OREGON AVIATION PLAN AIRPORT SUMMARY
PORTLAND INTERNATIONAL AIRPORT

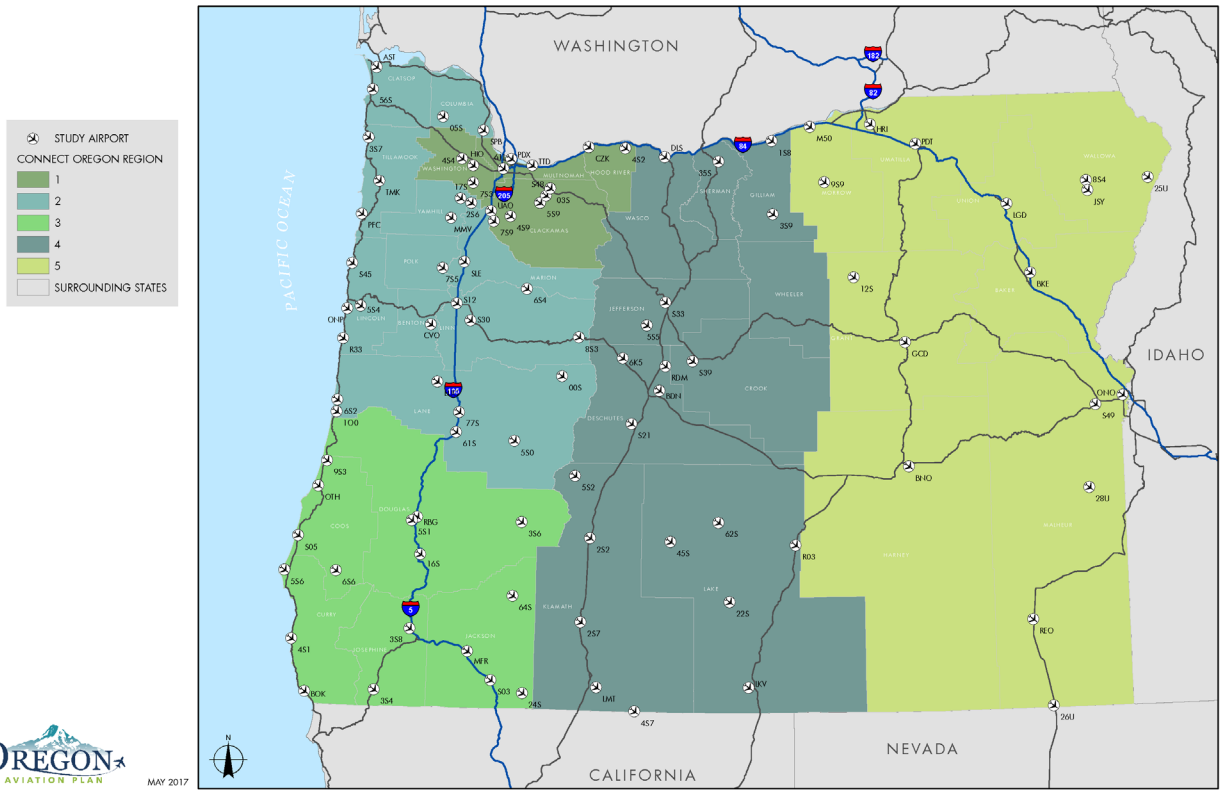
In 2018, the Oregon Department of Aviation (ODA) updated the Oregon Aviation Plan (OAP v6.0) for the state airport system which includes 95 airports, one heliport and one seaplane base. The study area was statewide and considered both commercial service and general aviation airports. Airports outside of Oregon in proximity to the state were considered as well. The study includes Portland International Airport (PDX or the Airport). This section focuses on the system plan's individual findings and recommendations for this facility as well as documenting the various benefits the Airport provides in Oregon.

Aviation system plans are top down studies that must be implemented from the bottom up by individual airports. The ultimate success of the plan depends on each airport implementing recommendations from the study and following through on any identified improvement actions. Individual airport improvements will result in the enhancement of overall system performance.

Within the statewide system, the Portland International Airport has been designated as a Category I – Commercial Service Airport in the 2007 OAP. Within the OAP, these airports support some level of scheduled commercial airline service in addition to supporting a full range of general aviation aircraft activities. Commercial service includes both domestic and international destinations.

From a facilities standpoint, the Portland International Airport meets most of the objectives for an OAP Category I Airport. It is worth noting, however, that the Airport's own capital improvement plan and/or master plan may recommend additional projects that it will be needed over the coming 10 years. The OAP also does not identify all maintenance, rehabilitation, and replacement costs that could be incurred by the Airport during this period.

EXISTING OREGON AIRPORT SYSTEM 2018



More information on the OAP can be obtained from the ODA Aviation website at https://www.oregon.gov/aviation/pages/index.aspx. In addition to the complete Technical Report, a statewide Executive Summary was produced to support the OAP. More information on all OAP-related products can be obtained from ODA.

OREGON AIRPORT ROLES/CATEGORIES

ODA's Oregon Aviation Plan was last published in 2007. This update to the OAP re-sets the bar for future system performance by evaluating each airport's facilities and services. Since 2007, a number of Oregon airports have made progress toward meeting various performance measures. As part of this study, airport infrastructure data, aviation activity projections and population growth in each airport's environs were used to determine whether the airport should be elevated to a higher OAP Category to improve overall system accessibility and performance. The OAP v6.0 also addressed the need for airports to support resiliency efforts related to a potential Cascadia Earthquake and Tsunami Event.

Recommended categories for airports in the Oregon Aviation Plan are shown below.

OAP AIRPORT CATEGORIES
RECOMMENDED OREGON AIRPORT ROLES

Category I	**Commercial Service Airport**: These airports support some level of scheduled commercial airline service in addition to supporting a full range of general aviation aircraft activities. Commercial service includes both domestic and international destinations. Objectives call for a minimum runway length of 6,000 feet.
Category II	**Urban General Aviation Airport**: These airports support all general aviation aircraft and accommodate corporate aviation activity, including piston and turbine engine aircraft, business jets, helicopters, gliders, and other general aviation activity. The most demanding user requirements are business-related. These airports service a large/multi-state geographic region or experience high levels of general aviation activity. The minimum runway length objective for Category II airports is 5,000 feet.
Category III	**Regional General Aviation:** These airports support most twin and single-engine aircraft and may accommodate occasional business jets. These airports support regional transportation needs with a large and often sparsely populated service area. The minimum runway length objective for Category III airports is 4,000 feet.
Category IV	**Local General Aviation Airport:** These airports support primarily single-engine general aviation aircraft but are capable of accommodating smaller twin-engine general aviation aircraft. These airports support local air transportation needs and special-use aviation activities. The minimum runway length objective for Category IV airports is 3,000 feet.
Category V	**Remote Access/Emergency Services (RAES):** These airports support primarily single-engine general aviation aircraft, special-use aviation activities, access to remote areas, or provide emergency service access. These airports should have at least 2,500 feet of runway.

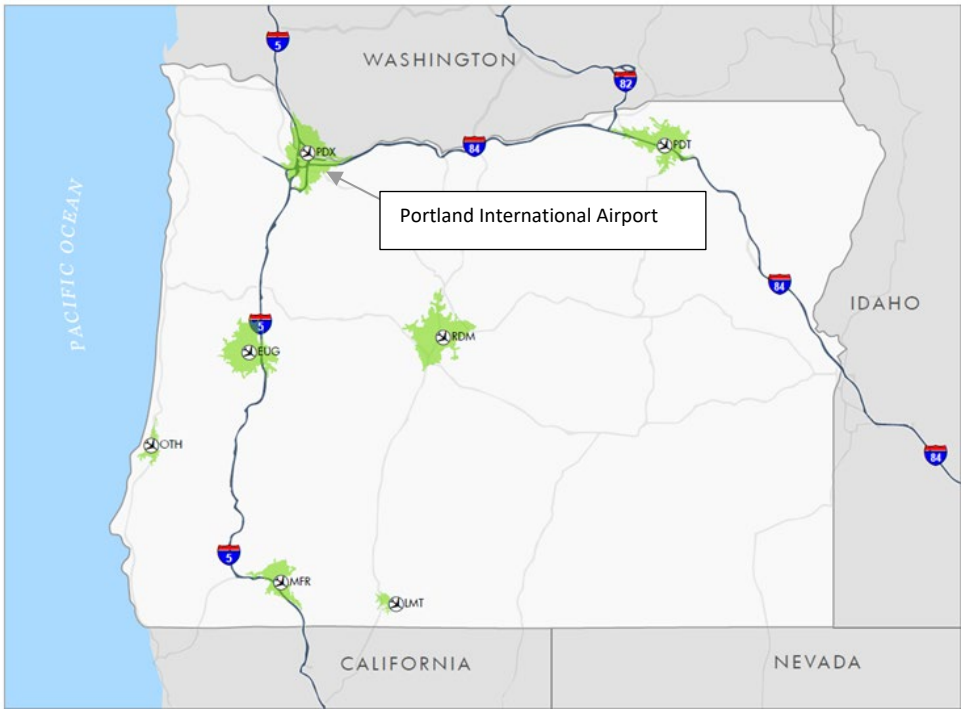
Source: Jviation

PORTLAND INTERNATIONAL AIRPORT OVERVIEW

Portland is the largest city in Oregon. Portland International Airport, which is situated on the Columbia River, approximately four miles northeast of Portland, encompasses approximately 3,000 acres. The Airport is a Primary Commercial Service airport, serving long haul markets. Nearby points of interest include the Moda Center (formerly known as the Rose Garden), home of the Portland Trail Blazers; Oregon Convention Center; Portland Art Museum; Oregon Museum of Science and Industry; and the Oregon Zoo. Metropolitan Portland is the economic center for Oregon and southwest Washington; the region is home to more than 2.3 million residents and numerous major industry clusters. Major employers in the area include Intel, Nike, Daimler Trucks, Precision Castparts, Boeing, Columbia Sportswear, Northwest Pipe, Mentor Graphics, Tektronix, Xerox, Adidas, IBM, Georgia Pacific, and Rockwell Collins, among many others. The Airport is the busiest in the state, with more than 228,000 operations in 2017. The Airport is served by numerous airlines including Aero México, American, Air Canada, Alaska, Boutique Air, Condor, Delta, Frontier, Hawaiian, Icelandair, JetBlue, Southwest, Spirit, Sun Country, United, and Volaris. These airlines served more than 9.4 million passengers in 2017 with nonstop service to nearly 60 destinations. Of the more than 228,000 operations that occurred at the Airport, approximately 16,000 were conducted by general aviation aircraft. There are an estimated 77 based aircraft at Portland International Airport.

The primary runway, Runway 10R/28L, is 11,000 feet long and 150 feet wide. This precision approach runway is equipped with HIRL, REILs, VASIs, ALSF2/MALSR, centerline lights, and touchdown zone lights. Runway 10L/28R is 9,825 feet long and 150 feet wide with a precision approach. This runway is equipped with HIRL, MALS, VASIs, and ALSF1. The crosswind runway, Runway 3/21, measures 6,000 feet in length by 150 feet in width. This runway is equipped with MIRL, REILs, and VASIs. There are a number of published approaches available to the Airport including a CAT III Its approach to Runway 10R.

30-MINUTE DRIVE TIME SERVICE AREA AND POPULATION
OAP CATEGORY I AIRPORTS



Source: Jviation

Airport roles consider the characteristics of the area the Airport serves. Analysis for the OAP was conducted using a geographic information system (GIS) and a 30-minute drive time for each airport. There are approximately 987,465 residents within a 30-minute drive of Portland International and a labor force of approximately 543,705.

Portland International Airport	
Population	
2016 30-minute drive	987,465
2016 Associated city	641,544
Labor force	
2016 30-minute drive	543,705

Source: US Census Bureau, Jviation Analysis, Oregon Zoomprospector.com, Oregon Population Center – Portland State University

RECOMMENDED ROLE FOR PORTLAND INTERNATIONAL AIRPORT

Each airport's level generally reflects the type of aircraft and customers the airport serves as well as the characteristics of the airport's service area. Portland International Airport will remain a Category I – Commercial Service Airport within the OAP.

As a Category I airport, the OAP has identified certain facilities and services that should ideally be in place. These objectives are considered the "minimums" to which the Airport should be developed. Based on local needs and other justifications, it is quite possible that the Airport could exceed its minimum development objectives established in the OAP. Portland International Airport's specific objectives, as they pertain to the Airport's Category I role in the state airport system, are listed below.

OBJECTIVES FOR CATEGORY I – COMMERCIAL SERVICE MINIMUM STANDARD

Airside Facilities

- **Airport ARC:** C-II
- **NPIAS:** Yes
- **Based Aircraft:** Not an Objective
- **Runway orientation:** 95% wind coverage (combined primary/secondary rwy)
- **Runway Pavement Type:** Bituminous, Concrete
- **Runway Pavement Strength:** Varies by Airport*/Design Aircraft
- **Runway length:** Minimum 6,000 feet
- **Runway width:** 100 feet
- **Taxiway:** Full parallel
- **Lighting systems:** MIRL/HIRL/ALS
- **Approach:** Precision w/ vertical guidance
- **Visual Approach Aids:** Both Runway Ends
- **Instrument Approach Aids:** One Runway End
- **Runway Lighting:** MIRL/HIRL/ALS
- **Taxiway Lighting:** MITL/HITL
- **Fencing:** Perimeter; controlled access

General Aviation Facilities

- **Rotating Beacon:** Yes
- **Weather reporting:** AWOS or ASOS
- **Lighted Wind Indicator:** Yes
- **Hangared aircraft storage:** 75% of based aircraft fleet
- **Apron parking/storage:** 75% of Daily Transient
- **Terminal/Building:** Yes
- **Auto parking:** Moderate
- **Cargo:** Small Handling Facility w/ Apron
- **Deicing Facility:** Yes

Services

- **Fuel:** 100 LL (24-hour self-service) & Jet A
- **FBO:** Full Service (normal business hours)
- **Transportation:** Offsite Rental Car, Taxi, etc.
- **Food Service:** Coffee Shop/Deli & Cold Foods
- **Restrooms:** Yes
- **Pilot Lounge:** Yes w/ Weather Reporting Station
- **Snow Removal:** Yes
- **Telephone:** Yes

PORTLAND INTERNATIONAL AIRPORT
PROJECTIONS OF GENERAL AVIATION DEMAND

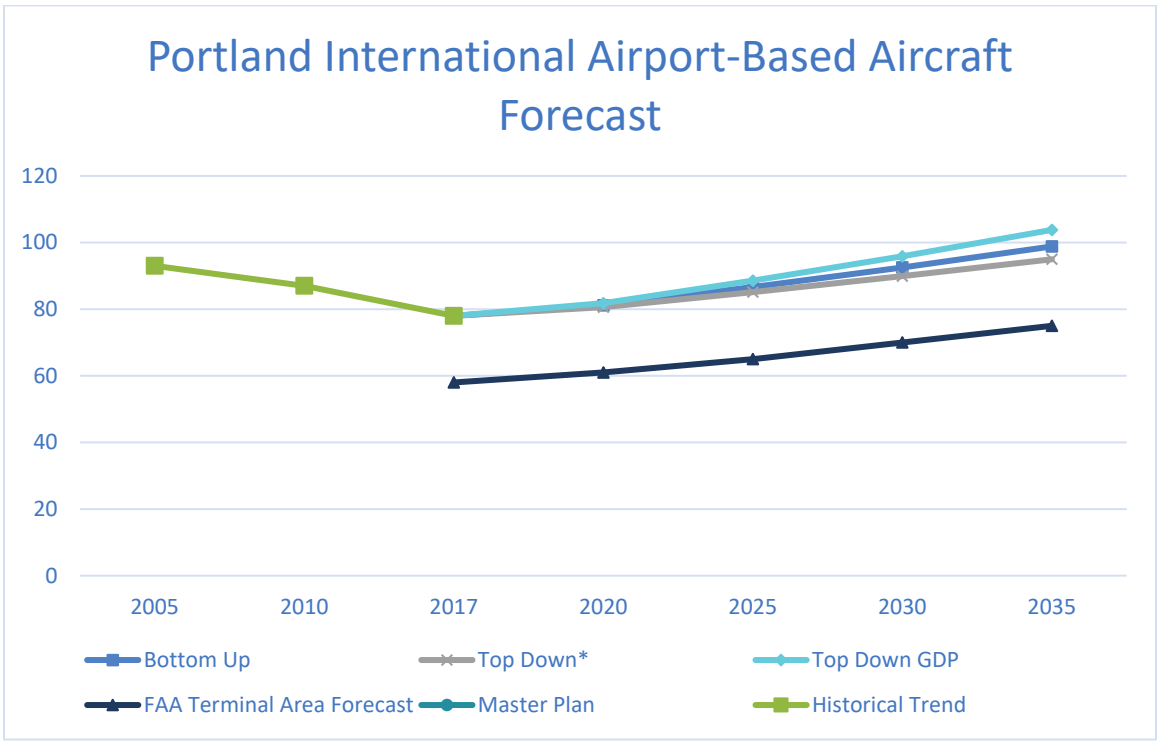
Over the past 10 years, general aviation has experienced a general decline on a nationwide basis and in Oregon. The high cost of acquiring and maintaining a general aviation aircraft, the cost to secure a private pilot's license, competing opportunities for allocation of disposable income, the economic recession, along with significant increases in the cost of aviation fuel, have all contributed to a contraction in general aviation demand.

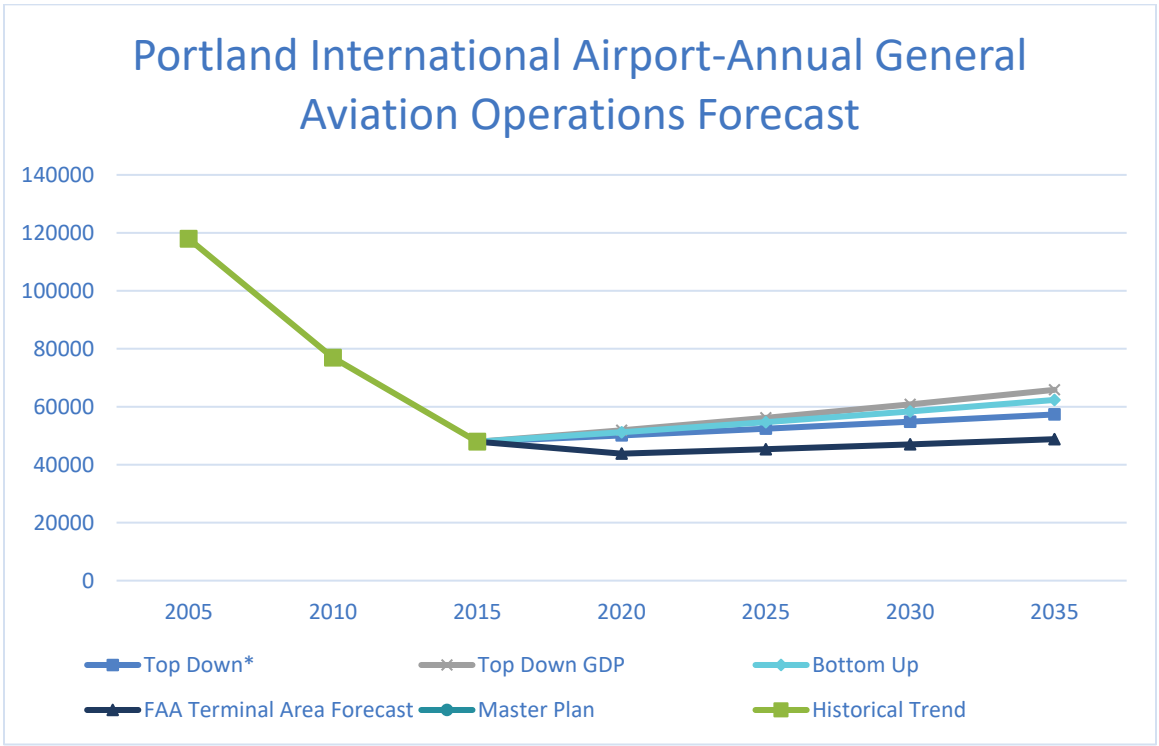
Recent economic recovery and increased use of general aviation as a tool to improve business efficiency have helped to stabilize the general aviation industry. For most airports in Oregon, however, including Portland International Airport, anticipated growth in general aviation demand will be modest at best. The two graphs below show projections of based aircraft and annual general aviation operations for PDX as they were developed in the OAP v6.0.

Three based aircraft projection methodologies were developed in this forecast. The bottom-up methodology produced an average annual growth rate of 1.0 percent and the top-down methodology based on historical Per Capita Real GDP produced the highest average annual growth rate, of the three projections, at 1.6 percent. The alternative top-down methodology utilizing FAA Terminal Area Forecast (TAF) projections for NPIAS airports in Oregon produced more moderate growth rate. Comparing the results of the forecasts indicated that the historical Per Capita Real GDP projection had the strongest growth, but was considered to be overly optimistic, since sustaining a 1.6 percent GDP growth rate over the planning period is unlikely. Therefore, the more conservative bottom-up growth rate of 1.1 percent, which is based on FAA TAF growth rates for based aircraft, was chosen as the preferred forecast. Based aircraft at PDX are projected to increase from 78 in 2017 to 95 by 2035.

The results from the three general aviation operations projection methodologies developed in this forecast are compared in the graphs below. The bottom-up methodology produced an average annual growth rate of 1.1 percent while the top-down methodology based on FAA Hours Flown projections produced an average annual growth rate of 0.9 percent. The alternative top-down methodology based on historical GDP growth produced an average annual growth rate of 1.6 percent. The bottom-up growth rate of 0.9 percent was chosen as the preferred growth rate since it is based on FAA national average growth forecasted for hours flown. Annual general aviation aircraft operations[1] at PDX are projected to increase from 47,928 to 57,334 by 2035.

[1] Includes air taxi and commuter operations





Source: FAA TAF, Jviation analysis
* indicates preferred growth rate, No master plan growth rate used

PORTLAND INTERNATIONAL AIRPORT
ECONOMIC IMPACT UPDATE

In fiscal year 2015, passenger and air freight activity at PDX had the following reported impacts:

- 17,756 direct and induced/indirect jobs were supported for residents of the Portland area. Of the 17,756, jobs, 10,574 were direct jobs, while 5,013 jobs were induced throughout the region, supported by the purchase of goods and services by the 10,574 direct employees. An additional 2,169 indirect jobs were also supported in the local economy, as a result of $205 million in local purchases by firms directly dependent on the Airport.
- $1.0 billion of direct and induced/indirect personal earnings and consumption expenditures were generated in the Portland area.
- Over $4.9 billion in business revenue was supported.
- The federal government received $309 million in airport-specific taxes.
- State and local governments received $102 million in tax revenues.

PORTLAND INTERNATIONAL AIRPORT

	Direct	Indirect/Induced	Total
On-Airport Tenants			
– **Employment**	10,574	7,182	17,756
– **Payroll**	$485,000,000	$546,000,000	$1,031,000,000
– **Sales/Output**			$4,929,000,000
Visitor Impacts			
– **Employment**	63,281	36,070	99,351
– **Payroll**	$1,603,000,000	$1,911,000,000	$3,514,000,000
– **Sales/Output**			$5,870,000,000
Total Impacts			
– **Employment**	73,855	43,252	117,107
– **Payroll**	$2,088,000,000	$2,457,000,000	$4,545,000,000
– **Sales/Output**			$10,799,000,000

Source: The Local and Regional Economic Impacts of The Port of Portland, 2015

In addition to these airport-supported impacts, it is estimated that 99,351 direct and induced/indirect jobs were supported in the Portland area visitor industry due to expenditures by the 4.8 million visitors who arrived via PDX. The impacts from visitor spending were estimated from the results of an on-going passenger survey conducted at PDX. Domestic and international visitors to Oregon, arriving via PDX, spend about $5.9 billion (direct, indirect, induced) on area hotels, restaurants, retail stores, and entertainment establishments. This spending in turn supported other jobs in the Portland area visitor industry; $314 million in state and local tax revenues were generated as a result of spending from visitors arriving via PDX.

Total economic impact of PDX in 2015 was estimated at $10.8 billion. The 117,000 total full-time equivalent employees are estimated to have a total payroll associated of $4.5 billion.

MUNICIPALITIES NEAR PORTLAND INTERNATIONAL AIRPORT WITH LAND USE CONTROLS

Having land uses adjacent to airports that are compatible with aircraft operations is imperative from a safety standpoint. Airports that accept state and/or federal grants are obligated to take steps to promote compatible land use and activities in the environs of their airport. For the OAP analysis, airports and their immediate or adjacent municipalities in the environs of the airport were identified. Analysis of each airport's airspace were compared to local jurisdiction boundaries on Google Earth. If a jurisdiction was entirely or partly under the airport's airspace local zoning ordinances were reviewed. County land use ordinances related to airports and height restrictions were also analyzed.

Research was undertaken for municipalities identified during the OAP to determine if the municipalities are taking steps to promote compatible land use and protect the operating environments for airports. Municipalities near Oregon airports were investigated to determine the following key land uses controls:

- **Has the municipality adopted land use zoning controls?**
- **Does the municipality have an airport-specific overlay zone or district?**
- **Does the municipality have a land use map that shows the location of the airport?**
- **Has the municipality adopted some type of height zoning?**

The following table shows municipalities near Portland International Airport and summarizes the status of land use controls for each. Municipalities and airports throughout Oregon should work together to help ensure airports are protected from incompatible land uses and from the encroachment of obstacles that pose a height hazard to safe airport operations.

LAND USE CONTROL SUMMARY FOR PORTLAND INTERNATIONAL AIRPORT

Type of Control	Jurisdictions Impacting Airport	
	City of Portland	Multnomah County
Airport Zone	Yes	No
Adopted Height Zoning Restrictions	Yes	Yes
RPZ Protection	Yes	No
Airport Safety Overlay Zone	Yes	Yes

Source: Angelo Planning Group, Jviation

AIRPORT REPORT CARD AND RECOMMENDATIONS

This section provides information on ODA facility/service objectives associated with a Category I airport in the OAP. The report card shows Portland International Airport's ability to meet its objectives. If the Airport does not meet an objective, an estimated cost to enable the Airport to meet the objective was developed.

The report card for Portland International Airport, developed as part of the OAP, is shown below. Only one deficiency, 24-hour AvGas, was identified as necessary for improving the Airport to meet all the facility objectives.

Category I Performance Criteria		PDX	Portland International Airport	Portland
Facilities	**Basic Criteria**	**Actual**	**Action Needed to Meet Criteria**	**Estimated Cost**
Airside Facilities				
FAA – ARC	C-II	D-V		
NPIAS	Yes	Yes		
Based Aircraft	Not an Objective	78		
Runway Orientation	95% wind coverage (combined primary/secondary rwy)	Yes		
Runway Length	6,000 feet	11,000		$ -
Runway Width	100 feet	150		$ -
Runway Pavement Type	Bituminous, Concrete	Concrete		
Runway Pavement	Varies by Airport*/Design Aircraft	200,000		$ -
Runway Pavement PCI	65			$ -
Taxiways	Full Parallel	Full Parallel		$ -
Approach Type	Precision	Precision		$ -
Visual Approach Aids	Both Runway Ends	PAPI, REIL		
Instrument Approach	One Runway End	MALSR, ALSF, TDZL		
Runway Lighting	MIRL/HIRL/ALS	HIRL		
Taxiway Lighting	MITL/HITL	MITL		$ -
General Facilities				
Rotating Beacon	Yes	Yes		$ -
Lighted Wind Indicator	Yes	Wind Cone, Lighted Wind		$ -
Weather Reporting	AWOS/ASOS	ASOS		$ -
Hangared Aircraft	75% of Based Aircraft	90%		$ -
Apron Parking/Storage	75% of Daily Transient	100%		$ -
Terminal Building	Yes	Yes		$ -
Auto Parking Spaces	Moderate	260		$ -
Fencing	Perimeter; controlled access	Entire airport perimeter with controlled access gates		$ -
Cargo	Small Handling Facility w/ Apron	Cargo facility/building with apron		$ -
Deicing Facility	Yes	Yes		$ -
Services				
Fuel	100 LL & Jet A (24-hour self-service)	No	Provide 24 hour self-service	$ 200,000
FBO	Full Service (normal business hours)	Yes		
Ground Transportation	Rental Car, Taxi, or Other	Onsite rental car, Uber/taxi		
Food Service	Coffee Shop/Deli & Cold Foods	Yes		
Restrooms	Yes	Yes		
Pilot Lounge	Yes w/ Weather Reporting Station	Yes		
Snow Removal	Yes	Yes		$ -
Telephone	Yes	Yes		
Total				**$ 200,000**

Source: Jviation, Century West, Marr Arnold Planning

OTHER IDENTIFIED FACILITY IMPROVEMENT COSTS

Projects identified in the deficiencies analysis from the OAP represent a portion of the total development and maintenance costs that Oregon airports could require in the near term. In order to have a better picture of total investment needs for Oregon's airport system, it is important to also consider projects identified in each airport's current Statewide Capital Improvement Program (SCIP) and in Oregon's most recent Statewide Pavement Maintenance Program (PMP).

SCIP: Current SCIPs were reviewed to provide ODA with a general understanding of what projects are already being considered on the local level that would address deficiencies noted in the OAP. A review was performed to ensure project costs were not duplicated between the OAP and current SCIP projects for each airport. Analysis of 2018 SCIP data indicates that nearly $39.7 million in improvements for PDX are identified in the SCIP over the next five to ten years. This estimate does not include transfers or PMP funds.

PMP: ODA's Pavement Maintenance Program (PMP) identifies maintenance, repair, and rehabilitation projects needed to sustain functional pavements at Oregon airports. The PMP program provides some level of pavement maintenance for all paved airports across the state. For NPIAS airports receiving federal monies, this work assists the airports in meeting their grant assurances. Since PDX is a Primary airport with AIP entitlement funding the Airport is not included in the ODA PMP.

Cost Summary: The OAP v6.0 summarized the Airport's development needs over the next five to ten years. Costs to improve and maintain the Airport over that time frame consider not only projects identified by the OAP, but also projects and the Airport's own locally generated capital improvement plan reported to ODA (SCIP). These two sources indicate an estimated $39.9 million will be needed to maintain and improve the Airport over the next five to ten years.

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