been issued under 14 CFR Part 67, or an FAA accepted agency equivalent based on the application.

4. At a minimum, the use of alcohol and/or drugs in violation of 14 CFR Part 91 §91.17 applies to UA pilots and observers.

5. At a minimum, observers must receive training on rules and responsibilities described in 14 CFR Part 91 §91.111. §91.113 and §91.115, regarding cloud clearance, flight visibility, and the pilot controller glossary, including standard ATC phraseology and communication.

6. Recent Pilot Experience (Currency). The proponent must provide documentation, upon request, showing the pilot/supplemental pilot/PIC maintains an appropriate level of recent pilot experience in either the UAS being operated or in a certified simulator. At a minimum, he/she must conduct three takeoffs (launch) and three landings (recovery) in the specific UAS within the previous 90 days (excluding pilots who do not conduct launch/recovery during normal/emergency operations). If a supplemental pilot assumes the role of PIC, he/she must comply with PIC rating requirements.

7. A PIC and/or supplemental pilot have the ability to assume the duties of an internal or an external UAS pilot at any point during the flight.

8. A PIC may be augmented by supplemental pilots.

9. PIC Ratings.
   Rating requirements for the UAS PIC depend on the type of operation conducted. The requirement for the PIC to hold, at a minimum, a current FAA private pilot certificate or the FAA accepted agency equivalent, based on the application of 14 CFR Part 61, is predicated on various factors including the location of the planned operations, mission profile, size of the unmanned aircraft, and whether or not the operation is conducted within or beyond visual line-of-sight.

   a. The PIC must hold, at a minimum, a current FAA private pilot certificate or the FAA accepted agency equivalent, based on the application or 14 CFR Part 61.under all operations:

      (1) Approved for flight in Class A, B, C, D, E, and G (more than 400 feet above ground level (AGL)) airspace

      (2) Conducted under IFR (FAA instrument rating required, or the FAA accepted agency equivalent, based on the application or 14 CFR Part 61

      (3) Approved for night operations

      (4) Conducted at or within 5 NM of a joint use or public airfields

      (5) Requiring a chase aircraft

      (6) At any time the FAA has determined the need based on the UAS characteristics, mission profile, or other operational parameters

   b. Operations without a pilot certificate may be allowed when all of the following conditions are met:

      (1) The PIC has successfully completed, at a minimum, FAA private pilot ground instruction and passed the written examination, or the FAA accepted agency equivalent, based on the application. Airman Test reports are valid for the 24-

calendar month period preceding the month the exam was completed, at which time the instruction and written examination must be repeated.

(2) Operations are during daylight hours.

(3) The operation is conducted in a sparsely populated location.

(4) The operation is conducted from a privately owned airfield, military installation, or off-airport location.

(5) Operations are approved and conducted solely within visual line-of-sight in Class G airspace.

(6) Visual line-of-sight operations are conducted at an altitude of no more than 400 feet Above Ground Level (AGL) in class G airspace at all times.

c. The FAA may require specific aircraft category and class ratings in manned aircraft depending on the UAS seeking approval and the characteristics of its flight controls interface.

10. PIC Recent Flight Experience (Currency).

a. For those operations that require a certificated pilot or FAA accepted agency equivalent, based on the application, the PIC must have flight reviews 14 CFR Part 61.56, and if the pilot conducts takeoff, launch, landing or recovery the PIC must maintain recent pilot experience in manned aircraft per 14 CFR Part 61.57,; Recent Flight Experience: Pilot in Command. .

b. For operations approved for night or IFR through special provisions, the PIC must maintain minimum recent pilot experience per 14 CFR Part 61.57, Recent Flight Experience: Pilot in Command, as applicable.

11. Supplemental Pilot Ratings.

a. Supplemental pilots must have, at a minimum, successfully completed private pilot ground school and passed the written test or the FAA accepted agency equivalent, based on the application. The ground school written test results are valid for two years from the date of completion, at which time the instruction and written examination must be repeated. If a supplemental pilot assumes the role of PIC, he/she must comply with PIC rating, currency, medical, and training requirements listed in this document.

12. Ancillary personnel such as systems operators or mission specialists must be thoroughly familiar with and possess operational experience of the equipment being used. If the systems being used are for observation and detection of other aircraft for collision avoidance purposes, personnel must be thoroughly trained on collision avoidance procedures and techniques and have direct communication with the UAS pilot, observer, and other crewmembers.

13. The Agency will ensure that Crew Resource Management (CRM) training is current for all crew members before flying operational or training missions. The CRM program

must consist of initial training, as well as CRM recurrent training during every recurrent training cycle, not to exceed a 12 month interval between initial training and recurrent training or between subsequent recurrent training sessions.

G. **Notice to Airmen (NOTAM).**

1. A distance (D) NOTAM must be issued when unmanned aircraft operations are being conducted. This requirement may be accomplished
   a. Through the proponent's local base operations or NOTAM issuing authority, or
   b. By contacting the NOTAM Flight Service Station at 1-877-4-US-NTMS (1-877-487-6867) not more than 72 hours in advance, but not less than 48 hours prior to the operation, unless otherwise authorized as a special provision. The issuing agency will require the:
      (1) Name and address of the pilot filing the NOTAM request
      (2) Location, altitude, or operating area
      (3) Time and nature of the activity.

2. For proponents filing their NOTAM with the Department of Defense: The requirement to file with an Automated Flight Service Station (AFSS) is in addition to any local procedures/requirements for filing through the Defense Internet NOTAM Service (DINS).

H. **Data Reporting.**

1. Documentation of all operations associated with UAS activities is required regardless of the airspace in which the UAS operates. This requirement includes COA operations within Special Use airspace. NOTE: Negative (zero flights) reports are required.

2. The proponent must submit the following information through UAS COA On-Line on a monthly basis:
   a. The number of flights conducted under this COA. (A flight during which any portion is conducted in the NAS must be counted only once, regardless of how many times it may enter and leave Special Use airspace between takeoff and landing)
   b. Aircraft operational hours per flight
   c. Ground control station operational hours in support of each flight, to include Launch and Recovery Element (LRE) operations
   d. Pilot duty time per flight
   e. Equipment malfunctions (hardware/software) affecting either the aircraft or ground control station
   f. Deviations from ATC instructions and/or Letters of Agreement/Procedures
   g. Operational/coordination issues

h. The number and duration of lost link events (control, vehicle performance and health monitoring, or communications) per aircraft per flight.

I. **Incident/Accident/Mishap Reporting.**

Immediately after an incident or accident, and before additional flight under this COA, the proponent must provide initial notification of the following to the FAA via the UAS COA On-Line forms (Incident/Accident).

1. All accidents/mishaps involving UAS operations where any of the following occurs:
   a. Fatal injury, where the operation of a UAS results in a death occurring within 30 days of the accident/mishap
   b. Serious injury, where the operation of a UAS results in a hospitalization of more than 48 hours, the fracture of any bone (except for simple fractures of fingers, toes, or nose), severe hemorrhage or tissue damage, internal injuries, or second or third-degree burns
   c. Total unmanned aircraft loss
   d. Substantial damage to the unmanned aircraft system where there is damage to the airframe, power plant, or onboard systems that must be repaired prior to further flight
   e. Damage to property, other than the unmanned aircraft.

2. Any incident/mishap that results in an unsafe/abnormal operation including but not limited to
   a. A malfunction or failure of the unmanned aircraft's on-board flight control system (including navigation)
   b. A malfunction or failure of ground control station flight control hardware or software (other than loss of control link)
   c. A power plant failure or malfunction
   d. An in-flight fire
   e. An aircraft collision
   f. Any in-flight failure of the unmanned aircraft's electrical system requiring use of alternate or emergency power to complete the flight
   g. A deviation from any provision contained in the COA
   h. A deviation from an ATC clearance and/or Letter(s) of Agreement/Procedures
   i. A lost control link event resulting in
      (1) Fly-away, or
      (2) Execution of a pre-planned/unplanned lost link procedure.

3. Initial reports must contain the information identified in the COA On-Line Accident/Incident Report.

4. Follow-on reports describing the accident/incident/mishap(s) must be submitted by providing copies of proponent aviation accident/incident reports upon completion of safety investigations. Such reports must be limited to factual information only where privileged safety or law enforcement information is included in the final report.

5. Public-use agencies other than those which are part of the Department of Defense are advised that the above procedures are not a substitute for separate accident/incident reporting required by the National Transportation Safety Board under 49 CFR Part 830 §830.5.

6. This COA is issued with the provision that the FAA be permitted involvement in the proponent's incident/accident/mishap investigation as prescribed by FAA Order 8020.11, Aircraft Accident and Incident Notification, Investigation, and Reporting.

FLIGHT STANDARDS SPECIAL PROVISIONS

A. Contingency Planning

1. **Point Identification**. The proponent must submit contingency plans that address emergency recovery or flight termination of the unmanned aircraft (UA) in the event of unrecoverable system failure. These procedures will normally include Lost Link Points (LLP), Divert/Contingency Points (DCP) and Flight Termination Points (FTP) for each operation. LLPs and DCPs must be submitted in latitude/longitude (Lat/Long) format along with a graphic representation plotted on an aviation sectional chart (or similar format). FTPs or other accepted contingency planning measures must also be submitted in latitude/longitude (Lat/Long) format along with a graphic representation plotted on an aviation sectional chart, or other graphic representation acceptable to the FAA. The FAA accepts the LLPs, DCPs, FTPs, and other contingency planning measures, submitted by the proponent but does not approve them. When conditions preclude the use of FTPs, the proponent must submit other contingency planning options for consideration and approval. At least one LLP, DCP, and FTP (or an acceptable alternative contingency planning measure) is required for each operation. The proponent must furnish this data with the initial COA application. Any subsequent changes or modifications to this data must be provided to AJV-13 for review and consideration no later than 30 days prior to proposed flight operations.

2. **Risk Mitigation Plans**. For all operations, the proponent must develop detailed plans to mitigate the risk of collision with other aircraft and the risk posed to persons and property on the ground in the event the UAS encounters a lost link, needs to divert, or the flight needs to be terminated. The proponent must take into consideration all airspace constructs and minimize risk to other aircraft by avoiding published airways, military training routes, NAVAIDs, and congested areas. In the event of a contingency divert or flight termination, the use of a chase aircraft is preferred when the UAS is operated

outside of Restricted or Warning Areas. If time permits, the proponent should make every attempt to utilize a chase aircraft to monitor the aircraft to a DCP or to the FTP. In the event of a contingency divert or flight termination, the proponent will operate in Class A airspace and Special Use airspace to the maximum extent possible to reduce the risk of collision with non-participating air traffic.

a. **LLP Procedures.**

(1) LLPs are defined as a point, or sequence of points where the aircraft will proceed and hold at a specified altitude, for a specified period of time, in the event the command and control link to the aircraft is lost. The aircraft will autonomously hold, or loiter, at the LLP until the communication link with the aircraft is restored or the specified time elapses. If the time period elapses, the aircraft may autoland, proceed to another LLP in an attempt to regain the communication link, or proceed to an FTP for flight termination. LLPs may be used as FTPs. In this case, the aircraft may loiter at the LLP/FTP until link is re-established or fuel exhaustion occurs.

(2) For areas where multiple or concurrent UAS operations are authorized in the same operational area, a segregation plan must be in place in the event of a simultaneous lost link scenario. The segregation plan may include altitude offsets and horizontal separation by using independent LLPs whenever possible.

b. **DCP Procedures.**

(1) A DCP is defined as an alternate landing/recovery site to be used in the event of an abnormal condition that requires a precautionary landing. Each DCP must incorporate the means of communication with ATC throughout the descent and landing (unless otherwise specified in the Special Provisions) as well as a plan for ground operations and securing/parking the aircraft on the ground. This includes the availability of ground control stations capable of launch/recovery, communication equipment, and an adequate power source to operate all required equipment.

(2) For local operations, the DCP specified will normally be the airport/facility used for launch and recovery; however, the proponent may specify additional DCPs as alternates.

(3) For transit and/or mission operations that are being conducted in Class A airspace or Class E airspace above flight level (FL)-600, DCPs will be identified during the flight to be no further than one hour of flight time at any given time, taking into consideration altitude, winds, fuel consumption, and other factors. If it is not possible to define DCPs along the entire flight plan route, the proponent must identify qualified FTPs along the entire route and be prepared to execute flight termination at one of the specified FTPs if a return to base (RTB) is not possible.

(4) It is preferred that specified DCPs are non-joint use military airfields, other government-owned airfields, or private-use airfields. However, the proponent may designate any suitable airfield for review and consideration.

c. **Flight Termination Procedures.**

(1) Flight termination is the intentional and deliberate process of performing controlled flight into terrain (CFIT). Flight termination must be executed in the event that all contingencies have been exhausted and further flight of the aircraft cannot be safely achieved or other potential hazards exist that require immediate discontinuation of flight. FTPs or alternative contingency planning measures must be located within power off glide distance of the aircraft during all phases of flight and must be submitted for review and acceptance. The proponent must ensure sufficient FTPs or other contingency plan measures are defined to accommodate flight termination at any given point along the route of flight. The location of these points is based on the assumption of an unrecoverable system failure and must take into consideration altitude, winds, and other factors.

(2) Unless otherwise authorized, FTPs must be located in sparsely populated areas. Except for on- or near-airport operations, FTPs will be located no closer than five nautical miles from any airport, heliport, airfield, NAVAID, airway, populated area, major roadway, oil rig, power plant, or any other infrastructure. For offshore locations, the proponent must refer to appropriate United States Coast Guard (USCG) charts and other publications to avoid maritime obstructions, shipping lanes, and other hazards. Populated areas are defined as those areas depicted in yellow on a VFR sectional chart or as determined from other sources.

(a) It is preferred that flight termination occurs in Restricted or Warning Areas, government-owned land, or offshore locations that are restricted from routine civil use. However, the proponent may designate any suitable location for review and consideration.

(b) The proponent is required to survey all designated areas prior to their use as an FTP. All FTPs will be reviewed for suitability on a routine and periodic basis, not to exceed six months. The proponent assumes full risk and all liability associated with the selection and use of any designated FTP.

(c) It is desirable that the proponent receive prior permission from the land owner or using agency prior to the use of this area as an FTP. The proponent should clearly communicate the purpose and intent of the FTP.

(d) For each FTP, plans must incorporate the means of communication with ATC throughout the descent as well as a plan for retrieval/recovery of the aircraft.

(e) Contingency planning must take into consideration all airspace constructs and minimize risk to other aircraft by avoiding published airways, military training routes, NAVAIDs, and congested areas to the maximum extent possible.

(f) In the event of a contingency divert or flight termination, if time permits, the use of a chase aircraft is preferred when the UA is operated outside of Restricted or Warning Areas.

(g) In the event of a contingency divert or flight termination or other approved contingency measures, the proponent will operate in Class A airspace and Special Use airspace to the maximum extent possible to reduce the risk of collision with non-participating air traffic.

B. **Night Operation Limitations.**

Night operations are not authorized. UAS night operations are those operations that occur between the end of evening civil twilight and the beginning of morning civil twilight, as published in the American Air Almanac, converted to local time. (Note: this is equal to approximately 30 minutes after sunset until 30 minutes before sunrise).

C. Ensure PDT Tower is open and operational during all flight operations.

AIR TRAFFIC CONTROL SPECIAL PROVISIONS

A. **Coordination Requirements.**

Proponent must notify Eastern Oregon Regional ATCT at (541) 278-1993 no later than 24 hours prior to UA flight operations.

B. **Procedural Requirements.**

1. UAS operations must be conducted per the Letter of Agreement between East Oregon Regional Airport ATCT, Pasco TRACON, and the Oregon National Guard dated April 15, 2013 (Attachment 2).
2. Shadow operations will be divided into 3 approved zones.

   a. Inside PDT Class D:

      1) Altitude: at or below 4,000 ft MSL (as assigned by PDT ATCT)
      2) UA operations allowed with clearance from PDT ATCT.
      3) NW, NE and SW Holding Points (as depicted in Attachment 1) will be used as directed by PDT ATCT. Holding altitude: 3,500 MSL or as assigned.

   b. Operations in North OPAREA outside of Class D airspace:

      1) Altitude: at or below 4,000 ft MSL (as assigned by Pasco TRACON)
      2) Communications will be with PDT ATCT.

   c. Operations between PDT Class D and R -5701:

      1) Altitude: at or below 4,000 ft MSL (as assigned by Pasco TRACON)
      2) Communications will be with PDT ATCT.

3. The mixing of manned and unmanned traffic within Class D airspace during launch and recovery operations is prohibited.

C. Emergency/Contingency Procedures.

Lost Link Procedures:

In the event of a lost link, the UAS pilot will immediately notify PDT ATCT via radio or phone (541) 278-1993 if in transit to/from R-5701 or operating in North OPAREA, state pilot intentions, and comply with the following provisions:

a. Within Class D: Proceed to the Lost Link holding point inside the North OPAREA (depicted in Red) at an altitude of 3,500 ft MSL. The UA will orbit at this location until link is re-established or until the UA's parachute deploys.

b. In North OPAREA: Proceed to designated Lost Link holding point and orbit at 3,500 ft MSL until link is re-established or until the UA's parachute deploys.

c. Operations between PDT Class D and R-5701: Regardless of direction, Shadow will proceed to R-5701 and remain until link is re-established or until the UA's parachute deploys. If Lost Link occurs eastbound once reaching point W-1, the UA will proceed to Lost Link holding point inside the North OPAREA (depicted in Red) at an altitude of 3,500 ft MSL. The UA will orbit at this location until link is re-established or until the UA's parachute deploys.

d. If lost link occurs within a restricted or warning area, or the lost link procedure above takes the UA into the restricted or warning area – the aircraft will not exit the restricted or warning areas until the link is re-established.

e. The unmanned aircraft lost link mission will not transit or orbit over populated areas.

f. Lost link programmed procedures will avoid unexpected turn-around and/or altitude changes and will provide sufficient time to communicate and coordinate with ATC.

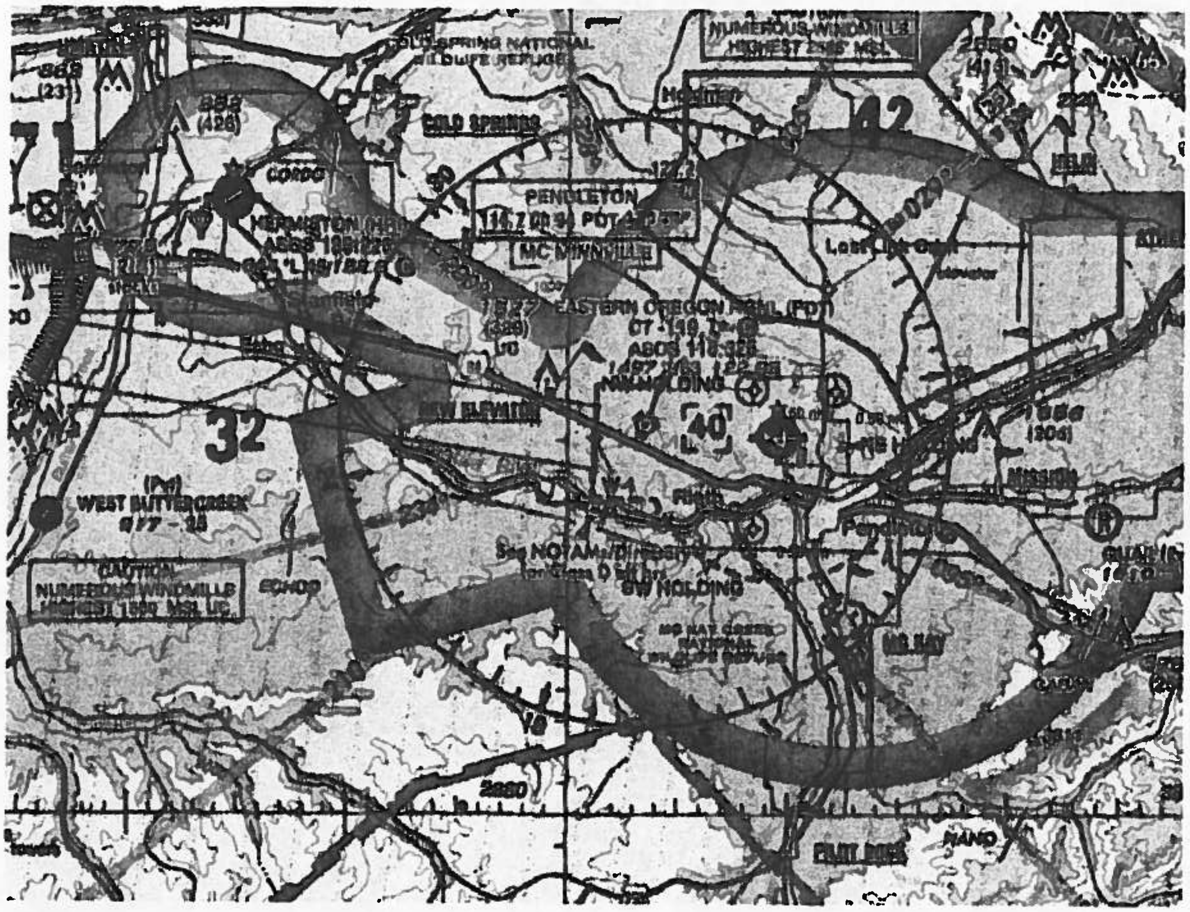
g. Lost link orbit points shall not coincide with the centerline of Victor airways.

AUTHORIZATION

This Certificate of Waiver or Authorization does not, in itself, waive any Title 14 Code of Federal Regulations, nor any state law or local ordinance. Should the proposed operation conflict with any state law or local ordinance, or require permission of local authorities or property owners, it is the responsibility of the Oregon Army National Guard to resolve the matter. This COA does not authorize flight within Special Use airspace without approval from the using agency. The Oregon Army National Guard is hereby authorized to operate the Shadow Unmanned Aircraft System in the operations area depicted in the Activity section of this attachment.

Attachment 1
(Page 1 of 2)

Operating Area



Northern OPAREA – Altitude: at or below 4,000 ft MSL (as assigned by Chinook Approach)

Point 1	N 45°45'52.00"	W 118°51'27.98"
Point 2	N 45°45'38.49"	W 118°48'28.71"
Point 3	N 45°44'40.79"	W 118°46'09.86"
Point 4	N 45°42'58.90"	W 118°44'41.98"
Point 5	N 45°46'03.05"	W 118°34'54.95"
Point 6	N 45°49'05.96"	W 118°34'54.95"
Point 7	N 45°50'38.04"	W 118°40'07.80"
Point 8	N 45°53'38.50"	W 118°43'56.29"
Point 9	N 45°53'38.50"	W 118°54'41.32"
Point 10	N 45°51'07.50"	W 118°54'41.32"
Point 11	N 45°48'50.00"	W 118°56'53.14"

Attachment 1
(Page 2 of 2)

West Transit Area - Altitude: at or below 4,000 ft MSL (as assigned by Chinook Approach)

Point 12	N 45°45'37.35"	W 119°22'40.50"
Point 13	N 45°43'46.01"	W 119°24'05.64"
Point 14	N 45°40'59.00"	W 118°58'45.87"
Point 15	N 45°43'00.46"	W 118°58'40.44"

Lost Link Orbit	N 45°46'46.00"	W 118°48'11.00"

Lost Link Altitude: 3,500 ft MSL

NW Holding	N 45°43'32.00"	W 118°51'33.00"
NE Holding	N 45°43'30.00"	W 118°47'49.00"
SW Holding	N 45°39'05.00"	W 118°51'33.00"
W-1	N 45°41'59.49"	W 118°58'45.57"
W-2	N 45°44'41.63"	W 119°23'23.50"

Pendleton Air Traffic Control Tower (ATCT), Pasco/Tri-Cities Terminal Approach Control (TRACON), Eastern Oregon Regional Airport, Oregon Army Support Facility #2, and Oregon State Army Aviation Office

LETTER OF AGREEMENT

EFFECTIVE: 5/8/2013

SUBJECT: Unmanned Aircraft Systems (UAS) operations at the Eastern Oregon Regional Airport (PDT) Class D Airspace

1. PURPOSE: To establish procedures for the operations of a RQ-7 Shadow UAS within PDT Class D airspace and the Class E airspace below 4,000 feet Mean Sea Level (MSL) between the western boundary of the PDT Class D airspace and the boundary of R5701.

2. SCOPE: The procedures herein apply to PDT Air Traffic Control Tower (ATCT), Pasco/Tri-Cities (PSC) Terminal Approach Control (TRACON) and Oregon Army National Guard.

3. RESPONSIBLITIES: Parties of this Letter of Agreement (LOA) must ensure their respective parties comply with its provisions.

4. PROCEDURES:

a. Scheduling:

(1) Oregon National Guard UAS operators must submit a request for issuance of a Notice to Airman (NOTAM) no later than 48 hours prior to UAS flight within PDT Class D airspace.

(2) A current LOA and FAA 7711-1 on file with PDT ATCT and PDT Airport Operations are the prerequisite for NOTAM consideration.

(3) Oregon Army Support Facility #2 must de-conflict UAS and Chinook helicopter local area flight schedules. Only one UAS at a time can operate in PDT Class D airspace. PDT ATCT will not be involved with de-confliction of proposed flight schedules.

(4) UAS operations must only occur when PDT Class D is in effect. UAS launch activity is prohibited within two hours of PDT ATCT closing.

(5) Weather minimum must be greater than 5,000 feet ceilings and 5 miles visibility.

b. General:

(1) Operators must comply with all Air Traffic Control (ATC) instructions/clearances.

(2) Segregation of unmanned and manned aircraft may be accomplished by the use of altitude restrictions, segregated visual holding points with specific lateral and vertical limits, ground observers, or other instructions as assigned by ATC in accordance with FAAO 7110.65, "*Air Traffic Control*".

(3) All PDT Class D UAS operations will be conducted within the area defined in the Certificate of Authorization (COA). UAS must operate at or below 4,000 MSL while in

Pendleton Air Traffic Control Tower (ATCT), Pasco/Tri-Cities Terminal Approach Control (TRACON), Eastern Oregon Regional Airport, Oregon Army Support Facility #2, and Oregon State Army Aviation Office

PDT Class D. UAS must not over fly populated areas, per Army directives. There are 3 holding points that PDT ATCT can utilize to de-conflict UAS and manned aircraft when there is IFR/VFR traffic in bound/out bound to/from PDT.

(4) It is the responsibility of the Pilot in Command (PIC) or Mission Coordinator (MC) to ensure that PDT ATCT is informed of completion of UAS operations.

(5) PDT ATCT will advise PSC of daily completion of UAS operations.

(6) All flight communications for launch and recovery at PDT or PDT Class D airspace must be accomplished on PDT ATCT assigned frequencies.

(7) The UAS must squawk 1200 at all times.

(8) PDT ATCT must advise PSC when UAS is airborne, when the UAS departs from or returns to PDT Class D airspace, and when the UAS enters or departs R-5701.

(9) Taxiway F will be utilized for UAS launch and recovery operations. Other taxiways, with proper coordination, can be utilized, but only with PDT ATCT consent.

(10) UAS must operate with position lights, anti-collision lights and a transponder at all times while in operation.

(11) A chase aircraft with dedicated visual observer is required while operating outside of PDT Class D airspace.

(12) PIC must maintain two-way radio communication with PDT ATCT at all times except when the UAS is operating in R-5701.

(13) In the event voice communication between PIC and ATC are lost, ATC must be notified immediately via recorded telephone line. The UAS can continue to operate as originally cleared, as long as an acceptable alternate direct two-way communications are maintained between ATC and the PIC. ATC may terminate operations if the alternate communication method becomes unmanageable and detracts from the safety of operations.

(14) Ground observers and or chase aircraft must maintain visual contact with the UAS during all phases of flight. If the ground observers lose sight of the UAS while in operation, the following procedures must be employed. Ground observers must communicate directly to the PIC that visual contact has been lost and that attempts to regain visual observation are being employed.

(15) Subsequently, the PIC must contact PDT ATCT to inform them that visual contact has been lost and that the UAS will orbit over the operating site, until visual contact can be reestablished. If visual contact is not re-acquired within 2 minutes, the PIC must fly the UAS to the "HOME" waypoint and land.

Pendleton Air Traffic Control Tower (ATCT), Pasco/Tri-Cities Terminal Approach Control (TRACON), Eastern Oregon Regional Airport, Oregon Army Support Facility #2, and Oregon State Army Aviation Office

(16) Once visual contact of the UAS has been reestablished, the observer must inform the PIC that visual contact has been reestablished. The PIC must then inform PDT ATCT that visual contact has been reestablished.

(17) In the event of an UAS emergency, the PIC must contact PDT ATCT immediately and advise them of the situation and intentions. Manned aircraft emergencies must take priority over unmanned aircraft emergencies. The UAS PIC must comply with all ATC instructions to accommodate the manned emergency.

c. Lost Link Procedures

(1) In the event of lost link between UAS and PIC while in PDT Class D airspace, UAS will proceed to the lost link holding fix inside the North OPAREA airspace at an altitude of 3,500 MSL. PDT ATCT must contact PSC and advise them of the situation. UAS will orbit the lost link fix until link is re-established or until UAS parachute deploys.

(2) In the event of lost link between UAS and PIC while proceeding to/from R5701 and PDT Class D airspace and regardless of direction, UAS will proceed to R5701 and remain until link is re-established or UAS parachute deploys. If lost link occurs eastbound and UAS has reached W1, UAS will proceed to lost link holding fix located in the North OPAREA at an altitude of 3,500 MSL. PDT ATCT must contact PSC and advise them of the situation. UAS will orbit the lost link fix until link is re-established or until UAS parachute deploys.

d. Safety: If a situation arises during UAS operations that has or might cause an unsafe situation in the NAS, UAS operations will be temporarily terminated. Parties of this agreement will convene at once to discuss the situation and seek solutions to ensure the safety of manned and unmanned flight.

Steve Jorgensen
Air Traffic Manager
East Oregon Regional ATCT

Kurtis J. Proctor
Air Traffic Manager
Pasco/Tri-Cities Chinook TRACON

Pendleton Air Traffic Control Tower (ATCT), Pasco Tri-Cities Terminal Approach Control (TRACON), Eastern Oregon Regional Airport, Oregon Army Support Facility #2, and Oregon State Army Aviation Office

Wayne Green
Airfield Manager
Eastern Oregon Regional Airport

Alan Gronewold, Lt Col, USAR
Commander
Oregon Army Support Facility #2

Heather Leonard
Terminal District Manager
Northwest District

Appendix D

Environmental Overview

Preliminary Report

Eastern Oregon Regional Airport

Pendleton, Oregon

Report prepared by

Mead & Hunt

www.meadhunt.com

January 22, 2016

Table of Contents

Introduction

The Environmental Overview is a preliminary review of the Airport's key environmental characteristics and physical resources. This effort is intended to provide awareness and to assist with the avoidance and minimization of environmental factors associated with Airport development actions contemplated throughout the planning study. This overview also identifies considerations that may require more detailed screening and documentation as part of subsequent project analysis, approval, funding, and permitting.

Methodology

The environmental study area is confined to the Airport's property boundary and immediate vicinity. Environmental conditions have largely been collected through the due diligence research of past studies, recorded Airport/City documents, permitting agency database searches, local inquiry, and with minor on-site field investigation and limited agency coordination. This effort does not include or constitute a formal biological/habitat assessment, archeological survey, determinations of historical or cultural significance, wetland delineation, or wildlife hazard assessment.

The following environmental categories are included in the overview analysis:

- Construction Impacts;
- Section 4(f) Properties;
- Compatible Land Use;
- Noise;
- Air Quality;
- Farmland/Soils;
- Threatened and Endangered Species;
- Wildlife;
- Wild and Scenic Rivers;
- Floodplains;
- Water Features and Quality;
- Wetlands; and
- Hazardous Materials, Pollution Prevention, and Solid Waste
- Cultural Resources

Environmental Categories

Construction Impacts

Background: Construction activities most commonly entail soil erosion, water quality, equipment noise, air/dust pollution, and solid waste considerations. FAA Advisory Circular 150/5370-10, "*Standards for Specifying Construction of Airports"* in conjunction with the FAA Standard Operating Procedure (SOP 1.0), "*FAA Evaluation of Sponsor's Construction Safety and Phasing Plans Funded by the AIP or PFC Programs*" specifies guidance incorporated into project design specifications to minimize and mitigate construction impacts.

Findings: Airport capital development projects typically are localized disturbances with short duration construction periods; typically less than three months. Closures are kept to a minimum to minimize inconvenience to Airport users. As required by the FAA, Airport construction projects undertaken will identify, as part of the preliminary engineering and design effort, environmental impacts, permitting requirements, and methods and techniques to reduce environmental consequences. Moreover, construction activities will minimize potential impacts through the implementation of best management practices, adherence to agency regulations, and conformance with local, state, and federal regulations imposed during the project.

Section 4(f) Properties

Background: Section 4(f) of the Department of Transportation Act provides that the Secretary of Transportation "will not approve any program or project that requires the use of any publicly owned land from a public park, recreation area, or wildlife and waterfowl refuge of national, state, or local significance or land from a historic site of national, state, or local significance as determined by the officials having jurisdiction, thereof, unless there is no feasible and prudent alternative to the use of such land and such program, and the project includes all possible planning to minimize harm resulting from the use." Section 4(f) properties include publicly owned public parks, recreation areas, waterfowl refuges, and any publicly or privately owned historic site listed or eligible for listing on the National Register of Historic Places (NRHP).

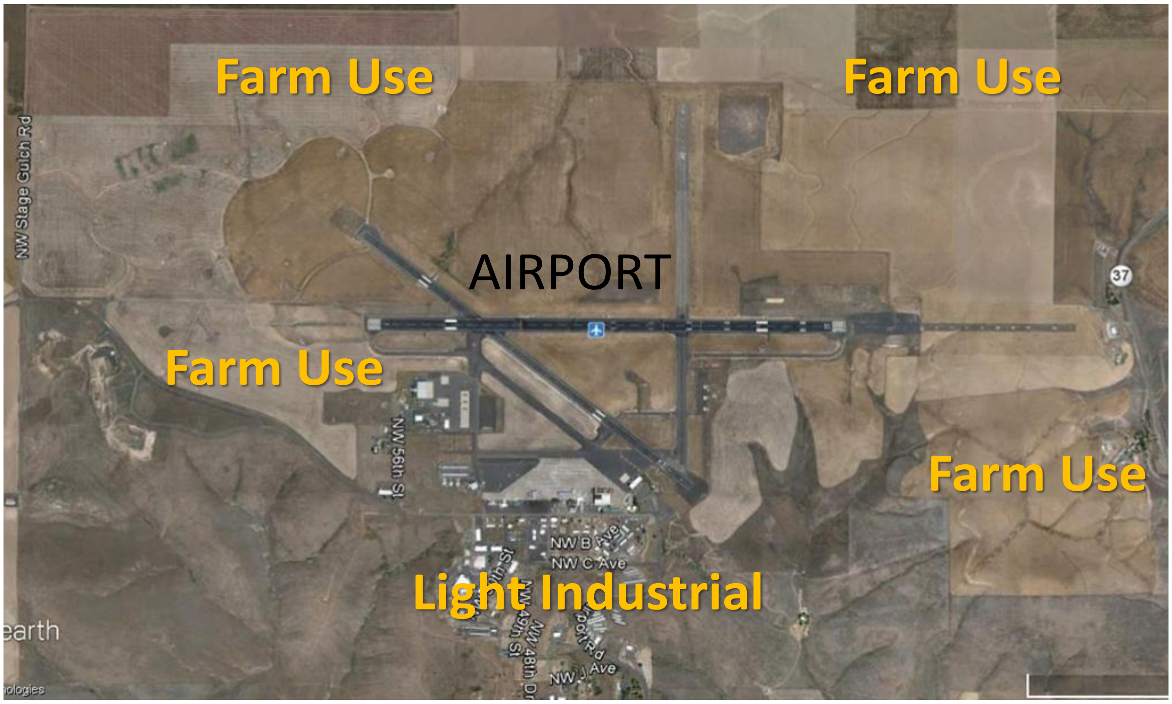
Findings: Information on Section 4(f) properties in the Airport vicinity was obtained from the Walla Walla County Comprehensive Plan, the National Register of Historic Places (NRHP) public spatial dataset, and aerial photography. The existing Airport does not contain any known Section 4(f) properties. The nearest Section 4(f) property is Pendair Park, located 2,000 feet south of the Airport. The nearest NRHP registered site is the Lodema House, located 2.5 miles southeast of the Airport.

Compatible Land Use

Background: Compatible land use involves the protection of Airport land uses and property interests as conforming to local, state, and federal guidelines and regulations, as necessary to comply with FAA compliances and assurances. The Airport is within the City of Pendleton City corporate limits, approximately 2.5 miles northwest of the downtown area. The Airport property totals approximately 2,273 acres, and is predominately surrounded by row-crop farming to the north, east and west, with light industrial to the south. The City sanitation waste transfer station is 1.5 miles southwest of the Airport. The City waste water treatment facility is located 1.4 miles to the south of the Airport.

Exhibit E-1 is an aerial of the Airport vicinity, identifying the land use types surrounding the Airport. **Exhibit E-2** depicts the City Comprehensive Land Use Plan Map (dated April, 2013) for the Airport vicinity. **Exhibit E-3** depicts the City of Pendleton and Umatilla County Zoning Map (dated April, 2015) for the Airport vicinity. The Airport is zoned by the City of Pendleton as “Airport Activities Zone” (A-A). The following are City and County zoning related to the Airport.

EXHIBIT E-1: SURROUNDING LAND USES – AERIAL (AIRPORT VICINITY)



Source: Google Maps, October, 2015.

City of Pendleton Airport Zoning (City Unified Development Code):

Airport Industrial Subdistrict (AI): intended to reserve designated Light Industrial (M1) sites near the Pendleton Airport for targeted industrial users as called for in the Pendleton Comprehensive Plan (Industrial Plan Table A-AI) and the Pendleton Economic Opportunities Analysis (EOA).

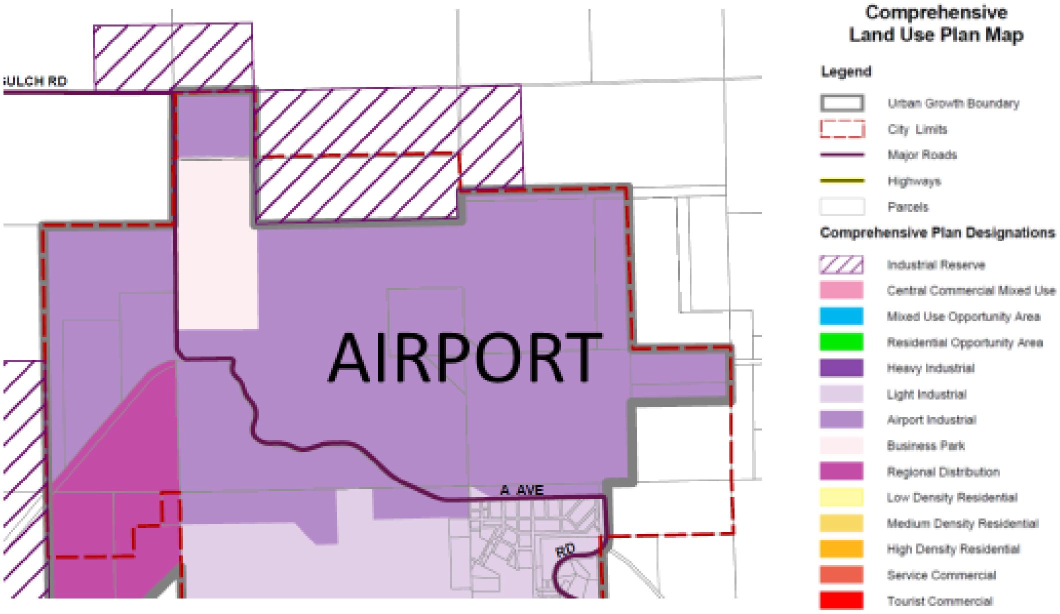
Airport Activities Zone (A-A): To protect the lands lying adjacent to the airport runway and terminal areas from incompatible development, while providing lands for airport-related and agricultural uses.

Airport Hazard District Zones (AHZ): In order to carry out the provisions of this Article, there are hereby established and created certain zones which include all of the land lying within the approach zones, transitional zones, horizontal zones, and conical zones as they apply to the Airport.

Umatilla County Airport Zoning (Umatilla County Development Ordinance):

Pendleton Airport Hazard Overlay Zone (dated June, 1984)

EXHIBIT E-2: CITY COMPREHENSIVE LAND USE PLAN MAP (AIRPORT VICINITY)



Source: City of Pendleton

EXHIBIT E-3: CITY/COUNTY ZONING MAP (AIRPORT VICINITY)

Source: City of Pendleton

Findings: The City has adopted a Unified Development Code, last updated in December of 2014, which contains standards for development within the City and the urban growth boundary, and which supports the implementation of the City of Pendleton Comprehensive Plan.

The following actions are recommended as part of proposed Airport activities affecting land use:

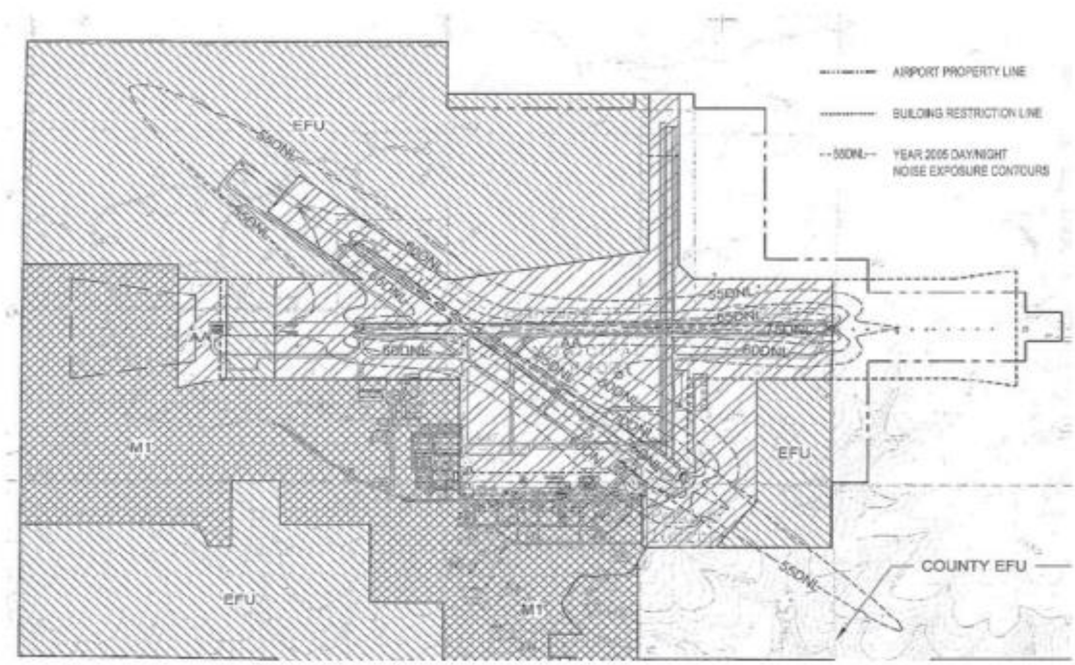
- City and County coordinate in updating Airport zoning to reflect future planned airfield and airspace developments as recommended in the Airport Master Plan, and as depicted by the update Airport Layout Plan (ALP).

- City and County planning and zoning be periodically evaluated and updated, in a coordinated fashion, to ensure that existing and future land uses surrounding the Airport remain compatible with planned Airport operations; including the height of objects, safety areas, and noise.

Noise

Background: Based on the Airport noise modeling conducted in 2002, the 60 DNL and greater noise contours are enclosed within existing Airport property, and does not contain any residences or noise sensitive areas. The 55 DNL extends beyond Airport property, but includes only farmland areas. Therefore, there are no incompatible noise impacts associated with the Airport and surrounding land uses. **Exhibit E-4** depicts the noise contours depicted as part of the 2002 PDT Airport Layout Plan.

EXHIBIT E-4: AIRPORT NOISE MAP (2002 ALP)



Source: 2002 PDT Airport Layout Plan Drawing Set (Sheet 12 of 13)

Findings: Per FAA Order 1050.1E, projects at airports that experience 90,000 annual piston-powered aircraft operations or 700 annual jet-powered aircraft operations, along with those citing a new airport, runway relocation, runway strengthening, or a major runway expansion require a noise analysis including noise contour maps. With nearly 12,000 annual operations, the Airport's traffic and aircraft fleet mix does not reach the FAA noise activity threshold warranted to conduct further noise analysis.

Air Quality

Background: Generally, an air quality analysis is needed for projects that, due to their size, scope, or location, have the potential to change or diminish air quality standards. Air quality regulation is authorized by the Clean Air Act (CAA) as administered through the Environmental Protection Agency (EPA), with the National Ambient Air Quality Standards (NAAQS) established by the Office of Air Quality Planning and Standards. Federal regulations require states to define geographic areas as 'attainment', 'non-attainment', or 'maintenance areas', in which attainment meets NAAQS, and non-attainment and maintenance areas exceed NAAQS. The Environmental Protection Agency (EPA) *Green Book of Nonattainment Areas for Criteria Pollutants* website (http://www3.epa.gov/airquality/greenbook) provides a map of all U.S. counties that are classified as nonattainment areas for criteria pollutants (i.e. ozone, particulate matter, sulfur dioxide, lead, carbon monoxide, and nitrogen dioxide). States develop EPA approved State Implementation Plans (SIP) to address air quality, and identify a plan to bring non-attainment and maintenance areas into compliance. Federal actions within non-attainment and maintenance areas usually require air quality analysis. Compliance with NAAQS means that ambient outdoor levels of defined air pollutants are safe for human health and the environment.

Findings: According to the Oregon Department of Environmental Quality (ODEQ), the Airport is within a region designated as a 'nonattainment' area. The main air quality concerns, which are common for rural areas such as Pendleton, involve particulate matter generated from windblown dust, power plant smoke emissions, vehicle exhaust, fuel combustion, and particulates from wood stoves and open-burning. The City of Pendleton allows the burning of domestic waste in abidance with daily air quality forecasts. Particle Matter (PM) defines airborne particles such as liquid, dust, smoke and dirt, as measured in micrograms per cubic meter ($\mu g/m^3$), in which inhaled particulates less than 2.5 micrometers ($PM_{2.5}$) in diameter are considered to be most harmful. Pendleton continues to meet the annual $PM_{2.5}$ standard of 15 $\mu g/m^3$. However, the change in the 24-hour $PM_{2.5}$ standard from 65 $\mu g/m^3$ to 35 $\mu g/m^3$ has presented air quality challenges for Pendleton, and similar communities nationwide and throughout Oregon. Consequently, Pendleton exceeded the new 24-hour $PM_{2.5}$ standard in 2002, but, with compliance being incomplete and based on a three-year average, Pendleton's official monitoring remains in compliance for $PM_{2.5}$.

Per FAA Order 1050.1F, Airport improvements involving less than 180,000 annual general aviation aircraft operations and less than 1.3 million annual passenger enplanements (boardings) do not require an air quality analysis. Based on the Airport Master Plan, the Airport is forecast to have substantially less activity thresholds, therefore, no air quality analysis is required. Otherwise, to minimize air quality impacts, construction activities on the Airport should follow FAA Advisory Circular 150/5370-10, "Standards for Specifying Construction of Airports". Consequently, the burning of waste at the Airport is not recommend nor anticipated. In addition, to the extent practicable, alternative power sources, cleaner-burning fuels, and the conversion to low emission vehicles measures could eventually be employed to minimize the Airport's air quality pollution.

In addition, the following activities would require Oregon Department of Environment Quality (ORDEQ) survey and/or permits:

- Asphalt, ready-mix or rock crusher plan
- Building removal involving asbestos
- Open burning
- Fuel tank installation

Farmlands/Soils

Background: The Farmland Protection Policy Act (FPPA) was enacted to minimize the extent to which federal actions and programs contribute to the unnecessary and irreversible conversion of farmland to non-agricultural uses. The FPPA, administered under the US Department of Agriculture (USDA), classifies farmland as 'prime' farmland, 'unique' farmland, or farmland of 'statewide or local importance'. Prime farmland has the best combination of physical and chemical characteristics for producing food, forage, fiber, and oilseed crops. Unique farmland is land other than prime farmland used for the production of specific high-value food and fiber crops such as citrus, tree nuts, olives, cranberries, fruits, and vegetables. Farmland of statewide or local importance includes soils that do not meet prime farmland criteria, but economically produce high yields of crops when treated and managed. A federal action which may result in conversion of farmland to non-agricultural use requires coordination with the U.S. Department of Agriculture Natural Resource Conservation Services (NRCS).

Findings: The Airport is within the Umatilla County Soil and Water Conservation District, characterized by the nearly level to rolling Umatilla Plateau sub-ecoregion, as underlain by basalt and veneered with loess deposits. The surrounding Airport area is used for dry land crops (wheat and barley), with plant communities primarily consisting of mowed grass fields and scattered ornamental trees and shrubs. In uncultivated areas, moisture levels are generally high enough to support grasslands of blue bunch wheatgrass and Idaho fescue without associated sagebrush. **Exhibit E-5** is a NRCS soils map of the Airport vicinity, identifying soil types and locations. The NRCS soil survey identifies soil types and locations, with the USDA *Prime Farmland List for Oregon* listing those which constitute prime farmland soils. Nearly 960 acres of Airport property is currently used for agricultural row-crop production; mainly for farming dryland wheat. The farmed area is comprised of the following soils:

- NRCS 114B: Walla Walla silt loam, 1% to 7% slope (prime farmland if irrigated)
- NRCS 114C: Walla Walla silt loam, 7% to 12% slope
- NRCS 6C: Anderly silt load, 7% to 12% slope

EXHIBIT E-5: SOILS MAP (AIRPORT VICINITY)

Source: NRCS On-Line Soil Survey Map, Umatilla County, Obtained October 2015.

Approximately 95 percent of the cultivated farmed Airport property is covered by the Walla Walla silt loam with 1-7% slopes; which considered prime farmland soil if irrigated. This soil is characterized as generally quite deep, well drained and generally used for the farming of dry crops, irrigated crops, and some livestock grazing.

The following actions are recommended as part of proposed Airport activities affecting farmland:

- Coordination with USDA, NRCS to determine applicability or exemption to FPPA

Threatened and Endangered Species (Fish, Wildlife, and Plants)

Background: The Endangered Species Act (ESA) provides for the protection of plants, animals, and habitats. In compliance with the ESA, agencies overseeing federally-funded projects coordinate with the U.S. Fish and Wildlife Service (USFWS) concerning species listed, or proposed to be listed, which may be present. Since the State of Oregon is a recipient of federal funds, and oversees federally-funded projects, coordination with the Oregon Fish and Wildlife Office is also anticipated.

Findings: The USFWS Information for Planning and Conservation (IPaC) website tool was consulted regarding potentially occurring species listed in the Endangered Species Act (ESA) for the Airport vicinity.

According to the USFWS, the ESA listed species within Umatilla County which have the potential to occur within the Airport area include:

- Greater Sage-grouse (Candidate)
- Yellow-billed Cuckoo (Threatened)
- Bull Trout (Threatened)
- Gray Wolf (Endangered)
- Washington Ground Squirrel (Candidate)

The Washington ground squirrel is declared ‘endangered’ by the State, and a ‘candidate’ species with respect to USFWS status. The USFWS IPaC indicates that habitat for the bull trout and steelhead salmon are in critical condition, and any impact to these species’ habitat must be considered in any project. Per a 2001 letter from the Oregon Department of Fish and Wildlife Office, three species were listed that may occur within the Airport vicinity, which included the bald eagle, steelhead salmon, and the bull trout; with the bald eagle removed by the Department of Interior in 2007. In addition, the Oregon Biodiversity Information Center indicates that there are two state threatened or endangered plant species within the Umatilla Basin; including the northern wormwood and laurence’s milk-vetch. The northern wormwood is a federal candidate species and listed by the state as an endangered species; while the laurence’s milk-vetch is a state threatened species. The FAA Wildlife Strike Database was referenced to evaluate known occurrences of wildlife species near the Airport. There are 21 known migratory birds within Umatilla County. There are three National Wildlife Refuges within Umatilla County; including Cold Springs, McKay Creek, and McNary. The closest is the McKay Creek National Wildlife Refuge, located at the McKay Reservoir six miles south of the Airport.

The following actions are recommended as part of proposed activities resulting in construction of new impervious surfaces and an increase in stormwater run-off:

- Coordinate with the National Marine Fishery Service (NMFS)
- Coordinate with the U.S. Fish and Wildlife Service (USFWS)
- Coordinate with the Oregon Fish and Wildlife Office

Wildlife

Background: The Federal Aviation Administration (FAA) recommends that public-use airport operators, especially Part 139 Certification of Airports, comply with the wildlife hazard management requirements, in accordance with FAA Airport Improvement Program (AIP) Grant Assurance No. 19, “Operations and Maintenance”, which requires AIP grant recipients to monitor, evaluate, and mitigate risks associated with wildlife hazards on and near federally obligated airports. The FAA may require such airports to conduct Wildlife Hazard Assessments (WHA) or Wildlife Hazard Site Visits (WHSV).

Findings: As requested by the FAA, a Wildlife Hazard Site Visit (WHSV) was conducted for the Airport by qualified airport wildlife biologist in May 2015, to site monitor and identify the presence of potentially hazardous wildlife that could pose risks to aircraft operations. The surrounding wheat fields and the nearby drainages are significant wildlife attractants, in which there is evidence of wildlife hazards, especially deer, identified in the Airport vicinity. Other species of concern include coyotes, as well as various species of birds, particularly larks, swallows, doves/pigeons, blackbirds, and shorebirds, which feed and loaf on the airfield.

If permanent removal of wildlife species is necessary, depredation permits should be obtained. The Airport does not hold a federal depredation permit (from the U.S. Fish and Wildlife Service) for migratory birds or a state depredation permit (from the Oregon Fish and Wildlife Office) for the control of mammals. The State of Oregon also requires a permit for the use of pyrotechnics, and the City does not hold a permit at this time. Based on the wildlife data gathered as part of the WHSV and wildlife management issues associated with the Airport, FAA will determine whether a Wildlife Hazard Assessment (WHA) or Wildlife Hazard Management Plan (WHMP) is warranted.

The following actions are recommended as part of proposed activities potentially affecting wildlife:

- Coordinate with the Oregon Fish and Wildlife Office
- Coordinate with the U.S. Fish and Wildlife Service

Wild and Scenic Rivers

Background/Findings: The closest river to the Airport is the Umatilla River, located 1.3 miles to the south. The Umatilla River is not identified as a Wild and Scenic River per the Wild and Scenic Rivers Act of 1968.

Floodplains

Background: A floodplain is generally a flat, low-lying area adjacent to a stream or river that is subject to inundation during high flows. The relative elevation of a floodplain determines its frequency of flooding. For example, a 100-year floodplain has a frequency of inundation, on average, once every 100 years. U.S. Department of Transportation (DOT) regulations direct airport development action to avoid floodplains, if another prudent and feasible alternative exists. If no prudent alternative exists, activity in floodplains should minimize adverse impacts.

Findings: The Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps (FIRMs) were referenced to identify floodplains contained within the Airport area (https: *I lmsc.* fema.gov). According to the mapping, the Airport is not within the 100-year or greater floodplain. The closest floodplain is located along the Umatilla River, approximately 7,000 feet south of the Airport, which is a Regulatory Floodway adjacent to Interstate 84 along the Union Pacific Railroad right of way. **Exhibit E-6** is a floodplain map of the Airport vicinity, identifying floodplain areas and stream locations.

EXHIBIT E-6: SURFACE DRAINAGE / FLOODPLAIN (AIRPORT VICINITY)

Source: FEMA and USGS Mapping, Obtained October 2015.

Water Features and Quality

Background: The Federal Water Pollution Control Act, as amended by the Clean Water Act (CWA), provides the authority to establish water quality standards, control discharges into surface and subsurface waters, develop waste treatment management plans and practices, and issue permits for discharges (Section 402) and for dredged or fill material (Section 404). The Fish and Wildlife Coordination Act (FWCA) applies to a proposed federal action which would impound, divert, drain, control, or otherwise modify the waters of stream or body of water, unless the project is for the impoundment of water covering an area of less than ten (10) acres. Recent federal court rulings and the 'draft' Guidance on Identifying Waters Protected by the Clean Water Act have indicated the U.S. Army Corps of Engineers (USACE) will claim jurisdiction if a wetland or stormwater drainage ditch connects to a downstream jurisdiction waterway. The FWCA requires consultation with the USFWS and applicable state agencies to identify means to prevent loss and damage to wildlife resources resulting from improvements.

Findings: Surface drainage are expected to continue to be collected in drainage systems and conveyed to detention basins, to evaporate or percolate into the subsurface. Best management practices should be developed and employed, and construction should incorporate appropriate erosion control measures.

Waterways / Surface Waters: The Umatilla River and McKay Reservoir are the two surface water bodies in the Airport vicinity. The Umatilla River runs east-west approximately 1.2 miles south of the Airport, then drains into the Columbia River about 21 miles to the north-northwest. The McKay Reservoir is 6 miles south-southeast of the Airport, and drains into the Umatilla River. None of the tributaries or rivers in the Pendleton region are considered scenic waterways. In the Airport vicinity, multiple smaller water courses are found in the gulches and ravines of the rolling hills, however they are intermittent, emergent only during runoff events. Within the Airport, there are several ephemeral drainages, primarily fed by runoff from adjacent higher elevations and seasonal stormwater flows. **Exhibit E-5** shows the location and alignment of these ephemeral channels. The ephemeral channel along the northside of the airfield ultimately drains northward towards Gulch Creek, while channels along the east, west and south sides ultimately flow into the Umatilla River.

The pesticides associated with the aerial spray operations have a stand-alone storm drainage system that collects runoff from the three operating pads and apron and flows to a dedicated detention pond north of the pads.

Stormwater: Airport stormwater runoff from the impervious runway, taxiway, apron, and rooftop surfaces flows into a storm water collection system transported outward along the runways, and conveyed along apron inlets.

South Airfield Runoff: Runoff flowing southward collects into a detention pond installed with a diffuser located about 500 feet south of the apron, between NW 47th, NW 48th, Avenue A and Avenue B. From this 15,000 square foot detention pond, water flows south to an outfall, and then into a gully where it is channeled to another catch basin, and piped to another outfall where it is released into a natural drainage swale that eventually reaches the Umatilla River, 1.25 miles south of the Airport.

North Airfield Runoff: The north airfield contains two outfalls, one at the midfield of Runway 7/25 and the other within 1,000 feet of the Runway 11 end. Both outfalls deposits runoff into a natural drainage swales, which combine and continue flowing north of the Airport.

Aquifer Recharge Areas: The City of Pendleton draws from two water sources, including basalt wells and the Umatilla River. The water is collected, treated, and stored in a basalt aquifer storage and recovery system beneath the City. To the northwest of Pendleton is one of seven Critical Groundwater Areas (CGWA) in Oregon. Oregon law requires that a CGWA is declared when ground water usage exceeds the long-term natural replenishment of the aquifer and strict restrictions are enforced. The Stage Gulch Basalt CGWA ends approximately 13 miles west of the airport. This is important as stormwater from the Pendleton area flows through this CGWA on its route to the Columbia River.

The following actions are recommended as part of proposed activities resulting in land disturbances:

- National Pollutant Discharge Elimination System (NPDES) permit coverage
- Review and monitor Stormwater Pollution Control Plan (SWPCP)

Wetlands

Background: Executive Order 11990, "Protection of Wetlands" defines wetlands as "those areas inundated by surface or ground water with a frequency sufficient to support and under normal circumstance does not or would not support a prevalence of vegetative or aquatic life that requires saturated or seasonally saturate soil conditions for growth and reproduction. Wetlands generally include swamps, marshes, bogs, and similar areas such as sloughs, potholes, wet meadows, river overflows, mud flats, and natural ponds."

Findings: The Airport is within the Columbia Plateau Level III Ecoregion as established by the United States Environmental Protection Agency (EPA). National Wetlands Inventory (NWI) maps prepared by the U.S. Fish and Wildlife Service (USFWS) show two types of jurisdictional wetlands on-Airport property, extending off-Airport, and in the Airport vicinity. **Exhibit E-7** is a wetland map of the Airport vicinity, identifying jurisdictional wetland locations and classifications.

EXHIBIT E-7: WETLAND MAP (AIRPORT VICINITY)

Source: USFWS, NWI Mapping (USDA Website), Obtained October 2015.

Wetlands colored in yellow are Freshwater Emergent Wetlands and areas colored in green are Freshwater Forest/Shrub Wetlands, both are seasonally or temporarily flooded and characterized as drainage or runoff channels through the low vegetative areas of the rolling topography native to the area.

The following actions are recommended as part of proposed activities resulting in potential wetland, drainage ditches, and water quality impacts resulting from construction disturbances or run-off:

- Coordinate with the United States Army Corps of Engineers (USACE)
- Coordinate with the Oregon Department of Environmental Quality (DEQ)
- Coordinate with the State of Oregon Department of State Lands (DSL)

Hazardous Materials, Pollution Prevention, and Solid Waste

Background: The Oregon Department of Environmental Quality (DEQ), Hazardous Waste Program is charged with regulating hazardous waste in Oregon as authorized by the United States Environmental Protection Agency (EPA). Hazardous materials are defined by the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), and the Solid Waste Disposal Act, as amended by the Resource Conservation and Recovery Act (RCRA), 42 United States Code (USC) 6901-6992. Hazardous materials include substances that because of their quantity, concentration, or physical, chemical, or infectious characteristics, may present substantial danger to public health or welfare or the environment. The two statutes of concern to the FAA are the RCRA, as amended by the Federal Facilities Compliance Act, and the CERCLA, as amended by the Superfund Amendments and Reauthorization Act (SARA) and by the Community Environmental Response Facilitation Act. RCRA governs the generation, treatment, storage, and disposal of hazardous wastes. CERCLA provides for consultation with natural resources trustees and cleanup of release of a hazardous substance, excluding petroleum, into the environment. Executive Order 12088, *Federal Compliance with Pollution Control Standards*, directs federal agencies to comply with applicable pollution control standards, in the prevention, control, and abatement of environmental pollution, and consult with the EPA, state, interstate, and local agencies concerning the techniques and methods available for the prevention, control, and abatement of environmental pollution.

Findings: A review of the DEQ Environmental Cleanup Site Information (ECSI) database identified eight (8) sites of interest on the Airport. **Exhibit E-8** is an environmental site cleanup summary map of the Airport vicinity, identifying cleanup site locations. Coordination with the DOE is recommended to determine the type and significance of applicable site.

EXHIBIT E-8: ENVIRONMENTAL CLEANUP – SITE SUMMARY REPORT (AIRPORT VICINITY)

Source: Oregon DEQ, Environmental Cleanup Site Information (ECSI) Database, November 2015.

One site of interest is 5019 located at 1517 NW 50th Drive. This site is a former Hart-Springbok Chemical building. The building was originally constructed by the United States Army during World War II and was used for purpose of meat packing. Following the end of the war, the building was acquired by the City of Pendleton in the year 1948. Over the years the site was used for various purposes, but a large portion was for formulating and storing chemical from year 1969 to 2011. The building burned down on July 14, 2011. Current remains of the building is the concrete foundation slab shown if **Exhibit E-9**. South of the foundation is an underground storage tank with a 10,000 gallon capacity. The tank has been previously been used to store chemicals and is now serving for storing aviation fuel. Currently, the City of Pendleton is applying for funding from the Oregon Business Development Department (OBDD) in order to decontaminate the .33 acre site.

Exhibit E-9

Site Name: **Hart-Springbok Chemical (Former)**

Image Title: **TBA field work**

Site Number: **5019**

Picture Date: **5/30/2013**

Source: http://www.deq.state.or.us/ "

The following are Airport activities which require regulatory oversight:
- Aircraft fuel storage and dispensing (Jet-A)
- Aircraft fuel storage and dispensing (100LL)
- Private aircraft fuel storage
- Airport support aerial application (pesticide storage)

The following actions are recommended as part of proposed activities resulting in potential hazardous materials, pollution, and solid waste:
- Coordinate with the Oregon Department of Environmental Quality (DEQ)
- Review and update Airport Spill Prevention Control and Countermeasure (SPCC)
- Review and update Airport's Municipal Solid Waste Recycling Plan

Historical, Architectural, Archeological, and Cultural Resources

Background: *The National Historic Preservation Act recommends measures to coordinate federal historic preservation activities, and to comment on federal actions affecting historic properties included in, or eligible for inclusion in, the National Register of Historic Places. The Archaeological and Historic Preservation Act "provides the survey, recovery, and preservation of significant scientific, prehistorical, historical, archeological, or paleontological data when such data may be destroyed or irreparably lost due to a federal, federally licensed, or federally funded project".* Often airport projects require that buildings be removed or previously undisturbed earth be excavated, which removes evidence of historic buildings and archaeological sites. The FAA requires that the effects of projects on historical, architectural, archaeological, and cultural resources be determined prior to improvement. The Oregon State Historic Preservation Office (SHPO) requests to review projects involving standing structures of fifty years or older and land disturbances within previously disturbed areas. Major changes in the alignments of designated historic drainage systems must be documented to standards of the Historic American Engineering Record (HAER).

Findings: Developed in 1934, the original air mail delivery airfield became a U.S. Air Force training base during World War II. The Oregon Historic Sites Database indicates that while there are numerous eligible and listed buildings in the City of Pendleton, including a historic district, there is only one eligible site near the Airport; the Pendleton Airbase Site, Resource ID number 38887. In addition, the Umatilla Indian Reservation is located east of the City of Pendleton.

The following actions are recommended as part of proposed land distance activities:

- Consultation and coordination with the Oregon State Historic Preservation Office (SHPO) (Conduct reviews and field work surveys as required)
- Review of Historic American Engineering Record (HAER)
- Coordination with the Umatilla Indian Tribe

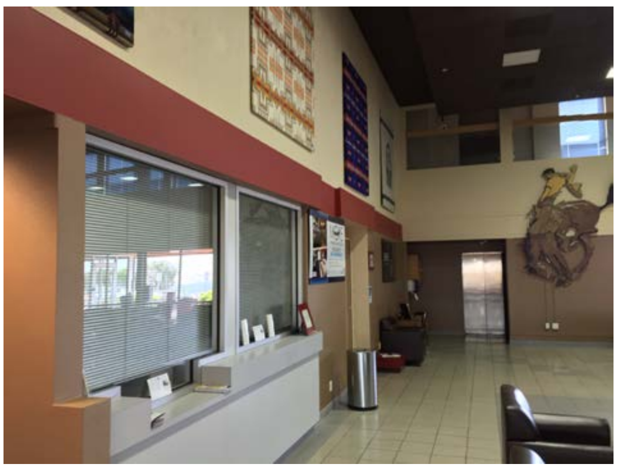
Environmental Overview Summary

It should be noted this Environmental Overview is not intended to fulfill the procedural requirements in providing a full-analysis of considerations or consequences as outlined in FAA Order 1050.1F, *Environmental Impacts and Procedures* or satisfy the environmental clearance requirements pursuant to the National Environmental Policy Act (NEPA) and Oregon State Environmental Policy Act (SEPA) guidelines.

Coordination with the FAA will determine whether an impact from a proposed Airport development action, or specific project, is considered to be significant, as typically associated with conducting an Environmental Categorical Exclusion (CATEX), Environmental Assessment (EA), or Environmental Impact Statement (EIS). Conducted beyond the Airport Master Plan, these environmental clearance efforts are typically accomplished as stand-along projects prior to construction, with an understanding of the environmental agencies involved. Early correspondence and further coordination with these agencies is anticipated in order to gain environmental acceptance for certain NEPA-triggering developments sought by the Airport.

Appendix E

EASTERN OREGON REGIONAL AIRPORT



Building Survey

Preliminary Report

Eastern Oregon Regional Airport

Pendleton, Oregon

Report prepared by

Mead & Hunt

www.meadhunt.com

September 23, 2015

Table of Contents

1. Introduction

The existing terminal is a four-story building with a partial basement. The control tower is located within the building, in an area encompassing the third and fourth floor. The square footage for the areas are as follows:

- Basement – 1,058 sf
- First Floor – 12,869 sf
- Second Floor – 9,220 sf
- Third Floor – 950 sf
- Fourth Floor – 400 sf
- Total Building – 23,147 sf

The basement is devoted to mechanical equipment and access to utilities entering the building.

The first floor is effectively divided into two halves. The western half encompasses airline and rental car counters, associated offices for the business operations and security, baggage claim, a large two-story vestibule and a separate two-story gate lobby with a security passage. The eastern half contains the restrooms, lounge, restaurant and the associated kitchen, prep areas, storage, refrigeration and freezer.

The second floor separated into two areas divided by the open space of the first floor vestibule. The western half is reserved for the airport administration and includes a conference room, the administrator's office, conference space, a restroom and two support offices. An additional three offices are devoted to storage. The eastern portion of the second floor houses offices for the Greater Eastern Oregon Development Corporation and the unmanned operations administration. This space incorporates seven rooms used for offices, conference room, break area and storage.

The third and fourth floors are located in the western portion of the main terminal building and is function is solely the FAA control tower. The third floor houses equipment, work space and general office space that services the fourth floor tower operations.

2. Administrative

An interview was conducted at the time of the survey with Steve Chisman, Director and Airport Manager, Wayne Green, Engineer with the City of Pendleton and Glenn Graham, Facilities and Technologies Manager.

At this time, the Airport is served by one airline, Seaport, and has one on-site rental car agency, Hertz. Seaport currently offers four flights a day out of Pendleton to Portland. The Airport averages between 4,700 and 5,000 enplanements (passengers that board aircraft) per year. The air traffic control tower (ATCT) is funded by the FAA at 95 percent. There are no airline boarding security requirements, as there is no TSA presence. The Airport serves a base for the Army National Guard, a critical support base for Life Flight and an active general aviation community. The Life Flight unit is one of the busiest in the region with two helicopters and a fixed wing aircraft. A hangar is currently under construction to serve Life Flight. The Airport is designated as an emergency alternate landing facility for commercial flights, with the runway capable of handling up to a Boeing 757 sized aircraft.

The community support for the Airport has been inconsistent. The current administration understands the importance of the Airport to the community at large and are pursuing avenues of expanding the Airport's service to the community. There are plans for future development on the 2,273-acre site that could provide an economic boost to the community. There is an opportunity to rent space within the building to other agencies or businesses. Future planning includes new hangar facilities as well as business site development. The Airport recently received a 1.7 million dollar grant and support loans to fund hangars and support facilities for the Pendleton Unmanned Aerial Systems Range. This will serve to help develop the unmanned test range program at the Airport.

The issues of concern from the administrative team regarding the terminal building, are the age and safety of the building. There are concerns with regards to hazardous materials used in the construction of the building, ADA compliancy issues, possible future building adaptation and space allocation.

3. Historical Timeline

The original construction of the building was 1955. In 1960, baggage claim, an expanded men's room and office space were added. An expansion of the restaurant and kitchen was completed in 1961. 1964 saw an addition of second floor offices to the eastern portion of the building. An exterior emergency exiting stairway was added in 1977. A major renovation was done in 1995, which included interior renovations and an addition of the gate lobby.

4. Building Envelope

The building exterior is composed of brick and stucco with some wood siding at the third and fourth floor levels. The aluminum windows correspond to the time of their construction, mostly single pane glass with the addition of storm windows in portions of the building. Later construction has double pane aluminum storefront in the main service and lobby areas. The building has been mostly repainted with about ten percent to be completed.

The third and fourth floor wood sheathing is in need of replacement as well as the surrounding trim, which has come off in places. The stucco and brick exterior appear in good condition. There is no apparent structural issues in the integrity of the walls, the exposed laminated beams are in good condition. The openings are in need of attention. The wooden doors and windows and their frames in the original construction and at the restaurant are in need of replacement. The aluminum doors in the older sections of the building may be in need of maintenance or replacement.

All pre-1995 construction windows are in need of replacement both for energy efficiency and envelope integrity. At many openings, water infiltration has damaged the interior finishes and may have impacted the integrity of the surrounding walls and ceilings. The membrane roof has been recently replaced and appears to be in excellent condition. All sidewalks and curbing appear to be in good condition.

5. Interior Conditions – First Floor

There are varying levels of quality with the interior finishes. The public spaces, the main lobby, ticketing counters and gate lobby are in very good condition. The spaces consist of porcelain tile flooring, plastic laminated casework, painted plaster walls and acoustical suspended acoustical ceiling. All the surfaces are well maintained in very good condition. The natural lighting is excellent within this space and the down lighting is at appropriate levels.

The restrooms adjacent to the lobby are well maintained but are showing their age. The flooring is ceramic tile with ceramic tile wainscoting with painted plaster walls. The ceilings are painted plaster. The restrooms are in need of updating.

The restaurant and bar are large and appropriately sized for their use. The flooring is a low pile carpeting that has been placed on asbestos vinyl tile and is in need of replacement. The walls are painted gypsum board and the ceiling is adhered acoustical tile between laminated beams in the restaurant, with a suspended ceiling in the lounge. The lighting in the lounge area is primarily from down light cans. In the restaurant area, track lights provide the artificial lighting, with natural light coming from the large view windows facing the tarmac and runways and clerestory windows from the south. Exposed mechanical ductwork serves the restaurant, the lounge has supply and return grilles in the drop ceiling. The kitchen and prep areas are well maintained but could use an upgrade. The general condition of these spaces is good.

6. Interior Conditions – Second Floor

The second floor has a wide range of conditions. On the eastern portion of the second floor, the flooring is a low pile carpeting that has been placed over vinyl tile with the exception of the exposed tile floor in a breakroom. The ceilings are an adhered acoustical tile. Lighting is provided by surface mounted fluorescent lights. The windows are single pane aluminum hoppers. Although the spaces are well maintained, they are in need of an intensive remodel. The lighting is harsh and there is evidence of water infiltration at the windows.

On the western side of the second floor, the offices have a much wider range of finish conditions. The active administrative offices have been upgraded with newer low pile carpeting over vinyl tile, an acoustical drop ceiling and integrated lighting. The windows are single pane aluminum hoppers. These windows have an added layer of storm windows but show evidence of water infiltration. The offices around the perimeter of the second floor have been relegated to primarily storage spaces and are generally in poor condition. These spaces have not been maintained well and the finishes are deteriorating primarily from water infiltration. The finishes of these rooms have low pile carpeting over vinyl tile, painted plaster walls and adhered acoustic tile. The rooms have been retrofitted with surface mounted fluorescent lights sometime in past. The windows are single pane aluminum hoppers. Extensive water damage has occurred in the southern rooms. Both wall finishes and ceiling surfaces have been infiltrated by water over time and these surfaces are highly compromised.

7. Interior Conditions – Third and Fourth Floor

The third floor is a support area for ATCT operations on the fourth floor. Both of these spaces have low pile carpeting over vinyl tile, painted plaster walls and adhered acoustic tile. The windows are single pane aluminum hoppers. The stairway access does not meet code requirements and is an unsafe passage way. These areas are well maintained but in need of an upgrade.

8. Hazardous Material Concerns

Considering the time of construction of the original building and its' subsequent renovations, it is reasonable to suspect hazardous construction material throughout the building. During the building survey it was noted that the adhered acoustical ceiling tiles and flooring tiles are of appropriate size and nature to suspect asbestos in their composition. As most of the construction, with the exception of the 1995 renovation, was completed prior to regulatory control over the use of lead in paint, it would be appropriate to assume that the original layers of paint could be lead based. It is to be noted that the 1995 construction drawings noted the presence of asbestos containing material and called for its removal. It is recommended that a complete hazardous material survey be done prior to any construction planning or activity. In the areas where the finishes have been compromised, tests should be conducted to insure that the occupants safe from hazardous material as well mold and mildew.

9. Electrical and Mechanical Systems

The building systems have been upgraded through time to provide adequate service throughout the building. The electrical panels appear to be relatively new and in very good condition. The mechanical units serving the building are in varying stages of their life cycle expectancy. The roof top systems have been upgraded on an as-need basis, so it is difficult to assess the quality of the complete system. It is recommended that a more in depth analysis of these systems be done in order to provide a clearer picture.

10. Code Issues

The building renovations seems have been cognizant of providing a response to the changing codes over time. The areas of concern would be the access to the control tower, accessibility compliance at the small restrooms serving the non-public spaces and to the level change at the restaurant.

11. Summation

In general, the building is in reasonably good condition considering its age. It is apparent that the building has been well maintained over the years but that some neglect has compromised the building envelope. The public-serving spaces are well maintained and have been improved to present themselves well. The back of house areas are not as well preserved and would take a major renovation to make the building sound, more energy efficient, and to provide a comfortable public space and work environment.

Among the necessary upgrades to improve and preserve the current building would be to replace all the windows with energy efficient models. Repair all exterior walls and details to repair the breeches in the envelope and complete the painting of the building. The ATCT is in need of a complete renovation with particular attention to the access stairway. Doors that are in poor condition should be replaced. If hazardous material is found in the building, total removal and remediation of such material is critical. To increase the building's performance, new plumbing fixtures could replace the current fixtures.

The second floor offices, on the eastern half of the building, are currently vacant and could provide a leasing opportunity to the airport. The condition of these spaces would require a complete renovation of the offices including hazardous material removal. The restroom serving this area would need to be expanded to meet ADA requirements. The cost to renovate this suite of offices would need to be balanced with the revenue generated in order to evaluate if this would be a cost effective possibility.

An in depth structural, electrical and mechanical survey should be commissioned to understand the soundness of the building and quality of service within the building. Fire protection was not evaluated in this survey.

A complete planning evaluation should be conducted with the owner and all vested partners to understand the future direction and needs for the users. As all costs and future needs are defined, it can be more clearly decided whether a new terminal is appropriate or the renovation of the current terminal is a better choice. The cost of updating the current terminal, including the possibility of hazardous material remediation, could well be comparable to its replacement with a new facility.

12. Terminal Space Requirements

The following forecast is based on four flights a day with an average of 21 passengers per flight (21 enplaning and 21 deplaning for 42 peak hour passengers total). The estimate is based on the assumption that security being just prior to flight boarding and that checked bags will be delivered to Transportation Security Administration (TSA) by the boarding passenger. The security square footage is based on typical current TSA layouts and may be subject to change. TSA may also require some office and communication room space. TSA requirements will require coordination with TSA directly.

The table below shows current available lobby space to be 4,008 square feet. The forecasted needs, broken out by specific spaces, totals 3,980 square feet. The configuration for the increase passenger volume should fit within the current footprint. The baggage claim space is undersized, but can function at this level if so desired. The restrooms would need to be reconfigured to meet current codes.

13. Terminal Space Requirements Forecast

Planned Needs	Function	Occupants	Square Footage	Note
Public Area	Ticketing and Rental Car Queuing		250 sf	
Public Area	Pre-Security Lobby Area	60 people	1,080 sf	Includes passengers and Meeter/Greeters
Secure Area	Security – Passengers		1,800 sf	
Secure Area	Security – Checked Bags		250 sf	
Secure Area	Post Security Hold Room	30 people	600 sf	Allows for gate podium and vending
Total			**3,980 sf**	
Total Area of Current Lobby			**4,008 sf**	

Glossary of Terms

GLOSSARY OF AVIATION TERMS

Above Ground Level (AGL) – As measured above the ground; used to identify heights of built items (towers, etc.) on aeronautical charts in terms of absolute height above the ground.

Accelerate Stop Distance Available (ASDA) – The length of the takeoff run available plus the length of a stopway, when available.

Agricultural Aviation – The use of fixed-wing or rotor-wing aircraft in the aerial application of agricultural products (i.e., fertilizers, pesticides, etc.).

Air Cargo - All commercial air express and air freight with the exception of airmail and parcel post.

Air Carrier/Airline - All regularly scheduled airline activity performed by airlines certificated in accordance with Federal Aviation Regulations (FAR Part 121).

Air Taxi - Operations of aircraft "for hire" for specific trips, commonly referred to an aircraft available for charter (FAR Part 135).

Air Traffic Control Facilities (ATC-F) – Electronic equipment and buildings aiding air traffic control (ATC) - for communications, surveillance of aircraft including weather detection and advisory systems.

Aircraft Approach Category - Grouping of aircraft based on the speed they are traveling when configured for landing (typically 1.3 times the aircraft stall speed in landing configuration). As a rule of thumb, slower approach speeds mean smaller airport dimensions and faster approach speeds require larger dimensions. The aircraft approach categories are:

Category A - Speed less than 91 knots;

Category B - Speed 91 knots or more but less than 121 knots

Category C - Speed 121 knots or more but less than 141 knots

Category D - Speed 141 knots or more but less than 166 knots

Category E - Speed 166 knots or more

Aircraft Holding Area – An area typically located adjacent to a taxiway and runway end designed to accommodate aircraft prior to departure (for pre–takeoff engine checks, instrument flight plan clearances, etc.). Per FAA design standards, aircraft holding areas should be located outside the runway safety area (RSA) and obstacle free zone (OFZ) and aircraft located in the holding area should not interfere with normal taxiway use (taxiway object free area). Sometimes referred to as holding bays or "elephant ear." Smaller areas (aircraft turnarounds) are used to facilitate aircraft movement on runways without exit taxiways or where back-taxiing is required.

Aircraft Operation - A landing or takeoff is one operation. An aircraft that takes off and then lands creates two aircraft operations.

Aircraft Owners and Pilots Association (AOPA) – A general aviation organization.

Aircraft Parking Line (APL) – A setback depicted on an ALP or other drawings that defines the minimum separation between aircraft parking areas and an adjacent runway or taxiway. The APL dimension reflects runway and taxiway clearances (object free area, etc.) and FAR Part 77 airspace surface clearance (transitional surface penetrations) for parked aircraft. Typically the tail height of the parked aircraft is used to determine adequate clearance for the transitional surface.

Airplane Design Group - A grouping of airplanes based on wingspan and tail height. As with Approach Category, the wider the wingspan, the bigger the aircraft is, the more room it takes up for operating on an airport. The Airplane Design Groups are:

Group I:	Up to but not including 49 feet or tail height up to but not including 20 feet.
Group II:	49 feet up to but not including 79 feet or tail height from 20 up to but not including 30 feet.
Group III:	79 feet up to but not including 118 feet or tail height from 30 up to but not including 45 feet.
Group IV:	118 feet up to but not including 171 feet or tail height from 45 up to but not including 60 feet.
Group V:	171 feet up to but not including 214 feet or tail height from 60 up to but not including 66 feet.
Group VI:	214 feet up to but not including 262 feet or tail height from 66 up to but not including 80 feet.

Airport - A landing area regularly used by aircraft for receiving or discharging passengers or cargo, including heliports and seaplane bases.

Airport Beacon (also Rotating Beacon) – A visual navigational aid that displays alternating green and white flashes for a lighted land airport and white for an unlighted land airport.

Airports District Office (ADO) - The "local" office of the FAA that coordinates planning and construction projects. The Seattle ADO is responsible for airports located in Washington, Oregon, and Idaho.

Airport Improvement Program (AIP) - The funding program administered by the Federal Aviation Administration (FAA) with user fees which are dedicated to improvement of the national airport system. This program currently provides 95% of funding for eligible airport improvement projects. The local sponsor of the project (i.e., airport owner) provides the remaining 5% known as the "match."

Airport Layout Plan (ALP) - The FAA approved drawing which shows the existing and anticipated layout of an airport for the next 20 years. An ALP is prepared using FAA design standards. Future development projects must be consistent with the ALP to be eligible for FAA funding. ALP drawings are typically updated every 7 to 10 years to reflect significant changes, or as needed.

Airport Reference Code (ARC) - An FAA airport coding system that is defined based on the critical or design aircraft for an airport or individual runway. The ARC is an alpha-numeric code based on aircraft approach speed and airplane wingspan (see definitions in glossary). The ARC is used to determine the appropriate design standards for runways, taxiways, and other associated facilities. An airport designed to accommodate a Piper Cub (an A-I aircraft) requires less room than an airport designed to accommodate a Boeing 747 (a D-V aircraft).

Airport Reference Point (ARP) – The approximate mid-point of an airfield that is designated as the official airport location.

Aircraft Rescue and Fire Fighting (ARFF) - On airport emergency response required for certificated commercial service airports (see FAR Part 139).

Airside – The portion of an airport that includes aircraft movement areas (runways, taxiways, etc.)

Airspace - The area above the ground in which aircraft travel. It is divided into enroute and terminal airspace, with corridors, routes, and restricted zones established for the control and safety of air traffic.

Alternate Airport – An airport that is available for landing when the intended airport becomes unavailable. Required for instrument flight planning in the event that weather conditions at destination airport fall below approach minimums (cloud ceiling or visibility).

Annual Service Volume (ASV) - An estimate of how many aircraft operations an airport can handle based upon the number, type and configuration of runways, aircraft mix (large vs. small, etc), instrumentation, and weather conditions with a “reasonable” amount of delay. ASV is a primary planning standard used to determine when a runway (or an airport) is nearing its capacity, and may require new runways or taxiways. As operations levels approach ASV, the amount of delay per operation increases; once ASV is exceeded, “excessive” delay generally exists.

Approach End of Runway - The end of the runway used for landing. Pilots generally land into the wind and choose a runway end that best aligns with the wind.

Approach Light System (ALS) – Configurations of lights positioned symmetrically beyond the runway threshold and the extended runway centerline. The ALS visually augments the electronic navigational aids for the runway.

Approach Surface (Also FAR Part 77 Approach) - An imaginary (invisible) surface that rises and extends from the ends of a runway to provide an unobstructed path for aircraft to land or take off. The size and slope of the approach surface vary depending upon the size of aircraft that are accommodated and the approach capabilities (visual or instrument).

Apron - An area on an airport designated for the parking, loading, fueling, or servicing of aircraft (also referred to as tarmac and ramp).

Aqueous Film Forming Foam (AFFF) – A primary fire fighting agent that is used to create a blanket that smothers flame or prevents ignition (fuel spills, etc.). AFFF is also used to foam runways during emergency landings.

Asphalt or Asphaltic Concrete (AC) – Flexible oil-based pavement used for airfield facilities (runways, taxiways, aircraft parking apron, etc.); also commonly used for road construction.

Automated Surface Observation System (ASOS) and Automated Weather Observation System (AWOS) – Automated observation systems providing continuous on-site weather data, designed to support aviation activities and weather forecasting.

AVGAS – Highly refined gasoline used in airplanes with piston engines. The current grade of AVGAS available is 100 Octane Low Lead (100LL).

Avigation Easement - A grant of property interest (airspace) over land to ensure unobstructed flight. Typically acquired by airport owners to protect the integrity of runway approaches. Restrictions typically include maximum height limitations for natural (trees, etc.) or built items, but may also address permitted land uses by the owner of the underlying land that are compatible with airport operations.

Back-Taxiing – The practice of aircraft taxiing on a runway before takeoff or after landing, normally, in the opposite direction of the runway's traffic pattern. Back-taxiing is generally required on runways without taxiway access to both runway ends.

Based Aircraft - Aircraft permanently stationed at an airport usually through some form of agreement with the airport owner. Used as a measure of activity at an airport.

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

Ceiling – The height above the ground or water to base of the lowest cloud layers covering more than 50 percent of the sky.

Charter - Operations of aircraft "for hire" for specific trips, commonly referred to an aircraft available for charter.

Circle to Land or Circling Approach – An instrument approach procedure that allows pilots to "circle" the airfield to land on any authorized runway once visual contact with the runway environment is established and maintained throughout the procedure.

Commercial Service Airport - An airport designed and constructed to serve scheduled or unscheduled commercial airlines. Commercial service airports are certified under FAR Part 139.

Common Traffic Advisory Frequency (CTAF) – A frequency used by pilots to communicate and obtain airport advisories at an uncontrolled airport.

Complimentary Fire Extinguishing Agent – Fire extinguishing agents that provide rapid fire suppression, which may be used in conjunction with principal agents (e.g., foam). Examples include sodium-based and potassium-based dry chemicals, Halocarbons, and Carbon dioxide. Also recommended for electrical and metal fires where water-based foams are not used. Complimentary agents are paired with principal agents based on their compatibility of use.

Conical Surface - One of the "FAR Part 77 "Imaginary" Surfaces. The conical surface extends outward and upward from the edge of the horizontal surface at a slope of 20:1 to a horizontal distance of 4,000 feet.

Controlling Obstruction – The highest obstruction relative to a defined plane of airspace (i.e., approach surface, etc.).

Critical Aircraft - Aircraft which controls one or more design items based on wingspan, approach speed and/or maximum certificated take off weight. The same aircraft may not be critical to all design items (i.e., runway length, pavement strength, etc.). Also referred to as "design aircraft."

Crosswind - Wind direction that is not parallel to the runway or the path of an aircraft.

Crosswind Runway – An additional runway (secondary, tertiary, etc.) that provides wind coverage not adequately provided by the primary runway. Crosswind runways are generally eligible for FAA funding when a primary runway accommodates less than 95 percent of documented wind conditions (see wind rose).

Decision Height (DH) – For precision instrument approaches, the height (typically in feet or meters above runway end touchdown zone elevation) at which a decision to land or execute a missed approach must be made by the pilot.

Declared Distances – The distances the airport owner declares available for airplane operations (e.g., takeoff run, takeoff distance, accelerate-stop distance, and landing distance). In cases where runways meet all FAA design criteria without modification, declared distances equal the total runway length. In cases where any declared distances are less than full runway length, the dimension should be published in the FAA Airport/Facility Directory (A/FD).

Departure Surface – A surface that extends upward from the departure end of an instrument runway that should be free of any obstacle penetrations. For instrument runways other than air carrier, the slope is 40:1, extending 10,200 feet from the runway end. Air carrier runways have a similar surface designed for one-engine inoperative conditions with a slope of 62.5: 1.

Design Aircraft - Aircraft which controls one or more design items based on wingspan, approach speed and/or maximum certificated takeoff weight. The same aircraft may not represent the design aircraft for all design items (i.e., runway length, pavement strength, etc.). Also referred to as "critical aircraft."

Displaced Threshold – A landing threshold located at a point other than on the runway end, usually provided to mitigate close-in obstructions to runway approaches for landing aircraft. The area between the runway end and the displaced threshold accommodates aircraft taxi and takeoff, but not landing.

Distance Measuring Equipment (DME) – Equipment that provides electronic distance information to enroute or approaching aircraft from a land-based transponder that sends and receives pulses of fixed duration and separation. The ground stations are typically co-located with VORs, but they can also be co-located with an ILS.

Distance Remaining Signs – Airfield signs that indicate to pilots the amount of useable runway remaining in 1,000-foot increments. The signs are located along the side of the runway, visible for each direction of runway operation.

DNL - Day-night sound levels, a mathematical method of measuring noise exposure based on cumulative, rather than single event impacts. Night time operations (10pm to 7AM) are assessed a noise penalty to reflect the increased noise sensitivity that exists during normal hours of rest. Previously referred to as Ldn.

Easement – An agreement that provides use or access of land or airspace (see avigation easement) in exchange for compensation.

Enplanements - Domestic, territorial, and international revenue passengers who board an aircraft in the states in scheduled and non-scheduled service of aircraft in intrastate, interstate, and foreign commerce and includes intransit passengers (passengers on board international flights that transit an airport in the US for non-traffic purposes).

Entitlements - Distribution of Airport Improvement Plan (AIP) funds by FAA from the Airport & Airways Trust Fund to commercial service airport sponsors based on passenger enplanements or cargo volumes and smaller fixed amounts for general aviation airports (Non-Primary Entitlements).

Experimental Aircraft – See homebuilt aircraft.

Federal Aviation Administration (FAA) - The FAA is the branch of the U.S. Department of Transportation that is responsible for the development of airports and air navigation systems.

FAR Part 77 - Federal Air Regulations (FAR) which establish standards for determining obstructions in navigable airspace and defines imaginary (airspace) surfaces for airports and heliports that are designed to prevent hazards to air navigation. FAR Part 77 surfaces include approach, primary, transitional, horizontal, and conical surfaces. The dimensions of surfaces can vary with the runway classification (large or small airplanes) and approach type of each runway end (visual, nonprecision instrument, precision instrument). The slope of an approach surface also varies by approach type and runway classification. FAR Part 77 also applies to helicopter landing areas.

FAR Part 139 - Federal Aviation Regulations which establish standards for airports with scheduled passenger commercial air service. Airports accommodating scheduled passenger service with aircraft more than 9 passenger seats must be certified as a “Part 139” airport. Airports that are not certified under Part 139 may accommodate scheduled commercial passenger service with aircraft having 9 passenger seats or less.

Final Approach Fix (FAF) – The fix (location) from which the final instrument approach to an airport is executed; also identifies beginning of final approach segment.

Final Approach Point (FAP) – For non-precision instrument approaches, the point at which an aircraft is established inbound for the approach and where the final descent may begin.

Fixed Base Operator (FBO) - An individual or company located at an airport providing aviation services. Sometimes further defined as a "full service" FBO or a limited service. Full service FBOs typically provide a broad range of services (flight instruction, aircraft rental, charter, fueling, repair, etc) where a limited service FBO provides only one or two services (such as fueling, flight instruction or repair).

Fixed Wing - A plane with one or more "fixed wings," as opposed to a helicopter that utilizes a rotary wing.

Flexible Pavement – Typically constructed with an asphalt surface course and one or more layers of base and subbase courses that rest on a subgrade layer.

Flight Service Station (**FSS) –** FAA or contracted service for pilots to contact (on the ground or in the air) to get weather and airport information. Flight plans are also filed with the FSS.

General Aviation (GA) - All civil (non-military) aviation operations other than scheduled air services and non-scheduled air transport operations for hire.

Glide Slope (GS) – For precision instrument approaches, such as an instrument landing system (ILS), the component that provides electronic vertical guidance to aircraft.

Global Positioning System (GPS) - GPS is a system of navigating which uses multiple satellites to establish the location and altitude of an aircraft with a high degree of accuracy. GPS supports both enroute flight and instrument approach procedures.

Helicopter Landing Pad (Helipad) – A designated landing area for rotor wing aircraft. Requires protected FAR Part 77 imaginary surfaces, as defined for heliports (FAR Part 77.29).

Helicopter Parking Area – A designated area for rotor wing aircraft parking that is typically accessed via hover-taxi or ground taxiing from a designated landing area (e.g., helipad or runway-taxiway system). If not used as a designated landing area, helicopter parking pads do not require dedicated FAR Part 77 imaginary surfaces.

Heliport – A designated helicopter landing facility (as defined by FAR Part 77).

Height Above Airport (HAA) – The height of the published minimum descent altitude (MDA) above the published airport elevation. This is normally published in conjunction with circling minimums.

High Intensity Runway Lights (HIRL) - High intensity (i.e., very bright) lights are used on instrument runways to help pilots to see the runway when visibility is poor.

High Speed (Taxiway) Exit – An acute-angled exit taxiway extending from a runway to an adjacent parallel taxiway which allows landing aircraft to exit the runway at a higher rate of speed than is possible with standard (90-degree) exit taxiways.

Hold Line (Aircraft Hold Line) – Pavement markings located on taxiways that connect to runways, indicating where aircraft should stop before entering runway environment. At controlled airports, air traffic control clearance is required to proceed beyond a hold line. At uncontrolled airports, pilots are responsible for ensuring that a runway is clear prior to accessing for takeoff.

Hold/Holding Procedure – A defined maneuver in controlled airspace that allows aircraft to circle above a fixed point (often over a navigational aid or GPS waypoint) and altitude while awaiting further clearance from air traffic control.

Home Built Aircraft - An aircraft built by an amateur from a kit or specific design (not an FAA certified factory built aircraft). The aircraft built under the supervision of an FAA-licensed mechanic and are certified by FAA as "Experimental."

Horizontal Surface - One of the FAR Part 77 Imaginary (invisible) Surfaces. The horizontal surface is an imaginary flat surface 150 feet above the established airport elevation (typically the highest point on the airfield). Its perimeter is constructed by swinging arcs (circles) from each runway end and connecting the arcs with straight lines. The oval-shaped horizontal surface connects to other Part 77 surfaces extending upward from the runway and also beyond its perimeter.

Hot Spot – A location on an airport movement area with a history of potential risk of collision or runway incursion, and where heightened attention by pilots and drivers is necessary.

Initial Approach Point/Fix (IAP/IAF) – For instrument approaches, a designated point where an aircraft may begin the approach procedure.

Instrument Approach Procedure (IAP) – A series of defined maneuvers designed to enable the safe transition between enroute instrument flight and landing under instrument flight conditions at a particular airport or heliport. IAPs define specific requirements for aircraft altitude, course, and missed approach procedures. See precision or nonprecision instrument approach.

Instrument Flight Rules (IFR) - IFR refers to the set of rules pilots must follow when they are flying in bad weather. Pilots are required to follow these rules when operating in controlled airspace with visibility (ability to see in front of themselves) of less than three miles and/or ceiling (a layer of clouds) lower than 1,000 feet.

Instrument Landing System (ILS) - An ILS is an electronic navigational aid system that guides aircraft for a landing in bad weather. Classified as a precision instrument approach, it is designed to provide a precise approach path for course alignment and vertical descent of aircraft. Generally consists of a localizer, glide slope, outer marker, and middle marker. ILS runways are generally equipped with an approach lighting system (ALS) to maximize approach capabilities. A Category I ILS allows aircraft to descend as low as 200 feet above runway elevation with ½ mile visibility.

Instrument Meteorological Conditions (IMC) - Meteorological conditions expressed in terms of visibility, distance from clouds, and ceiling less than minima specified for visual meteorological conditions.

Instrument Runway - A runway equipped with electronic navigational aids that accommodate straight-in precision or nonprecision instrument approaches.

Itinerant Operation - All aircraft operations at an airport other than local, i.e., flights that come in from another airport.

Jet Fuel – Highly refined grade of kerosene used by turbine engine aircraft. Jet-A is currently the common commercial grade of jet fuel.

Knot (Nautical Mile) – one nautical mile = 1.152 statute miles.

Landing Area - That part of the movement area intended for the landing and takeoff of aircraft.

Landing Distance Available (LDA) – The length of runway which is available and suitable for the ground run of an airplane landing.

Landside – The portion of an airport that includes aircraft parking areas, fueling, hangars, airport terminal area facilities, vehicle parking and other associated facilities.

Larger than Utility Runway – As defined under FAR Part 77, a runway designed and constructed to serve large planes (aircraft with maximum takeoff weights greater than 12,500 pounds).

Ldn – Noise measurement metric (see DNL)

Left Traffic – A term used to describe which side of a runway the airport traffic pattern is located. Left traffic indicates that the runway will be to the pilot's left when in the traffic pattern. Left traffic is standard unless otherwise noted in facility directories at a particular airport.

Large Aircraft - An aircraft with a maximum takeoff weight more than 12,500 lbs.

Light Sport Aircraft (LSA) – A basic aircraft certified by FAA that can be flown by pilots with limited flight training (Sport Pilot certificates), but also provide lower cost access to basic aircraft for all pilot levels. LSA design limits include maximum a gross takeoff weight of 1,320 pounds (land planes) and a maximum of two seats.

Local Area Augmentation System (LAAS) – GPS-based instrument approach that utilizes ground-based systems to augment satellite coverage to provide vertical (glideslope) and horizontal (course) guidance.

Local Operation - Aircraft operation in the traffic pattern or within sight of the tower, or aircraft known to be departing or arriving from flight in local practice areas, or aircraft executing practice instrument approaches at the airport.

Localizer – The component of an instrument landing system (ILS) that provides electronic lateral (course) guidance to aircraft. Also used to support non-precision localizer approaches.

LORAN C - A navigation system using land based radio signals, which indicates position and ground speed, but not elevation. (See GPS)

Localizer Performance with Vertical Guidance (LPV) – Satellite navigation (SATNAV) based GPS approaches providing "near category I" precision approach capabilities with course and vertical guidance. LPV approaches are expected to eventually replace traditional step- down, VOR and NDB procedures by providing a constant, ILS glideslope-like descent path. LPV approaches use high-accuracy WAAS signals, which allow narrower glideslope and approach centerline obstacle clearance areas.

Magnetic Declination – Also called magnetic variation, is the angle between magnetic north and true north. Declination is considered positive east of true north and negative when west. Magnetic declination changes over time and with location. Runway end numbers, which reflect the magnetic heading/alignment (within 5 degrees +/-) occasionally require change due to declination.

MALSR - **M**edium-intensity **A**pproach **L**ighting **S**ystem with **R**unway alignment indicator lights. An approach lighting system (ALS) which provides visual guidance to landing aircraft.

Medevac - Fixed wing or rotor-wing aircraft used to transport critical medical patients. These aircraft are equipped to provide life support during transport.

Medium Intensity Runway Lights (MIRL) - Runway edge lights which are not as intense as HIRLs (high intensity runway lights). Typical at medium and smaller airports which do not have sophisticated instrument landing systems.

Microwave Landing System (MLS) - An instrument landing system operating in the microwave spectrum, which provides lateral and vertical guidance to aircraft with compatible equipment. Originally developed as the "next-generation" replacement for the ILS, the FAA discontinued the MLS program in favor of GPS-based systems.

Minimum Descent Altitude (MDA) – The lowest altitude in a nonprecision instrument approach that an aircraft may descend without establishing visual contact with the runway or airport environment.

Minimums - Weather condition requirements established for a particular operation or type of operation.

Missed Approach Procedure – A prescribed maneuver conducted by a pilot when an instrument approach cannot be completed to a landing. Usually requires aircraft to climb from the airport environment to a specific holding location where another approach can be executed or the aircraft can divert to another airport.

Missed Approach Point (MAP) – The defined location in a nonprecision instrument approach where the procedure must be terminated if the pilot has not visually established the runway or airport environment.

Movement Area - The runways, taxiways and other areas of the airport used for taxiing, takeoff and landing of aircraft, i.e., for aircraft movement.

MSL - Elevation above Mean Sea Level.

National Plan of Integrated Airport Systems (NPIAS). The NPIAS is the federal airport classification system that includes public use airports that meet specific eligibility and activity criteria. A "NPIAS designation" is required for an airport to be eligible to receive FAA funding for airport projects.

Navigational Aid (Navaid) - Any visual or electronic device that helps a pilot navigate. Can be for use to land at an airport or for traveling from point A to point B.

Noise Contours – Continuous lines of equal noise level usually drawn around a noise source, such as runway, highway or railway. The lines are generally plotted in 5-decibel increments, with higher noise levels located nearer the noise source, and lesser exposure levels extending away from the source.

Non-directional Beacon (NDB) - Non-Directional Beacon which transmits a signal on which a pilot may "home" using equipment installed in the aircraft.

Non-Precision Instrument (NPI) Approach - A non-precision instrument approach provides horizontal (course) guidance to pilots for landing. NPI approaches often involve a series of "step down" sequences where aircraft descend in increments (based on terrain clearance), rather than following a continuous glide path. The pilot is responsible for maintaining altitude control between approach segments since no "vertical" guidance is provided.

Obstacle Clearance Surface (OCS) – As defined by FAA, an approach surface that is used in conjunction with alternative threshold siting/clearing criteria to mitigate obstructions within runway approach surfaces. Dimensions, slope and placement depend on runway type and approach capabilities. Also know as Obstacle Clearance Approach (OCA).

Obstruction - An object (tree, house, road, phone pole, etc) that penetrates an imaginary surface described in FAR Part 77.

Obstruction Chart (OC) - A chart that depicts surveyed obstructions that penetrate an FAR Part 77 imaginary surface surrounding an airport. OC charts are developed by the National Ocean Service (NOS) based on a comprehensive survey that provides detailed location (latitude/longitude coordinates) and elevation data in addition to critical airfield data.

Parallel Taxiway – A taxiway that is aligned parallel to a runway, with connecting taxiways to allow efficient movement of aircraft between the runway and taxiway. The parallel taxiway effectively separates taxiing aircraft from arriving and departing aircraft located on the runway. Used to increase runway capacity and improve safety.

Passenger Facility Charge (PFC) – A user fee charged by commercial service airports for enplaning passengers. Airports must apply to the FAA and meet certain requirements in order to impose a PFC.

Pavement Condition Index (PCI) – A scale of 0-100 that is used to rate airfield pavements ranging from failed to excellent based on visual inspection. Future PCIs can be predicted based on pavement type, age, condition and use as part of a pavement maintenance program.

Pavement Strength or Weight Bearing Capacity – The design limits of airfield pavement expressed in maximum aircraft weight for specific and landing gear configurations (i.e., single wheel, dual wheel, etc.) Small general aviation airport pavements are typically designed to accommodate aircraft weighing up to 12,500 pounds with a single-wheel landing gear.

Portland Cement Concrete (PCC) – Rigid pavement used for airfield facilities (runways, taxiways, aircraft parking, helipads, etc.).

Precision Approach Path Indicator (PAPI) - A system of lights located by the approach end of a runway that provides visual approach slope guidance to aircraft during approach to landing. The lights typically show green if a pilot is on the correct flight path, and turn red of a pilot is too low.

Precision Instrument Runway (PIR) - A runway equipped with a "precision" instrument approach (descent and course guidance), which allows aircraft to land in bad weather.

Precision Instrument Approach – An instrument approach that provides electronic lateral (course) and vertical (descent) guidance to a runway end. A nonprecision instrument approach typically provides only course guidance and the pilot is responsible for managing defined altitude assignments at designated points within the approach.

Primary Runway - That runway which provides the best wind coverage, etc., and receives the most usage at the airport.

Primary Surface - One of the FAR Part 77 Imaginary Surfaces, the primary surface is centered on top of the runway and extends 200 feet beyond each end. The width is from 250' to 1,000' wide depending upon the type of airplanes using the runway.

Principal Fire Extinguishing Agent – Fire extinguishing agents that provide permanent control of fire through a fire-smothering foam blanket. Examples include protein foam, aqueous film forming foam and fluoroprotein foam.

Procedure Turn (PT) - A maneuver in which a turn is made away from a designated track followed by a turn in an opposite direction to permit an aircraft to intercept the track in the opposite direction (usually inbound).

Area Navigation (RNAV) - is a method of instrument flight navigation that allows an aircraft to choose a course within a network of navigation beacons rather than navigating directly to and from the beacons. Originally developed in the 1960, RNAV elements are now being integrated into GPS-based navigation.

Relocated Threshold – A runway threshold (takeoff and landing point) that is located at a point other than the (original) runway end. Usually provided to mitigate nonstandard runway safety area (RSA) dimensions beyond a runway end. When a runway threshold is relocated, the published length of the runway is reduced and the pavement between the relocated threshold and to the original end of the runway is not available for aircraft takeoff or landing. This pavement is typically marked as taxiway, marked as unusable, or is removed.

Required Navigation Performance (RNP) – A type of performance-based navigation system that that allows an aircraft to fly a specific path between two 3-dimensionally defined points in space. RNP approaches require on-board performance monitoring and alerting. RNP also refers to the level of performance required for a specific procedure or a specific block of airspace. For example, an RNP of .3 means the aircraft navigation system must be able to calculate its position to within a circle with a radius of 3 tenths of a nautical mile. RNP approaches have been designed with RNP values down to .1, which allow aircraft to follow precise 3 dimensional curved flight paths through congested airspace, around noise sensitive areas, or through difficult terrain.

Rigid Pavement – Typically constructed of Portland cement concrete (PCC), consisting of a slab placed on a prepared layer of imported materials.

Rotorcraft - A helicopter.

Runway – A defined area intended to accommodate aircraft takeoff and landing. Runways may be paved (asphalt or concrete) or unpaved (gravel, turf, dirt, etc.), depending on use. Water runways are defined takeoff and landing areas for use by seaplanes.

Runway Bearing – The angle of a runway centerline expressed in degrees (east or west) relative to true north.

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

Runway Designation Numbers – Numbers painted on the ends of a runway indicating runway orientation (in degrees) relative to magnetic north. “20” = 200 degrees magnetic, which means that the final approach for Runway 20 is approximately 200 degrees (+/- 5 degrees).

Runway End Identifier Lights (**REILs**) - Two high-intensity sequenced strobe lights that help pilots identify a runway end during landing in darkness or poor visibility.

Runway Incursion – 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 aircraft.

Runway Object Free Area (OFA) – A defined area surrounding a runway that should be free of any obstructions that could in interfere with aircraft operations. The dimensions for the OFA increase for runways accommodating larger or faster aircraft.

Runway Protection Zone (RPZ) – A trapezoid-shaped area located beyond the end of a runway that is intended to be clear of people or built items. The geometry of the RPZ often coincides with the inner portion of the runway approach surface. However, unlike the approach surface, the RPZ is a defined area on the ground that does not have a vertical slope component for obstruction clearance. The size of the RPZ increases as runway approach capabilities or aircraft approach speeds increase. Previously defined as “clear zone.”

Runway Reference Code (RRC) – A code signifying the current operational capabilities of a runway and associated parallel taxiway.

Runway Safety Area (RSA) – A defined surface surrounding the runway, prepared or suitable for reducing risk of damage to aircraft in the event of an undershoot, overshoot, or excursion from the runway. The dimensions for the RSA increase for runways accommodating larger or faster aircraft. FAA standards include surface condition (compaction, etc.) and absence of obstructions. Any items that must be located within an RSA because of their function (runway lights, airfield signage, wind cones, etc.) must be frangible (breakable) to avoid significant aircraft damage.

Segmented Circle - A system of visual indicators designed to show a pilot in the air the direction of the traffic pattern at that airport.

Small Aircraft - An aircraft that weighs 12,500 lbs or less.

Straight-In Approach – An instrument approach that directs aircraft to a specific runway end.

Statute Mile – 5,280 feet (a nautical mile = 6,080 feet)

Stop and Go – An aircraft operation where the aircraft lands and comes to a full stop on the runway before takeoff is initiated.

T-Hangar – A rectangular aircraft storage hangar with several interlocking "T" units that minimizes - building per storage unit. Usually two-sided with either bi-fold or sliding doors.

Takeoff Distance Available (TODA) – the length of the takeoff run available plus the length of clearway, if available.

Takeoff Run Available (TORA) – the length of runway available and suitable for the ground run of aircraft when taking off.

Taxilane – A taxiway designed for low speed and precise taxiing. Taxilanes are usually, but not always, located outside the movement area, providing access from taxiways (usually an apron taxiway) to aircraft parking positions and other terminal areas.

Taxiway – A defined path used by aircraft to move from one point to another on an airport.

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

Taxiway Safety Area (TSA) – A defined surface alongside the taxiway prepared or suitable for reducing risk of damage to an aircraft deviating from the taxiway.

Threshold – The beginning of that portion of a runway that is useable for landing.

Threshold Lights – Components of runway edge lighting system located at the ends of runways and at displaced thresholds. Threshold lights typically have split lenses (green/red) that identify the beginning and ends of usable runway.

Through-the-Fence – Term used to describe how off-airport aviation users (private airparks, hangars, etc.) access an airport "through-the-fence," rather than having facilities located on airport property.

Tiedown - A place where an aircraft is parked and "tied down." Surface can be grass, gravel or paved. Tiedown anchors may be permanently installed or temporary.

Touch and Go – An aircraft operation involving a landing followed by a takeoff without the aircraft coming to a full stop or exiting the runway.

Traffic Pattern - The flow of traffic that is prescribed for aircraft landing and taking off from an airport. Traffic patterns are typically rectangular in shape, with upwind, crosswind, base and downwind legs and a final approach surrounding a runway.

Traffic Pattern Altitude - The established altitude for a runway traffic pattern, typically 800 to 1,000 feet above ground level (AGL).

Transitional Surfaces - One of the FAR Part 77 Imaginary Surfaces, the transitional surface extend outward and upward at right angles to the runway centerline and the extended runway centerline at a slope of 7:1 from the sides of the primary surface and from the sides of the approach surfaces.

Universal Communications (UNICOM) is an air-ground communication facility operated by a private agency to provide advisory service at uncontrolled airports.

Unmanned Aircraft Systems (UAS) is an unmanned aircraft that is remotely controlled. Small UAS are regulated by FAA under FAR Part 107. There are currently five groups of UAS ranging from less than 20 pounds to greater than 1,320 pounds. Also referred to as unmanned aerial vehicles (UAV) and drones.

Utility Runway – As defined under FAR Part 77, a runway designed and constructed to serve small planes (aircraft with maximum takeoff weights of 12,500 pounds or less).

Vertical Navigation (VNAV) – Vertical navigation descent data or descent path, typically associated with published GPS instrument approaches. The use of any VNAV approach technique requires operator approval, certified VNAV-capable avionics, and flight crew training.

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

VOR - Very High Frequency Omnidirectional Range – A ground based electronic navigational aid that transmits radials in all directions in the VHF frequency spectrum. The VOR provides azimuth guidance to aircraft by reception of radio signals.

VORTAC – VOR collocated with ultra high frequency tactical air navigation (TACAN)

Visual Approach Slope Indicator (VASI) - A system of lights located by the approach end of a runway which provides visual approach slope guidance to aircraft during approach to landing. The lights typically show some combination of green and white if a pilot is on the correct flight path, and turn red of a pilot is too low.

Visual Flight Rules (VFR) - Rules that govern the procedures to conducting flight under visual conditions. The term is also used in the US to indicate weather conditions that are equal to or greater than minimum VFR requirements. In addition, it is used by pilots and controllers to indicate type of flight plan.

Visual Guidance Indicator (VGI) – Equipment designed to provide visual guidance for pilots for landing through the use of different color light beams. Visual Approach Slope Indicators (VASI) and Precision Approach Path Indicators (PAPI) defined above are examples.

Waypoint – A specified geographical location used to define an area navigation route or the flight path of an aircraft ility, employing area navigation.

Wide Area Augmentation System (WAAS) – GPS-based instrument approach that can provide both vertical (glideslope) and horizontal (course) guidance. WAAS-GPS approaches are able to provide approach minimums nearly comparable to a Category I Instrument Landing System (ILS).

Wind Rose - A diagram that depicts observed wind data direction and speed on a 360-degree compass rose. Existing or planned proposed runway alignments are overlain to determine wind coverage levels based on the crosswind limits of the design aircraft.

Wind Cone – A device located near landing areas used by pilots to verify wind direction and velocity. Usually manufactured with brightly colored fabric and may be lighted for nighttime visibility. Also referred to as “wind sock.”

List of Acronyms

AC – Advisory Circular
AC – Asphaltic Concrete
ADG – Airplane Design Group
ALP – Airport Layout Plan
ALS – Approach Lighting System
ANM – FAA Northwest-Mountain Region
APL – Aircraft Parking Line
ARC – Airport Reference Code
ARP - Airport Reference Point
ASDA – Accelerate-Stop Distance Available
ASV – Annual Service Volume
ATCT – Air Traffic Control Tower
ASOS – Automated Surface Observation System
AWOS – Automated Weather Observation System
BRL – Building Restriction Line
CTAF – Common Traffic Advisory Frequency
FAA – Federal Aviation Administration
FAR – Federal Air Regulation
FBO – Fixed Base Operator
GPS – Global Positioning System
HIRL – High Intensity Runway Lighting
IFR – Instrument Flight Rules
IMC – Instrument Meteorological Conditions
LDA – Landing Distance Available
LDA - Localizer Directional Aid
LIRL – Low Intensity Runway Lighting
MIRL – Medium Intensity Runway Lighting
MITL - Medium Intensity Taxiway Lighting
NAVAID – Navigational Aid
NEPA – National Environmental Policy Act
OCS – Obstacle Clearance Surface
OFA – Object Free Area
OFZ – Obstacle Free Zone
PAPI – Precision Approach Path Indicator
PCC – Portland Cement Concrete
PCI – Pavement Condition Index
RDC – Runway Design Code
REIL – Runway End Identifier Lights
RPZ – Runway Protection Zone
RRC – Runway Reference Code
RSA – Runway Safety Area
RVZ – Runway Visibility Zone
TSA- Taxiway Safety Area
TSA – Transportation Security Administration
TODA – Takeoff Distance Available
TORA – Takeoff Run Available
UAS – Unmanned Aircraft Systems
UGA – Urban Growth Area
UGB – Urban Growth Boundary
UNICOM – Universal Communications
VASI – Visual Approach Slope Indicator
VFR – Visual Flight Rules
VGI - Visual Guidance Indicators

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