

## 6. SPECIAL CONSIDERATIONS

### 6.1 Introduction

This chapter addresses special considerations related to unique aspects of Oregon’s system of airports. These considerations address new trends in Oregon aviation activity and each topic is considered to various extents in **Chapter 5, System and Airport Evaluation**. Topics addressed in this chapter include:

- Airport System Resilience
- Airports with scheduled air cargo service
- State-owned airports
- State Warning Airports
- Gaps in geographic coverage
- Aviation System Action Program (ASAP) and Rural Oregon Airport Relief Program (ROAR)
- Unmanned Aerial Vehicles (UAVs)

### 6.2 Airport System Resilience

The extensive aviation system in Oregon is a crucial asset to the state during times of emergency. Airports enable emergency rescue crews to quickly access remote or hard-hit areas, and supply resources to and evacuate areas that may otherwise be unreachable via roadway, boat, and rail. As such, this study included an inventory of airports that support emergency services. Further, this study inventoried airports located within the Cascadia subduction zone (CSZ) that may be impacted or destroyed during a zone event. This study did not include an in-depth resiliency study but rather a high-level overview of airports that currently provide emergency services and those that may likely be unable to provide such service following a Cascadia subduction zone event<sup>1</sup>.

#### 6.2.1 Airport Roles in the 2013 Oregon Resilience Plan

Oregon emergency management officials and lawmakers recognize the vulnerability of airports and the communities they serve to potential earthquake events. Oregon has established the Oregon Seismic Safety Policy Advisory Commission (OSSPAC) which provided the Oregon Resilience Plan to the 77<sup>th</sup> Legislative Assembly<sup>2</sup>. The authors of the 2013 Oregon Resilience Plan set out to help Oregonians know what to expect from the state’s infrastructure should that disaster strike currently, and to propose the level of infrastructure reliability that a resilient state should provide. The Plan’s recommendations highlight ways to close the gap that separates expected and desired performance. The Transportation Task Group assessed the seismic integrity of Oregon’s multi-modal transportation system, including bridges and highways, rail, airports, ports, seaports, and public transit systems. The Plan identified 30 airports in Oregon that can support recovery efforts related to a CSZ event. As discussed in previous chapters of the Oregon Aviation Plan (OAP v6.0), 97 facilities grouped into five categories of airports comprise the Oregon airport system.

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<sup>1</sup> Oregon has the potential for a 9.0+ magnitude earthquake caused by the Cascadia Subduction Zone and a resulting tsunami of up to 100 feet in height that will impact the coastal area. <http://www.oregon.gov/oem/hazardsprep/Pages/Cascadia-Subduction-Zone.aspx>

<sup>2</sup> [https://www.oregon.gov/oem/Documents/Oregon\\_Resilience\\_Plan\\_Final.pdf](https://www.oregon.gov/oem/Documents/Oregon_Resilience_Plan_Final.pdf)



In 2017 an Airport Resiliency Workgroup was formed to further identify system airports within each category that have the potential to maintain or quickly restore operational functions after a major earthquake. The Workgroup was formed by the House of Representatives and the membership consisted of individuals from the Department of Aviation, the Office of Emergency Management, the State Resilience Office, and the Oregon Pilots Association. The Airport Resiliency Workgroup arranged the 30 airports into a tier system to indicate the priorities for making future investments.

It is also important to point out that the FAA re-authorization bill allows for additional studies related to airport master plans to include emergency and disaster preparedness.<sup>3</sup> This will allow NPIAS airport in Oregon to have additional analysis in their airport master plans related to evacuations and airport role in emergencies. In April 2018 the following was added to Section 47106 of title 49, United States Code, (amended by adding at the end the following):

- “(h) EVALUATION OF AIRPORT MASTER PLANS. —When evaluating the master plan of an airport for purposes of this subchapter, the Secretary shall take into account—
  - “(1) the role the airport plays with respect to medical emergencies and evacuations; and
  - “(2) the role the airport plays in emergency or disaster preparedness in the community served by the airport.”

### *Tier Type and Base Concept*

#### **Tier 1 (ISB, BSI, or Type 1 FSA)**

Based on existing airports, Tier 1 (T1) are also referred to as Incident Staging Bases (ISB)(Federal Emergency Management Agency (FEMA)), Base Support Installation (BSI)(DOD), Type 1 Federal Staging Area (FSA)(FEMA), or National Guard Logistics Staging Base (NGLSB)(State). These are functioning as Aerial Port of Embarkation / Departure (APOE/D) for the response and simultaneously Tier 3 resupply points. They are capable of the full spectrum of response operations.

- Airfield Max Runway Strength 125,000 to 500,000 pounds
- Identified now
- Preplan usage now
- Pre-coordinate design now
- Acts as all Tiers
- Provides distribution to local communities
- Responder Base Camp (RBC)
- Joint reception, staging, onward movement, and integration (JRSOI)/ Relief in Place (RIP) Location

#### **Tier 2 (Type 2 FSA)**

Based on existing airports, Tier 2 (T2) are larger networks of airports that provide access to most rural areas and will be needed to restore major commercial operations. May also be referred to as Type 2 Federal Staging Areas (FSA). These function as forward APOE/D for the response and are simultaneously used as Tier 2 resupply points, and immediate area Tier 3s. They should be capable of the full spectrum of response operations.

- Airfield Max Runway Strength 25,000 to 125,000 pounds

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<sup>3</sup> [Congressional Record Volume 164, Number 68 (Thursday, April 26, 2018)] [House] [Pages H3643-H3688] amendment no. 61 offered by Mr. Kilmer of Washington, At the end of title V, insert the following: SEC. 543. EVALUATION OF AIRPORT MASTER PLANS.

- Identified now
- Preplan usage
- Pre-coordinate design
- Serves as logistics base and RBC
- Provides distribution to local communities
- JRSOI / RIP Location

**Tier 3 (Type 3 FSA w/Airport)**

Tier 3 (T3) bases come in two varieties: with or without airports. Both are located based on the forecast needs of their surrounding population and provide economic and commercial restoration to the entire region after a disaster event. Tier / Type 3 Base with Airport is a pre-identified location and is pre-coordinated with the airport manager.

- Airfield Max Runway Strength <20,000
- Identified now
- Preplan usage
- Pre-coordinate design
- Serves as log base and RBC
- Provides distribution to local communities
- Responder Base Camp
- JRSOI / RIP (-) Location

The Airport Resiliency Workgroup’s recommended organization of the 30 airports is depicted in **Table 6-1**.

TABLE 6-1: RECOMMENDED ORGANIZATION OF OREGON AIRPORTS

Tier 1 (ISB, BSI, or Type 1 FSA)	Tier 2 (Type 2 FSA)	Tier 3 (Type 3 FSA w/Airport)
Redmond (RDM) FEMA	Tillamook (TMK) 4	Bandon (S05)
Klamath Regional(KLM) 6	Corvallis (CVO)	Siletz Bay (S45)
Portland International Airport (PDX)	Scappoose (SPB)	Independence (7S5) 11
Salem McNary (SLE)	Roseburg (5S1)	Grants Pass (3S8)
Newport (ONP)	McMinnville (MMV)	Myrtle Creek (16S)
Eugene (EUG)	Albany (S12) 10	Cottage Grove (61S)
Medford (MFR)	Aurora (UAO) 9	Creswell (77S)
Hillsboro (HIO)	Troutdale (TTD)	Brooking (BOK)
Cape Blanco State (5S6)		Florence (6S2)
Pendleton (PDT)		Portland Heliport (61J)
		Mulino (4S9)
		Lebanon State (S30)

Source: Airport Resiliency Workgroup



FEMA requested that the State of Oregon prioritize 11 airports to have a federal assessment done<sup>4</sup>. As of March 2018, FEMA has assessed Redmond Municipal Airport (RDM). In 2019 Portland International Airport (PDX) and Salem Municipal Airport (SLE) are scheduled for FEMA assessment. The other airports that Oregon has prioritized include:

- Cape Blanco State Airport (5S6)
- Tillamook Airport (TMK)
- Eugene (EUG)
- Klamath (KLM)
- Hillsboro Airport (HIO)
- Aurora State Airport (UAO)
- Albany Airport (S12)
- Independence State Airport (7S5)

As shown in **Figure 6-1**, most airports in the Resilience Plan are along the Interstate 5 corridor and along the Oregon Coast, excepting Crater Lake-Klamath Regional, Eastern Oregon Regional Airport at Pendleton, and Redmond Regional Airports. Redmond is currently the designated FEMA base of operations, while Crater Lake-Klamath Regional has an Air National Guard base.

Additional research related to Oregon airports and a CSZ event has been recently conducted by the Airport Resiliency Workgroup. The Group was tasked with developing three white papers on airport resiliency: 1) Identify Airports: Identify airports as forward operating bases and tier them based on capability; 2) Prioritize Equipment: Outline and prioritize the categories of equipment that could be used in a CSZ event; 3) Identify Funding: Identify the major avenues of funding.

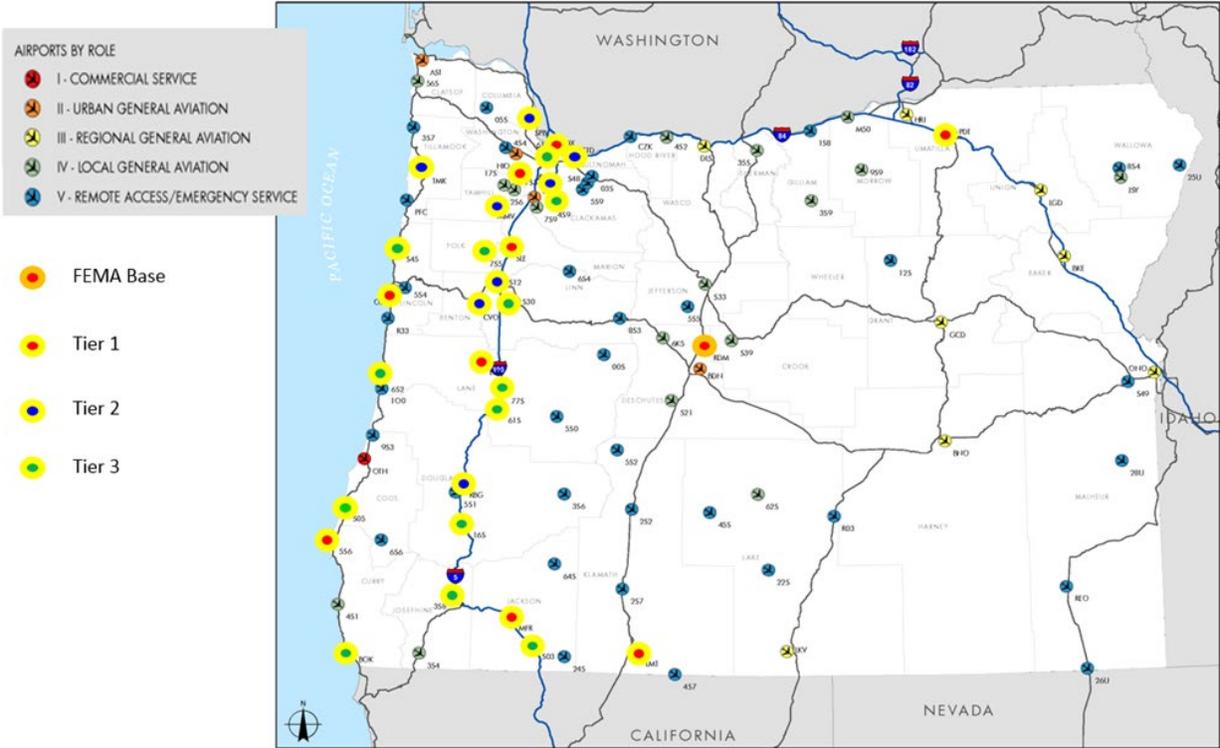
Analysis of Oregon Department of Geology and Mineral Industries (DOGAMI) data identifies airports within the study and their risk of earthquake damage, either through liquefaction<sup>5</sup> or Cascadia/Tsunami. It was determined that there are seven airports within a known coastal hazard area, all with both a liquefaction and Cascadia/Tsunami event hazard risk (see **Table 6-2**). None of these airports are listed as essential in the Oregon Resilience Plan and as such are not part of the Tier system.

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<sup>4</sup> Source for the FEMA list is from Legislative sub-committee of the Oregon Resiliency Work Group.

<sup>5</sup> Soil liquefaction describes a phenomenon whereby a saturated or partially saturated soil substantially loses strength and stiffness in response to an applied stress, usually earthquake shaking or other sudden change in stress condition, causing it to behave like a liquid.

FIGURE 6-1: AIRPORT RESILIENCY WORKGROUP – TIERED SYSTEM



Source: Airport Resiliency Workgroup, Jviation

TABLE 6-2: AIRPORTS WITHIN A KNOWN COASTAL HAZARD AREA

Airport Name	Liquefaction Hazard	Cascadia Event Hazard <sup>6</sup>
Port of Astoria Regional Airport	High	Severe
Gold Beach Municipal Airport	Moderate	Violent
Nehalem Bay State Airport	High	Severe
Pacific City State Airport	High	Severe
Seaside Municipal Airport	High	Severe
Southwest Oregon Regional Airport	High	Violent
Wakonda Beach State	Moderate	Severe

Source: <http://www.oregongeology.org/tsuclearinghouse/pubs-inumaps.htm>, Jviation analysis

6.2.2 Coastal Airports Supporting Cascadia/Tsunami Event

In addition to the airports located within a known coastal hazard area, it was determined that ten more airports are at risk of impacts resulting from an earthquake; due to the airports’ inland locations or higher elevations, they are located outside a known coastal hazard area related to tsunami (see Table 6-3). Appendix D profiles these airports’ attributes and locations. These airports have a higher probability of less damage by tsunami and can be utilized in the event of a natural disaster along the Oregon coast. Additionally, seven of the ten airports

<sup>6</sup> Violent shaking is greater than Severe shaking. In general, airports located closest to coast will likely experience greater shaking than airports higher in elevation and further from coast.

profiled are listed in the Oregon Resilience Plan (ORP) and have the potential to maintain or quickly restore operational functions after a major earthquake. It is important to note that an earthquake-generated tsunami may not be felt locally.<sup>7</sup>

TABLE 6-3: AIRPORTS OUTSIDE A KNOWN COASTAL HAZARD AREA

Airport Name	ORP Tier	Liquefaction Hazard <sup>8</sup>	Cascadia Event Hazard <sup>9</sup>
Bandon State Airport	T3	Moderate	Violent
Brookings Airport	T3	N/A	Severe
Cape Blanco State Airport	T1	Moderate	Violent
Florence Municipal Airport	T3	High	Severe
Lakeside Municipal Airport	NA	Moderate	Severe
Newport Municipal Airport	T1	Low	Severe
Powers Hayes Field	NA	Moderate	Severe
Siletz Bay State Airport	T3	Moderate	Severe
Tillamook Airport	T2	Moderate	Severe
Toledo State Airport	NA	Moderate	Severe

Source: <http://www.oregongeology.org/tsuclearinghouse/pubs-inumaps.htm>

Several of the airports listed in **Table 6-4** serve areas with significant population numbers. If an earthquake were to damage or leave any of these airports inoperable, the region and its residents may experience delayed emergency response. **Table 6-4** depicts these airports along with the population within a 30-minute drive, 20 miles, and within the city limits. It is important to note these airports are not included in a known coastal hazard area and may not be commonly associated with earthquake risks. **Figure 6-2** depicts the location of these airports.

TABLE 6-4: POPULATION NEAR AIRPORTS OUTSIDE A COASTAL HAZARD AREA

Airport Name <sup>10</sup>	Population within 30-minute Drive of Airport	Population within 20-mile Radius	Population within City Limits
Bandon State Airport	7,554	29,567	3,147
Brookings Airport	13,883	25,779	6,497
Cape Blanco State Airport	3,382	4,998	1,146
Florence Municipal Airport	15,006	17,530	8,703
Lakeside Municipal Airport	29,167	48,208	1,748
Newport Municipal Airport	24,298	34,539	10,344
Powers Hayes Field	891	7,638	660

<sup>7</sup> The last earthquake that occurred in this CSZ fault was on January 26, 1700, with an estimated 9.0 magnitude. This earthquake caused the coastline to drop several feet and a tsunami to form and crash into the land. What is most surprising is that evidence for this great earthquake also came from Japan. Japanese historic records indicate that a destructive distantly produced tsunami struck their coast on January 26, 1700. By studying the geological records, the flow of the Pacific Ocean, scientists have linked the tsunami in Japan with the great Pacific Northwest earthquake. Native American legends support the timing of this last event.

<sup>8</sup> Aviation analysis of Earthquake Hazard maps at <http://www.oregongeology.org/hazvu/> liquefaction data is based on soft soils analysis by DOGAMI.

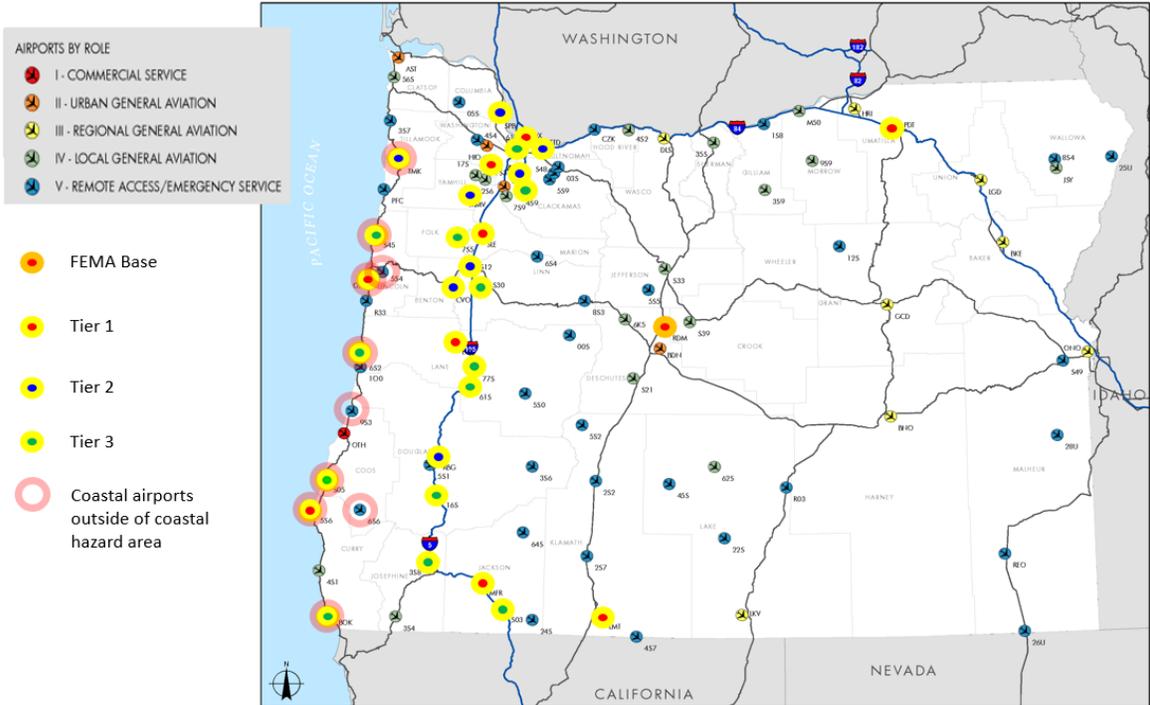
<sup>9</sup> Aviation analysis of Cascadia Event Hazard maps at <http://www.oregongeology.org/hazvu/>

<sup>10</sup> All airports listed have paved runways except Lakeside Municipal and Powers Hayes Field, which have turf runways.

Airport Name <sup>10</sup>	Population within 30-minute Drive of Airport	Population within 20-mile Radius	Population within City Limits
Siletz Bay State Airport	20,385	37,804	2,110
Tillamook Airport	17,630	25,025	4,976
Toledo State Airport	19,578	32,436	3,515

Source: <http://oregon.zoomprospector.com>, accessed by Jviation in 2017

FIGURE 6-2: AIRPORT RESILIENCY WORKGROUP – TIERED SYSTEM AND COASTAL AIRPORTS OUTSIDE THE COASTAL HAZARD AREA



Source: Airport Resiliency Workgroup, Jviation

**6.2.3 Coastal Airports Supporting Cascadia Event Recovery**

Appendix D identifies Oregon airports that are less likely to be inundated by a tsunami due to airport elevation and distance from coast, and that can be utilized to support communities on the coast in the event of a major earthquake and or tsunami. There are ten airports listed that are located outside of the hazardous zones identified by DOGAMI. Each airport’s attributes are identified in an individual two-page summary table in Appendix D. Each table includes:

- Airport name and FAA three-letter identification code
- Airport contact person and telephone number
- Airport Communication Radio Frequency
- Airport elevation in feet and location in miles to coast
- Cascadia Event Hazard: Violent, Severe, Very Strong, Strong, Moderate, Light
- Liquefaction Hazard: High, Moderate, Low, N/A
- Airport inside DOGAMI Hazard Area

- Airport in 100-Year Floodplain
- Oregon Resiliency Plan Tier<sup>11</sup>
- Airport Location Map related to Tsunami Regions (Green equals outside Known Hazard Area)
- Airport Infrastructure: Runway length and width, NAVAIDS, Weather Reporting
- Airport services: FBO Name, Fuel, and whether air ambulance aircraft are based on airport
- Airport Location: Distance to Central Business District and Local Hospital as well as distance to nearest airport on coast
- Airports nearby with instrument approaches and distance
- Community profile: Population within 30-minutes of airport, population within 20-mile radius (by air) and population within associated city
- Population Age distribution profile graph
- 30-minute drive time map

### 6.3 Airports Supporting Emergency Services

Through the collection of data during the inventory process of this study, Oregon airports were asked if they supported emergency services. **Table 6-5** depicts the airports that support emergency services and the types of services. Airports that did not self-report supporting emergency services are not included, nor are airports which research found no emergency service activity.

TABLE 6-5: AIRPORTS SUPPORTING EMERGENCY SERVICES

FAA ID	Associated City	Airport Name	Coast Guard	Air Ambulance	Based Firefighting	Support Firefighting
AST	Astoria	Port of Astoria Regional Airport	X	X		
UAO	Aurora	Aurora State Airport		X		
BDN	Bend	Bend Municipal Airport		X		
BOK	Brookings	Brookings Airport		X		
BNO	Burns	Burns Municipal Airport			X	X
CZK	Cascade Locks	Cascade Locks Airport				X
2S7	Chiloquin	Chiloquin State Airport				X
61S	Cottage Grove	Cottage Grove State Airport -Jim Wright Field		X		
EUG	Eugene	Eugene Airport -Mahlon Sweet Field				X
3S8	Grants Pass	Grants Pass Airport				X
GCD	John Day	Grant County Regional Airport			X	X
JSY	Joseph	Joseph State Airport				X
LMT	Klamath Falls	Crater Lake-Klamath Regional Airport		X	X	X
LGD	La Grande	La Grande / Union County Airport		X	X	X
LKV	Lakeview	Lake County Airport			X	X

<sup>11</sup> The Oregon Resilience Plan identifies airports within each State OAP v6.0 Category that have the potential to maintain or quickly restore operational functions after a major earthquake. The Transportation Task Group arranged 30 airports into a tier system to indicate the priorities for making future investments. Seven of the ten airports identified in this analysis are included in the Tier System. Tier 1 are the essential airports that will allow access to major population centers and areas considered vital for both rescue operations and economic restoration. Tier 2 is a larger network of airports that provide access to most rural areas and will be needed to restore major commercial operations. Tier 3 airports will provide economic and commercial restoration to the entire region after a Cascadia subduction zone event.

FAA ID	Associated City	Airport Name	Coast Guard	Air Ambulance	Based Firefighting	Support Firefighting
S33	Madras	Madras Municipal Airport				X
00S	McKenzie Bridge	McKenzie Bridge State Airport				X
MFR	Medford	Rogue Valley International -Medford Airport		X	X	X
16S	Myrtle Creek	Myrtle Creek Municipal Airport				X
ONP	Newport	Newport Municipal Airport	X			
OTH	North Bend	Southwest Oregon Regional Airport	X	X		
5S0	Oakridge	Oakridge State				X
ONO	Ontario	Ontario Municipal Airport		X	X	X
PDT	Pendleton	Eastern Oregon Regional Airport at Pendleton		X	X	X
HIO	Portland	Portland -Hillsboro Airport		X		
TTD	Portland	Portland -Troutdale Airport		X		
S39	Prineville	Prineville Airport			X	X
64S	Prospect	Prospect State				X
RDM	Redmond	Redmond Municipal Airport -Roberts Field		X	X	X
5S1	Roseburg	George Felt				X
8S3	Santiam Junction	Santiam Junction State				X
SLE	Salem	Salem McNary Field				X
S21	Sunriver	Sunriver				X
TMK	Tillamook	Tillamook Airport		X		
3S6	Clearwater	Toketee State				X
S49	Vale	Miller Memorial Airpark			X	X

Source: ODA Inventory, Oregon Department of Forestry-Fire Protection Division, ADAM Air Ambulance Atlas, Aviation analysis

**Coast Guard:** Of the 36 airports identified as supporting emergency services throughout Oregon, only three support US Coast Guard (USCG) aviation infrastructure. Two of the three are USCG Air Stations: Port of Astoria Regional and Southwest Oregon Regional. At Newport Municipal, the USCG operates an Air Facility<sup>12</sup>. These USCG stations and facilities support search and rescue and emergency medivac efforts throughout the state and neighboring regions.

**Air Ambulance:** The 15 airports that support emergency services do so through a local air ambulance service provider; these airports and service providers include:

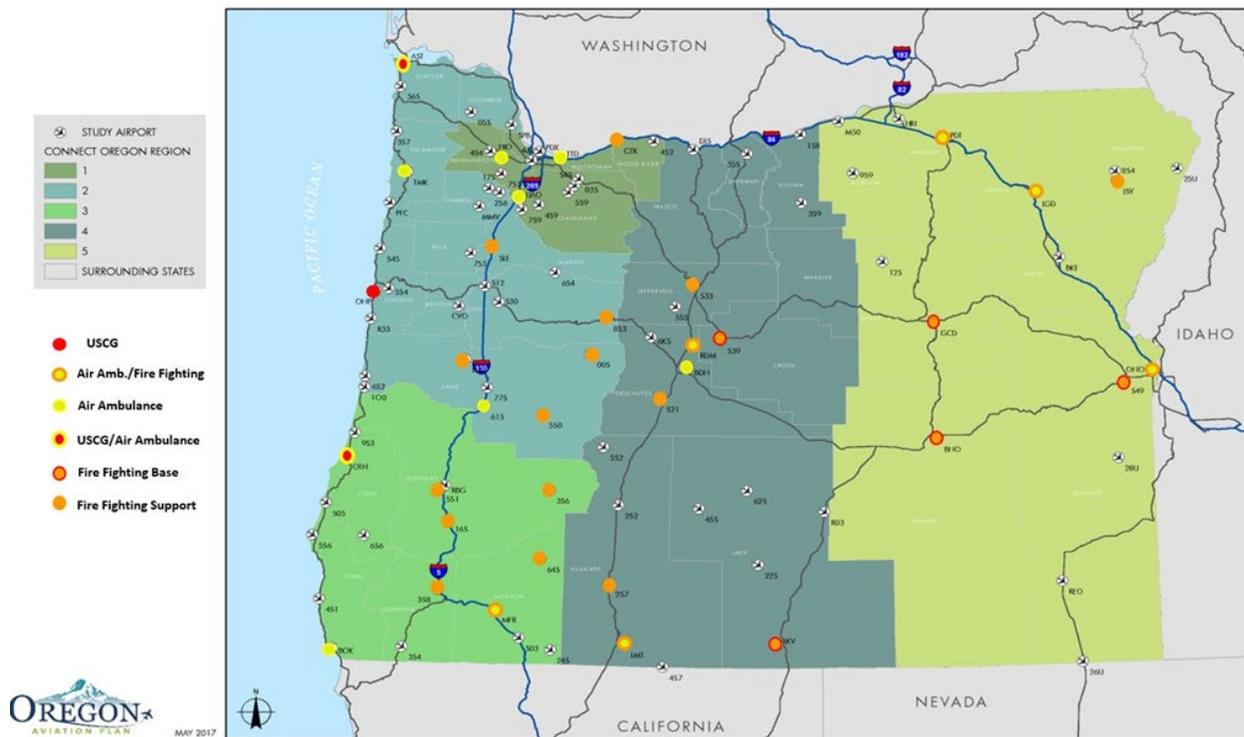
- Port of Astoria Regional Airport - Life Flight Network
- Aurora State Airport - Life Flight Network
- Bend Municipal Airport - AirLink Critical Care Transport
- Brookings Airport - REACH Air Medical Services
- Corvallis Municipal Airport - REACH Air Medical Services
- Cottage Grove State Airport-Jim Wright Field - Life Flight Network
- Eastern Oregon Regional Airport at Pendleton - Life Flight Network

<sup>12</sup> USCG Air Facilities are staffed by crews that rotate in temporarily from a Coast Guard Air Station.

- Crater Lake-Klamath Regional Airport - AirLink Critical Care Transport and REACH Air Medical Services
- La Grande / Union County Airport - Life Flight Network
- Ontario Municipal Airport - Life Flight Network
- Portland - Hillsboro Airport - Premier Jets/Lifeguard Air Ambulance
- Redmond Municipal Airport - Roberts Field - Life Flight Network
- Rogue Valley International - Medford Airport - Mercy Flights, Inc. (Oregon)
- Southwest Oregon Regional Airport - REACH Air Medical Services
- Tillamook Airport - Classic Air Medical

**Wildland Firefighting:** Table 6-5 shows airports that support wildland firefighting services in two ways: either through a full-time based firefighting operation or through operations that are temporarily based at an airport on an as-needed basis. Figure 6-3 shows the airports in Oregon that support wildland firefighting and other emergency services.

FIGURE 6-3: AIRPORTS SUPPORTING EMERGENCY SERVICES



Source: Jviation

Airports that support full-time firefighting operations with based aircraft and infrastructure include:

- Burns Municipal Airport - SEAT<sup>13</sup> Base
- Eastern Oregon Regional Airport at Pendleton - SEAT Base
- Grant County Regional Airport - SEAT Base
- Crater Lake-Klamath Regional Airport - Heavy Base

<sup>13</sup> Single-Engine Attack Aircraft

- La Grande / Union County Airport - Heavy Base
- Lake County Airport - SEAT Base
- Miller Memorial Airpark - SEAT Base
- Ontario Municipal Airport - SEAT Base
- Portland -Troutdale Airport - Heavy Base
- Prineville Airport - SEAT Base
- Redmond Municipal Airport - Roberts Field - Redmond Air Center is the hub of aerial firefighting and training activities in the PNW. Includes smokejumper unit, regional aviation group, a regional fire case, an air tanker base, and an interagency Type I training crew (the Redmond Hotshots)
- Rogue Valley International - Medford Airport - Heavy Base

The following airports have supported firefighting operations in recent years on a temporary or short-term basis:

- Eugene Airport - Mahlon Sweet Field
- George Felt
- Grants Pass Airport
- Madras Municipal Airport
- Myrtle Creek Municipal Airport
- Salem McNary Field
- Sisters Eagle
- Joseph State Airport
- Oakridge State Airport
- Crescent Lake State Airport
- Cascade Locks State Airport
- McDermitt State Airport

**6.4 Airports at Risk to Natural Hazards**

A second aspect of this study was to inventory airports at risk to flooding.

**6.4.1 Flooding**

Study airports were evaluated and to determine which airports are located within a Flood Zone A, which has a 1 percent annual chance of flooding according to FEMA. It was found that ten airports are located within a Flood Zone A and nine airports are partially located within a Flood Zone A. These airports, shown in **Table 6-6**, are considered “at risk” due to flooding hazards.

TABLE 6-6: AIRPORTS WITHIN FLOOD ZONE A

Airport	Within 1% Annual Chance Flood Area
Ashland Municipal Airport -Sumner Parker Field	Partially
Port of Astoria Regional Airport	Completely
Burns Municipal Airport	Completely
Cottage Grove State Airport -Jim Wright Field	Completely

Airport	Within 1% Annual Chance Flood Area
George Felt	Partially
Lake County Airport	Completely
Myrtle Creek Municipal Airport	Completely
Pacific City State Airport	Completely
Portland -Troutdale Airport	Partially
Prospect State Airport	Partially
Rogue Valley International -Medford Airport	Partially
Salem McNary Field	Completely
Seaside Municipal Airport	Completely
Siletz Bay State Airport	Completely
Southwest Oregon Regional Airport	Partially
Stark's Twin Oaks	Partially
Sunriver Airport	Partially
Tillamook Airport	Partially
Toledo State Airport	Completely

Source: <https://msc.fema.gov/portal/search>, Accessed 2017, Aviation analysis

## 6.5 Air Cargo

There are 14 airports in Oregon that support regularly scheduled air cargo service. While passenger airlines do carry some cargo and mail in the belly of the aircraft, the clear majority of air cargo volume arrives and departs on dedicated air cargo aircraft. Portland International Airport is the only Oregon airport with dedicated cargo jet activities, which are operated by FedEx Express, DHL, Amazon Prime Air, and UPS. Thirteen other airports in the state support turboprop and piston engine cargo aircraft, many of which are contracted to “feed” air cargo to and from the cargo jets. This section identifies the airports and air cargo carriers operating within the state.

### 6.5.1 Air Cargo Industry Overview

The movement of air cargo takes place via one of three types of carriers: all-cargo, integrated express, or on passenger airlines as belly compartment cargo. Integrated express operators rely on a hub-and-spoke system and are contracted to move the customer’s goods door-to-door, providing shipment, collection, transport via air/truck, and delivery. Integrated express operators include FedEx Express, UPS, and DHL (which discontinued its domestic delivery service in 2009 to focus on international traffic). All-cargo carriers operate airport-to-airport freight services for their customers but do not offer passenger service. Air cargo services, or “belly cargo,” provided by passenger airlines vary in scope and size from airline to airline depending on differences in aircraft operating fleet. A regional airline with a fleet of turboprop and regional jets cannot accommodate bulky cargo due to capacity limitations in the baggage compartment. However, widebody passenger aircraft have containerized lower decks and are designed to carry large shipments.

Air cargo typically consists of lightweight, time-sensitive, and/or high-value commodities. Common examples of air freight include perishables (flowers, fish, meat, produce), cell phones, computers and tablets, telecommunications equipment, motor vehicle parts, aircraft and aerospace parts, oil and gas drilling equipment, pharmaceuticals, clothing/apparel/shoes, medical devices and supplies, as well as many other items.

The quantity of air cargo moving between origin and destination points, and the amount of cargo transferring via an airport, is closely related to the market area size and airport infrastructure. Oregon’s busiest cargo airports are located near its largest cities, which produce consistent passenger and air cargo traffic demand. Consequently, these facilities must be able to support large commercial aircraft capable of accommodating market demand. Smaller markets in the state produce demand for air cargo service but not at levels sufficient to warrant cargo jet aircraft. These markets are typically served by contracted piston and turboprop aircraft which transport cargo to and from cargo jet aircraft located at PDX or other out of state airports. These smaller airports are typically commercial service airports although general aviation airports were also found to be utilized by contracted cargo feeder airlines.

### 6.5.2 Oregon’s Air Cargo Carrier Networks

Integrated express operators are the dominant air cargo carriers in Oregon as they provide their customers with a national and, in most cases, worldwide door-to-door delivery network. As stated previously, the integrated express operators in Oregon with scheduled air cargo jet aircraft are:

- FedEx Express (49.9% PDX market share)
- UPS (36.8% PDX market share)
- DHL (2.5% PDX market share)

Of the passenger airlines that provide air cargo service, Delta Airlines has the largest market share of belly cargo carried at PDX with 2.4 percent, followed by Southwest Airlines with 1.1 percent, and Alaska Airlines with 1.0 percent market share.

All three integrated express carriers use PDX as a center of cargo jet operations. UPS and FedEx Express contract with feeder airlines that also operate out of PDX to locations throughout the state and region. Northeastern Oregon is the exception to this practice as FedEx Express operates feeder aircraft from Spokane International (GEG) to Pendleton (PDT) and La Grande (LGD).

FedEx Express jets bring cargo from their national sorting hub in Memphis (MEM), as well as hubs in Indianapolis (IND), Fort Worth (AFW), and Oakland (OAK). UPS operates cargo jets to their World Hub in Louisville (SDF), in addition to Ontario (ONT), and Spokane (GEG). PDX is the only airport in Oregon with scheduled cargo jet service. DHL carries only international cargo between the United States and overseas markets. Their Cincinnati (CVG) hub provides Boeing 767 service to PDX. DHL also shares this aircraft route with Seattle making it a one-stop cargo flight (CVG-SEA-PDX). Amazon Prime Air is a new entrant into express package delivery with cargo jets. This new carrier operates Boeing 767 cargo jets from PDX to Lehigh Valley Airport (ABE) in Allentown, Pennsylvania, which is located approximately two-hours truck drive time from the New York City metro area.

Cathay Pacific operates the only international freighter service at PDX, offering twice weekly service from Hong Kong to PDX by way of Los Angeles (LAX). The Cathay Pacific freighter continues to Hong Kong with a refueling stop in Anchorage (ANC).

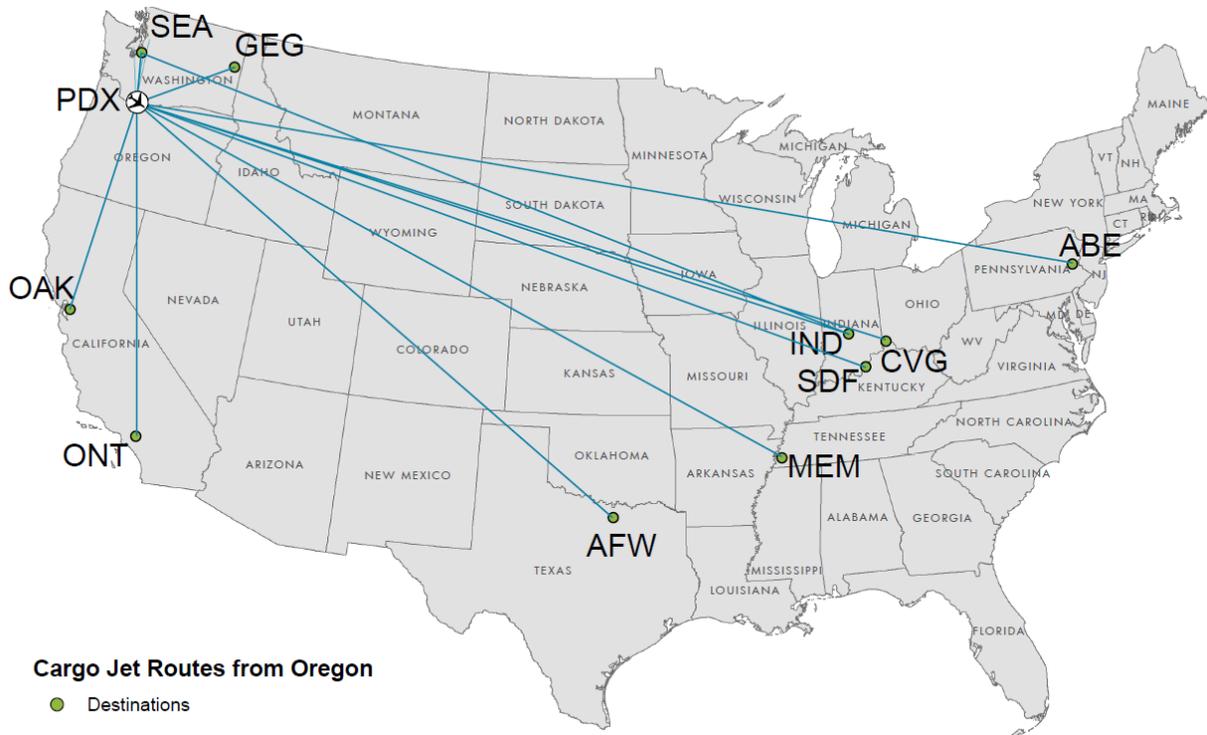
Air cargo jet routes are identified in **Table 6-7** and **Figure 6-4**, which reflects the carriers’ network of operations during the busy weekday period. Weekend networks vary considerably as there is typically less air cargo demand and more reliance on trucks due to the two-day transport window.

TABLE 6-7: AIR CARGO CARRIER PRIMARY JET OPERATIONS AT PDX

Carrier	Destination FAA ID	Aircraft
FedEx Express	MEM	MD11, DC10
	OAK	MD11, DC10
	IND	MD11, DC10
	AFW	B757
UPS	SDF	A306, B763, B752, B747
	ONT	A306, B752
	GEG	A306, B752
DHL	SEA-CVG	B763
Amazon Prime Air	ABE	B763
International Freighter Routes	ANC-HKG	B747-8

Source: 2017 FAA records, Jviation analysis

FIGURE 6-4: OREGON AIR CARGO CARRIER JET OPERATIONS



Source: 2017 FAA flight records, Jviation analysis

Other factors impacting Oregon’s air cargo network include the limited volume of air cargo in smaller communities as well as proximity to PDX. Many of the feeder cargo aircraft in Oregon operate what is known as “long-thin” routes in air cargo industry vernacular. Long-thin routes cover long distances with a low volume of cargo and are usually operated using aircraft with low operating costs, albeit at slower speeds. Many of the intrastate cargo routes to and from PDX, for example, are operated using single-engine aircraft such as the

Cessna 208 Caravan. These aircraft offer relatively fast transport and have adequate cargo capacity for the markets they serve.

Other factors impacting feeder flights in Oregon include the state’s time zone. Due to the location of integrator hubs in the Midwest, West Coast airports have early departure times for eastbound cargo aircraft destined for the Midwest hubs. As a result, FedEx cargo jets bound for Memphis must depart PDX around 6:45PM Pacific Standard Time (PST). Whereas Memphis-bound cargo jets bound from New York City depart as late as 10:45PM Eastern Standard Time (EST). The 6:45 PM PST departure time is considerably early compared to the New York departure time and is a disadvantage for businesses needing to ship packages to the east coast since the cut-off time is early in the afternoon. However, West Coast markets are at an advantage for arriving packages as cargo jets departing Memphis arrive as early as 5:30AM PST. The nuances of time zone differences and long-thin feeder routes have an impact on the routes and schedules of small markets served throughout Oregon.

There are 13 airports in Oregon with contracted air cargo feeder aircraft activity. These contractors utilize turboprop or piston engine aircraft. Ameriflight is commonly contracted with UPS and operates five types of air cargo feeder aircraft in Oregon, which are listed by type and capacity in **Table 6-8**. Empire Airlines is the predominant contract carrier for FedEx Express in Oregon. The Hayden, Idaho based carrier operates two aircraft types in Oregon. Other carriers operate in Oregon on an as-needed basis to supplement FedEx and UPS demand during peak periods or when aircraft have mechanical issues. These carriers include Martin Air and Seattle based AIRPAC Airlines. Martin Air operates Cessna 208s while AIRPAC’s fleet is comprised of Piper Navajo PA-31s and Cessna 208s. Historic FAA flight data for 2017 was utilized in this analysis. All routes analyzed for the 13 airports indicate that flights originate in the remote markets and are bound for PDX, where they remain overnight. The aircraft then return early the following morning to their assigned airport. Air cargo originating in the market area of two airports in eastern Oregon is routed to Spokane International Airport on a single carrier.

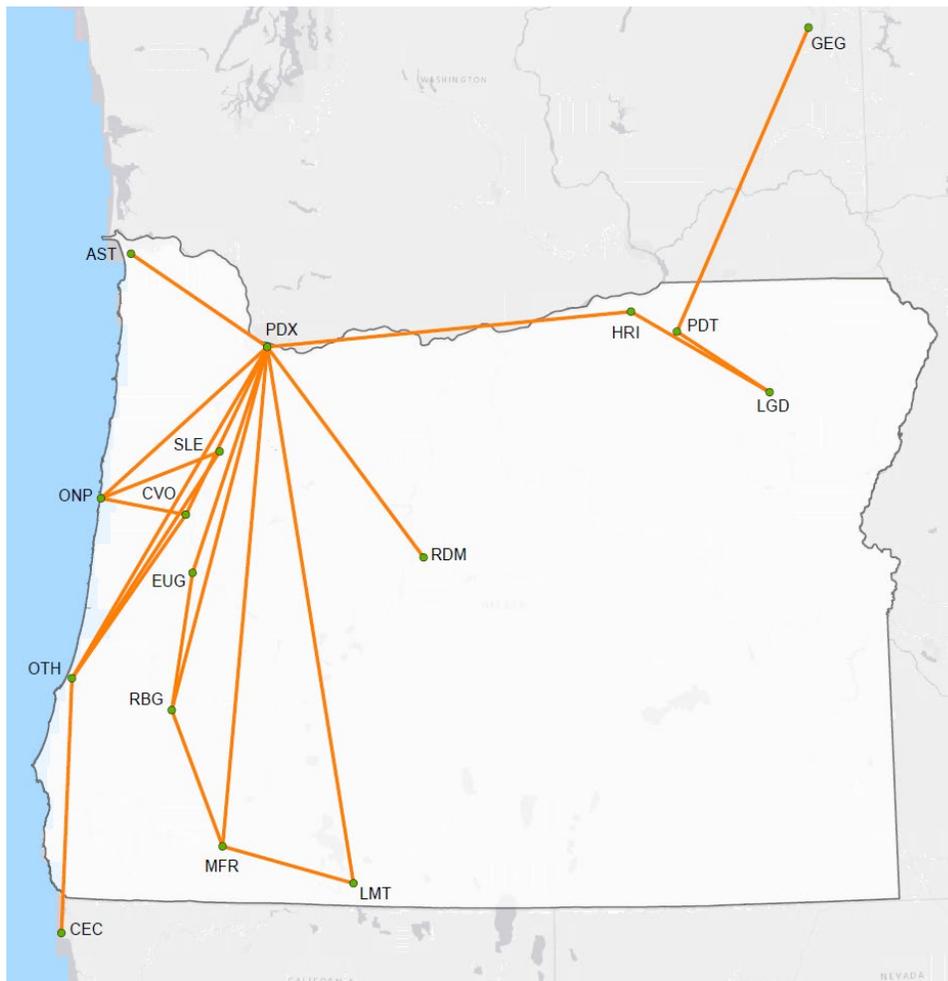
TABLE 6-8: AIR CARGO CARRIER FEEDER TO PRIMARY JET OPERATIONS

Aircraft	Maximum Payload	Cargo Capacity	Cruise Speed
<b>Ameriflight Aircraft</b>			
– Piper PA-31-350 Chieftain	1,750 pounds	245 cubic feet	205 mph
– Beechcraft 1900	5,800 pounds	819 cubic feet	275 mph
– Embraer EMB-120 Brasilia	8,000 pounds	1162 cubic feet	320 mph
– Fairchild SA-227 Metroliner SW4	4,400 - 4,900 pounds	628 cubic feet	310 mph
– Beechcraft 99	3,400 - 3,500 pounds	450 cubic feet	240 mph
<b>Empire Aircraft</b>			
– Cessna Caravan 208B	3,305 pounds	341 cubic feet	214 mph
– ATR 42	14,579 pounds	1,660 cubic feet	337 mph

Source: Carrier web sites

**Figure 6-5** identifies all scheduled feeder routes operating on weekdays in Oregon while **Figure 6-6** shows the drive-time service areas for all Oregon airports with air cargo Service. A 120-minute drive time was used for PDX since this market has the best air cargo service in the state in terms of cargo aircraft schedules. The remaining markets have 30-minute drive time presented. In total, approximately 3.35 million residents, or 83 percent of the state’s population, are provided sufficient air cargo delivery and pickup times.

FIGURE 6-5: AIR CARGO FEEDER ROUTES IN OREGON



Source: 2017 FAA flight records, Jviation analysis

Oregon’s network of highways and roadways are used by integrated express carriers and other cargo carriers to transport air cargo to and from aircraft and trucks. These roadways are essential in the delivering air cargo (freight, parcels and mail) to customers throughout the state. In 1995, the US Congress passed into law the National Highway System Designation Act of 1995. The inventory of the NHS was completed in 1998 and approved by Congress as part of the Transportation Equity Act for the 21st Century. Intermodal connectors are one of four subsystems that comprise the NHS. The other three subsystems are: 1) Interstates, 2) Other Principal Arterials, and 3) the Strategic Highway Network. Intermodal connectors can be either freight or passenger roadways. Freight intermodal connectors are roads that provide the “last-mile” connection between major rail, port, airport, and intermodal freight facilities on the NHS. The officially designated network of NHS freight intermodal connectors accounts for less than one percent of the total NHS mileage, but these roads are critical for the timely and reliable movement of freight.

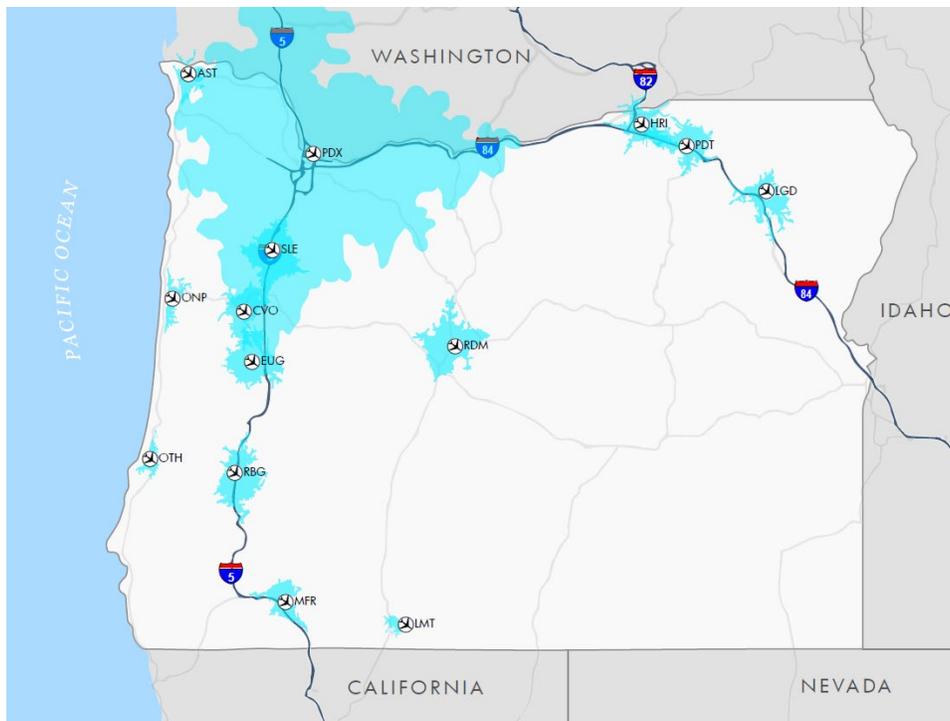
In 2017, Oregon Department of Transportation developed a study on intermodal connectors in the state entitled the Oregon Freight Intermodal Connector (OFICS) Study which was part of the implementation of the 2011 Oregon Freight Plan. The 2011 Oregon Freight Plan (OFP) incorporated strategic implementation initiatives 3.1 and 3.2, that direct the state to “identify additional freight intermodal connectors...and monitor

the mobility, infrastructure conditions and performance of the NHS intermodal connectors and other last-mile connections to important freight generation sites”.

The Oregon Freight Intermodal Connector System (OFICS) study identified intermodal terminals, additional intermodal connectors, validated the existing NHS intermodal connectors, identified connector needs and developed a tiered list and map of connectors.

The next section provides an overview of air cargo carrier activity at 13 airports in Oregon. All but three of these airports are Part 139 facilities and it is noteworthy to point out that contract regional cargo carriers prefer to operate at Part 139 airports. This section also identifies roadways and highways functioning as a last-mile connection between the airport and roadway networks. The OFICS Intermodal Connectors web application provides more detail on the last-mile networks and is available at the ODOT ArcGIS Online gallery: <https://geo.maps.arcgis.com/apps/webappviewer/index.html?id=0b35d56e2cfa4ffd8c308c09722f1da5> .

FIGURE 6-6: OREGON MARKETS WITH SUFFICIENT AIR CARGO SERVICE



Source: 2017 FAA flight records, Jviation analysis

### 6.5.3 Air Cargo Carrier Activity at Oregon Airports

Integrated express air cargo service providers (FedEx, UPS) operate five days per week in 14 Oregon markets, including Portland. Some markets receive both FedEx and UPS aircraft service while others are served by just one carrier. Although air cargo tonnage statistics are not readily available for all 14 airports, daily lift capacity, which is used as a metric to identify air cargo traffic, can be estimated for all carriers operating at an airport since air cargo aircraft schedules are known<sup>14</sup>. Except for Portland, all Oregon markets rely on contracted air cargo feeder aircraft for express shipments. The estimated daily lift capacity for these feeder carriers is presented in **Table 6-9**. Air cargo lift capacity ranges from 1,487 pounds per day at Pendleton to over 16,200

<sup>14</sup> If a flight serves two markets, such as the PDX-HRI-LGD route, it is assumed HRI and LGD each have 50% of the route air cargo capacity.

pounds for Medford. Statewide, total daily air cargo lift capacity for feeder carriers is approximately 72,150 pounds and serves approximately 1.3 million residents outside of Portland. For example, Port of Astoria Regional Airport is served by UPS with a Beech 99 cargo feeder aircraft to and from PDX. This particular feeder aircraft has a cargo capacity of approximately 3,450 pounds; however, assuming a 90-percent load factor, the useful capacity is realistically closer to 3,100 pounds per day.

Analyzing the ratio of resident population per pound of lift capacity provides insight into how well a market is served. In the case of Astoria, one pound of daily lift is available for every nine persons in the market. For Newport Oregon, one pound of lift is available for every five persons. In general, many of the remote communities in Oregon such as Klamath Falls, North Bend, Medford, Roseburg, La Grande have above-average air cargo service in terms of their lift capacity to population ratio. It is important to note that the air cargo needs of several markets such as Salem, Corvallis, and Eugene are served by a combination of aircraft and trucks to and from Portland: they are not solely reliant on aircraft for air cargo service.

TABLE 6-9: ESTIMATED AVERAGE DAILY LIFT PER AIRPORT WITH SCHEDULED CARGO SERVICE

FAA ID	Airport Name	Population within 30-Minute Drive of Airport	Estimated Daily Lift Capacity in Pounds	2018 Annual Cargo in Pounds*	Number of Persons Served/Pound of Lift
AST	Port of Astoria Regional	28,648	3,105	NA	9
PDT	Eastern Oregon Regional Airport at Pendleton	27,473	1,487	1,405,000	18
CVO	Corvallis Municipal	98,199	4,592	838,000	21
EUG	Eugene Airport - Mahlon Sweet Field	290,954	7,567	1,659,000	38
HRI	Hermiston Municipal	34,031	2,093	NA	16
LMT	Crater Lake-Klamath Regional	23,236	4,527	1,922,000	5
LGD	La Grande/Union County	22,248	2,093	629,000	11
ONP	Newport Municipal Airport	24,189	4,592	1,050,000	5
RDM	Roberts Field (Redmond Municipal Airport)	142,623	6,080	3,052,000	23
MFR	Rogue Valley International-Medford	178,047	16,226	7,429,000	11
RBG	Roseburg Regional	83,389	7,567	841,000	11
SLE	Salem-McNary Field	349,357	6,080	1,136,000	57
OTH	Southwest Oregon Regional Airport	38,154	6,145	1,434,000	6
Total		1,340,548	72,152	21,395,000	19

Source: 2017 FAA flight records, Aviation analysis, \*US Bureau of Transportation Statistics – 2018 Airport Snapshots (inbound/outbound)

The remaining portion of this section provides detail for each cargo market served by air cargo feeder service in Oregon.

### Salem-McNary Field - Salem, Oregon (SLE)

The Salem, Oregon market is unique in that it is near PDX yet has air cargo service from SLE to PDX. Both FedEx Express and UPS truck cargo from PDX to Salem in the morning after the aircraft arrive from their Midwest sortation hubs. However, early cut-off times in the late afternoon warrant the use of aircraft operations from SLE to PDX by both carriers. Prior to arriving in SLE, UPS aircraft operated by Ameriflight depart from Newport (ONP), while FedEx aircraft operated by Empire Airlines depart from North Bend (OTH). Highway traffic congestion between Salem and Portland may also be a factor in these carriers scheduling a stop in Salem. Each

airport with scheduled air cargo activity was analyzed utilizing a geographic information system to determine population within a 30-minute drive of the airport. Analysis indicates that Salem has the largest population within a 30-minute drive time, nearly 349,400 residents, of all the 13 Oregon airports supporting scheduled air cargo feeder aircraft operations. Interstate 5 is approximately 2.1 miles from the airport, and its intermodal connectors are 25th Street and Mission Street.

TABLE 6-10: SALEM-MCNARY FIELD

<b>Airport:</b>	SLE	<b>Part 139:</b>	Yes
<b>Population within 30 Minutes:</b>	349,357		
<b>Air Cargo Carrier Routes</b>	<b>Aircraft</b>	<b>Regional Carrier</b>	<b>Prime Carrier</b>
ONP-SLE-PDX	BE99, PA31	AMERIFLIGHT	UPS
OTH-SLE-PDX	C208	EMPIRE	FedEx

**Corvallis Municipal Airport (CVO)**

Corvallis is in a similar position to Salem in that both FedEx Express and UPS truck cargo from PDX to Corvallis. Early cut-off times in the late afternoon, as well as likely highway congestion, warrant the use of aircraft by both carriers from CVO to PDX. FedEx’s aircraft start in Newport (ONP) utilizing an Empire Airlines C208B. UPS has a two-prong routing approach using two separate Ameriflight aircraft to serve CVO, with a BE99 departing from Southwest Oregon Regional Airport in North Bend (OTH) and a BE99 or PA31 departing from Newport (ONP). Corvallis is roughly 14 miles from Interstate 5, though it is only about 4.2 miles from the Corvallis-Lebanon Highway 210 (Oregon Route 34). This highway provides direct access to Interstate 5.

TABLE 6-11: CORVALLIS MUNICIPAL AIRPORT

<b>Airport:</b>	CVO	<b>Part 139:</b>	No
<b>Population within 30 Minutes:</b>	98,199		
<b>Air Cargo Carrier Routes</b>	<b>Aircraft</b>	<b>Regional Carrier</b>	<b>Prime Carrier</b>
ONP-CVO-PDX	BE99, PA31	AMERIFLIGHT	UPS
OTH-CVO-PDX	BE99	AMERIFLIGHT	UPS
ONP-CVO-PDX	C208	EMPIRE	FedEx

Source: FAA flight records, Aviation analysis

**Newport Municipal Airport (ONP)**

Both FedEx and UPS contract feeder aircraft operations at Newport Municipal. UPS services the market with two Ameriflight aircraft types, a BE99 and a PA31, both of which provide nonstop service each morning from PDX. The late afternoon route to PDX includes stops at SLE and CVO. UPS determines which gauge of aircraft stops at which market based on daily cargo demand estimates. FedEx’s Cessna Caravan, operated by Empire Airlines, also operates nonstop from PDX to ONP, and stops at CVO on its return flight to PDX where cargo is transferred to cargo jets bound for their respective hubs. Newport Municipal Airport is located almost directly on the Oregon Coast Highway (U.S. Route 101), giving it direct access to any city along Oregon’s coast.

TABLE 6-12: NEWPORT MUNICIPAL AIRPORT

<b>Airport:</b>	ONP	<b>Part 139:</b>	Yes
<b>Population within 30 Minutes:</b>	24,189		
<b>Air Cargo Carrier Routes</b>	<b>Aircraft</b>	<b>Regional Carrier</b>	<b>Prime Carrier</b>



ONP-CVO-PDX-ONP	BE99, PA31	AMERIFLIGHT	UPS
ONP-SLE-PDX-ONP	BE99, PA31	AMERIFLIGHT	UPS
ONP-CVO-PDX-ONP	C208	EMPIRE	FedEx

Source: FAA flight records, Aviation analysis

### Southwest Oregon Regional Airport (OTH)

Both FedEx and UPS contract feeder aircraft operations at Southwest Oregon Regional. UPS serves the market with two BE99 aircraft operated by Ameriflight. One provides nonstop service each morning from PDX while the other provides nonstop service to/from Crescent City, California (CEC). This route is the only cargo feeder route serving Oregon originating in California. The UPS BE99 route to PDX stops in Corvallis (CVO), while the FedEx Express contracts with Empire Airlines, whose C208 stops in Salem (SLE) on its return to PDX from OTH. Southwest Oregon Regional Airport is less than a mile away from the Oregon Coast Highway (U.S. Route 101), and is connected by Virginia Ave. The proximity of the airport to this highway gives it access to any city along Oregon’s coast.

TABLE 6-13: SOUTHWEST OREGON REGIONAL AIRPORT

<b>Airport:</b>	OTH	<b>Part 139:</b>	Yes
<b>Population within 30 Minutes:</b>	38,154		
<b>Air Cargo Carrier Routes</b>	<b>Aircraft</b>	<b>Regional Carrier</b>	<b>Prime Carrier</b>
OTH-CVO-PDX-OTH	BE99	AMERIFLIGHT	UPS
CEC-OTH-CEC	BE99	AMERIFLIGHT	UPS
OTH-SLE-PDX-OTH	C208	EMPIRE	FedEx

Source: FAA flight records, Aviation analysis

### Eugene Airport - Mahlon Sweet Field (EUG)

UPS contracts with Ameriflight to operate cargo feeder aircraft at EUG. The carrier primarily utilizes BE99 aircraft in this market but at times uses a Piper Navajo PA31. The route is nonstop to and from PDX. FedEx Express contracts with Empire Airlines to operate two C208s at EUG. One aircraft is based at EUG during the day while the other originates in Roseburg then stops at EUG on its way to PDX. The airport is just under 9 miles away from Interstate 5. It is connected primarily via the Randy Pape Beltline (Oregon Route 569) , which accounts for just over 6 of those miles.

TABLE 6-14: EUGENE AIRPORT-MAHLON SWEET FIELD

<b>Airport:</b>	EUG	<b>Part 139:</b>	Yes
<b>Population within 30 Minutes:</b>	290,954		
<b>Air Cargo Carrier Routes</b>	<b>Aircraft</b>	<b>Regional Carrier</b>	<b>Prime Carrier</b>
EUG-PDX-EUG	BE99, PA31	AMERIFLIGHT	UPS
RBG-EUG-PDX-RBG	C208	EMPIRE	FedEx
EUG-PDX-EUG	C208	EMPIRE	FedEx

Source: FAA flight records, Aviation analysis

**Rogue Valley International-Medford Airport (MFR)**

UPS contracts with Ameriflight to operate cargo feeder aircraft at EUG, which primarily utilizes an EMB120 aircraft. The EMB120 is the fastest and largest cargo aircraft in Ameriflight’s fleet. Ameriflight also uses Piper Navajo PA31 and BE99 aircraft in the market, particularly on routes shared with Roseburg (RBG) and Crater Lake-Klamath Regional (LMT). FedEx contracts with Empire Airlines on its PDX route, which uses an ATR42 aircraft. Similar to the EMB1320, the ATR42 is also the largest and fastest cargo aircraft in Empire’s fleet, ideal for long-thin routes. At 223 miles, the nonstop MFR to PDX route is the second longest cargo feeder route in Oregon. The airport is approximately 1.3 miles from Interstate 5 and is primarily connected by Biddle Road. This road connects to the Crater Lake Highway which provides direct access to Interstate 5.

TABLE 6-15: ROGUE VALLEY INTERNATIONAL-MEDFORD AIRPORT

<b>Airport:</b>	MFR	<b>Part 139:</b>	Yes
<b>Population within 30 Minutes:</b>	178,047		
<b>Air Cargo Carrier Routes</b>	<b>Aircraft</b>	<b>Regional Carrier</b>	<b>Prime Carrier</b>
PDX-MFR-PDX	BE99, PA31, EMB120	AMERIFLIGHT	UPS
PDX-LMT-MFR-PDX	BE99	AMERIFLIGHT	UPS
PDX-MFR-RBG-PDX	BE99	AMERIFLIGHT	UPS
PDX-MFR-PDX	ATR43	EMPIRE	FEDEX

Source: FAA flight records, Aviation analysis

**Crater Lake-Klamath Regional Airport (LMT)**

UPS triangulates the Klamath (LMT) and Medford (MFR) markets, sharing an Ameriflight BE99 cargo feeder route to and from PDX. FedEx Express, however, serves LMT with a single Empire Airlines C208, which operates nonstop to and from PDX. Klamath to PDX is the longest air cargo route in Oregon at 243 miles one way. This airport does not have direct access to a national highway but has access to several state highways. These highways include Oregon Route 97, 66, 39, and 140. Route 130 is directedly north of the airport and connects several of these highways.

TABLE 6-16: CRATER LAKE-KLAMATH REGIONAL AIRPORT

<b>Airport:</b>	LMT	<b>Part 139:</b>	Yes
<b>Population within 30 Minutes:</b>	23,236		
<b>Air Cargo Carrier Routes</b>	<b>Aircraft</b>	<b>Regional Carrier</b>	<b>Prime Carrier</b>
PDX-LMT-MFR-PDX	BE99	AMERIFLIGHT	UPS
PDX-LMT-PDX	C208	EMPIRE	FedEx

Source: FAA flight records, Aviation analysis

**Roseburg Regional Airport (RBG)**

RBG is in Douglas County, Oregon, located about one-mile northwest of Roseburg. Approximately 82,000 people reside within a 30-minute drive of this general aviation airport. The airport is not a Part 139 facility yet is utilized by both FedEx Express and UPS. FedEx contracts with Empire Airlines to operate a route from Roseburg to PDX with a stop in Eugene. The morning route from PDX is nonstop and is indicative of the aircraft carrying more cargo inbound to Roseburg and less cargo outbound. UPS, contracting with Ameriflight, also originates a cargo route in Roseburg and is shared with several markets as demand dictates. This aircraft may be considered a “spare” aircraft as management may require the pilot to make a stop in Eugene, Redmond, or

Medford, depending on the cargo volume for those markets. The airport is adjacent to Interstate 5 and thus has nearly direct access to that interstate. Access to the interstate is less than a mile away in and is provided by Bowers St and Edenbower Blvd to the north, and via Mulholand Road and Garden Valley Blvd to the south.

TABLE 6-17: ROSEBURG REGIONAL AIRPORT

<b>Airport:</b>	RBG	<b>Part 139:</b>	No
<b>Population within 30 Minutes:</b>	83,389		
<b>Air Cargo Carrier Routes</b>	<b>Aircraft</b>	<b>Regional Carrier</b>	<b>Prime Carrier</b>
RBG-EUG-PDX-RBG	C208	EMPIRE	FedEx
PDX-EUG/RDM/MFR-RBG-PDX	BE99	AMERIFLIGHT	UPS

Source: FAA flight records, Aviation analysis

### Roberts Field (Redmond Municipal Airport) (RDM)

Roberts Field has the most straightforward air cargo feeder routes of the 13 airports being analyzed. Both FedEx and UPS contract with their respective feeder carriers to operate nonstops to and from PDX. UPS occasionally supplements cargo lift in this market with a BE99 based in Roseburg. The airport is not close to any federal interstate highway, but it has access to several state and federal highways. These highways include U.S. Route 97, roughly half a mile from the airport, and Oregon Route 126 and U.S. Route 26, which connects Redmond with Route 26, and thus access to the eastern portions of the state.

TABLE 6-18: ROBERTS FIELD (REDMOND MUNICIPAL AIRPORT)

<b>Airport:</b>	RDM	<b>Part 139:</b>	YES
<b>Population within 30 Minutes:</b>	142,623		
<b>Air Cargo Carrier Routes</b>	<b>Aircraft</b>	<b>Regional Carrier</b>	<b>Prime Carrier</b>
PDX-RDM-PDX	C208	EMPIRE	FedEx
PDX-RDM-PDX	BE99	AMERIFLIGHT	UPS

Source: FAA flight records, Aviation analysis

### Hermiston Municipal Airport (HRI)

UPS contracts with Ameriflight which operates a Fairchild Metroliner (SW4) aircraft from PDX to Hermiston (HRI) then on to La Grande (LGD) in eastern Oregon. The HRI to PDX leg is 163 miles. The SW4 route is the only route in Oregon utilizing this aircraft type. HRI is not a Part 139 airport. The Oregon population within a 30-minute drive time of HRI, estimated at 36,800, does not include residents in nearby Washington state. Interstate 84 is located approximately 5.5 miles from the airport. The primary connecting road is U.S. highway 395, which directly intersects with the airport road.

TABLE 6-19: HERMISTON MUNICIPAL AIRPORT

<b>Airport:</b>	HRI	<b>Part 139:</b>	No
<b>Population within 30 Minutes:</b>	34,031		
<b>Air Cargo Carrier Routes</b>	<b>Aircraft</b>	<b>Regional Carrier</b>	<b>Prime Carrier</b>
PDX-HRI-LGD-HRI-PDX	SW4	AMERIFLIGHT	UPS

Source: FAA flight records, Aviation analysis

**La Grande/Union County Airport (LGD)**

La Grande/Union County Airport is unique in that it accommodates two air cargo feeder carriers feeding cargo jets at two airports. FedEx contracts with Empire Airlines to carry cargo north to Spokane International, with a stop in Pendleton, using a C208B. UPS operates an LGD-to-HRI-to-PDX route using Fairchild Metroliner (SW4) aircraft. Given the distance covered on this route, the relatively fast SW4 is ideally suited for long-thin routes in eastern Oregon. La Grande has the smallest population within a 30-minute drive time of the 13 airports analyzed. The airport is roughly 1.5 miles from Interstate – 84. It is connected to the interstate by La Grande Baker Highway (Oregon Route 203).

TABLE 6-20: LA GRANDE/UNION COUNTY AIRPORT

<b>Airport:</b>	LGD	<b>Part 139:</b>	No
<b>Population within 30 Minutes:</b>	22,248		
<b>Air Cargo Carrier Routes</b>	<b>Aircraft</b>	<b>Regional Carrier</b>	<b>Prime Carrier</b>
GEG-PDT-LGD-PDT-GEG	C208	EMPIRE	FedEx
PDX-HRI-LGD-HRI-PDX	SW4	AMERIFLIGHT	UPS

Source: FAA flight records, Aviation analysis

**Eastern Oregon Regional Airport at Pendleton (PDT)**

Only one cargo carrier operates out of PDT: FedEx Express contracts with Empire Airlines to operate a C208B at the airfield. PDT is the only Essential Air Service Airport in Oregon, which is provided by Boutique Air. Ameriflight, a contract carrier for UPS, operated at PDT until 2013 using Fairchild Metroliner SW4 aircraft. Ameriflight discontinued regular Pendleton service and relocated its area operations to Hermiston in 2013. Ameriflight continues to use PDT for unscheduled/ad hoc operations and as a weather alternate to Hermiston. The airport has a direct connection to Interstate – 84 as it can be accessed from the Airport Road directly.

TABLE 6-21: EASTERN OREGON REGIONAL AIRPORT AT PENDLETON

<b>Airport:</b>	PDT	<b>Part 139:</b>	No
<b>Population within 30 Minutes:</b>	27,473		
<b>Air Cargo Carrier Routes</b>	<b>Aircraft</b>	<b>Regional Carrier</b>	<b>Prime Carrier</b>
GEG-PDT-LGD-PDT-GEG	C208	EMPIRE	FedEx

Source: FAA flight records, Aviation analysis

**Port of Astoria Regional Airport (AST)**

Port of Astoria Regional receives approximately three to four cargo flights per week operating between PDX and AST. These are primarily contract flights for UPS utilizing BE99 and PA31 aircraft but some C208 contract flights with AIRPAC are frequently observed. Port of Astoria Regional is not a Part 139 airport. It was also noted that some flights included a stop in Tillamook and that TMK received an increasing number of flights in the month of November, which is likely related to holiday retail traffic. Though it is not close to an interstate highway, the airport is just 2 miles from the Oregon Coast Highway (U.S. Highway 101). This provides easy access to any city along Oregon’s coast.

TABLE 6-22: PORT OF ASTORIA REGIONAL AIRPORT

<b>Airport:</b>	AST	<b>Part 139:</b>	No
<b>Population within 30 Minutes:</b>	28,648		



Air Cargo Carrier Routes	Aircraft	Regional Carrier	Prime Carrier
AST-PDX-AST	BE99	AMERIFLIGHT	UPS

Source: FAA flight records, Aviation analysis

#### 6.5.4 Trucking Air Cargo Instead of Flying Air Cargo

Several airport markets in Oregon do not have scheduled air cargo service provided by integrated express carriers. Instead, these markets are served by trucks that transport cargo between the market area and an aircraft at a nearby airport. For example, FedEx Express trucks cargo from Astoria to PDX and from Ontario, Oregon to Boise, Idaho where the cargo is then loaded onto waiting aircraft. Integrated express carriers may truck cargo 120 minutes or more. For example, UPS may truck the majority of air cargo from Astoria to PDX to load onto an aircraft bound for Louisville (SDF), but then supplement its market lift with the highest priority cargo on a contracted BE99 to and from PDX. It is also important to point out that FedEx Express supplements air cargo lift requirements in Oregon’s larger markets with trucks since trucking is five to ten times less expensive than flying air cargo. For example, it is highly likely that FedEx trucks a 53-foot-long trailer loaded with five containers of deferred (second- and third-day delivery) packages between Portland and Oakland, California, one of the carrier’s primary hubs.

#### 6.5.5 Air Cargo Summary

Oregon’s airport system supports an extensive network of integrated express air cargo routes which carry the majority of air cargo to air cargo jets at PDX. These carriers rely on airports to provide navigational and weather reporting equipment as well as adequate runway length and aircraft services. While there is no major cargo sortation hub in the state for air cargo carriers, PDX supports a number of regional cargo feeder routes providing market access to smaller communities in Oregon. Trucks are used to transport air cargo within Oregon, while second- and third-day delivery packages are likely trucked out of the state. All overnight packages depart and arrive on integrated express cargo jets. Passenger airlines carry a small share of Oregon’s air freight and mail as belly cargo.

### 6.6 State-owned Airports

#### 6.6.1 State-owned Airports

Oregon’s airport system consists of 97 aviation facilities including 95 airports, one heliport, and one seaplane base. Nearly 30 percent of the airports in the state are owned by the Oregon Department of Aviation (ODA). These 28 airports range from Aurora State Airport, one of the busiest airports in Oregon with extensive corporate jet activity, to small rural airports and airports along the Oregon Coast. Analysis of other states on the West Coast and states adjacent to Oregon reflects a wide range of state-owned airport patterns. Idaho has 32 airports that are owned and operated by the State, most of which are rural backcountry airports operated by ITD, and several are owned by other state agencies. Washington DOT owns and operates 16 airports while California only has two state-owned airports. The State of Nevada owns no airports. Alaska owns and operates 237 general aviation and commercial service airports.

**Table 6-23** identifies airports owned by ODA and their respective OAP v6.0 airport categories, and provides information on NPIAS airport status, number of based aircraft, whether the airport is a State Warning Airport, and whether it’s identified in the state’s Cascadia Event Resiliency Plan. Runway length and flood zone information are also provided.





Bandon State Airport is in Coos County along the Oregon Coast. This state-owned airport is a Category III airport and has 25 based aircraft. The airport is eligible for federally funded facility improvements since it is in the NPIAS. Over 7,500 residents are within a 30-minute drive of the airport.

Aurora State Airport is a Category II - Urban General Aviation Airport. The airport is located in the Portland MSA and has over 1 million residents within a 30-minute drive of the airport. The airport is one of the busiest in the state with 346 based aircraft. The airport’s runway is just over 5,000 feet long and a runway extension is being studied for this facility.

**Table 6-23** depicts state-owned airports listed in the State Resiliency Plan. Most of these airports are Category IV airports and are designated to support community recovery and state economic recovery after a Cascadia event.

TABLE 6-23: STATE-OWNED OREGON AIRPORTS

Airport	ID	City	NPIAS	Based Aircraft	Warning Airport	Resiliency Plan	Runway Length	30-minute Drive Time Oregon Population	Within 1% Annual Chance Flood Area
<b>Category II</b>									
Aurora State Airport	UAO	Aurora	Yes	346	No		5,004	1,052,366	
<b>Category III</b>									
Bandon State Airport	S05	Bandon	Yes	25	No	Tier 3	3,601	7,564	
<b>Category IV</b>									
Condon State Airport - Pauling Field	3S9	Condon	Yes	11	No		3,500	1,057	
Cottage Grove State Airport - Jim Wright	61S	Cottage Grove	Yes	134	No	Tier 3	3,188	198,180	Completely
Independence State Airport	7S5	Independence	Yes	191	No	Tier 3	3,142	269,469	
Joseph State Airport	JSY	Joseph	Yes	14	No		5,200	4,029	
Lebanon State Airport	S30	Lebanon	Yes	49	No	Tier 3	2,877	140,520	
Mulino State Airport	4S9	Mulino	Yes	63	No	Tier 3	3,425	198,580	
Siletz Bay State Airport	S45	Gleneden Beach	Yes	13	No	Tier 3	3,297	20,728	Completely
Wasco State Airport	3S5	Wasco	Yes	4	No		3,450	1,618	
<b>Category V</b>									
Alkali Lake State	R03	Alkali Lake	No	0	No		6,100	3	
Cape Blanco State Airport	5S6	Sixes	No	7	No	Tier 1	5,100	2,547	
Cascade Locks State Airport	CZK	Cascade Locks	No	0	Yes		1,800	11,917	
Chiloquin State Airport	2S7	Chiloquin	Yes	6	No		3,749	4,820	
Crescent Lake State Airport	5S2	Crescent Lake	No	0	Yes		3,900	1,096	
McDermitt State Airport	26U	McDermitt	Yes	1	No		5,900	64	
McKenzie Bridge State	00S	McKenzie Bridge	No	0	Yes		2,600	933	
Nehalem Bay State Airport	3S7	Manzanita	No	0	No		2,350	6,769	
Oakridge State	5S0	Oakridge	No	5	No		3,610	5,940	
Owyhee Reservoir State	28U	Owyhee Reservoir	No	0	Yes		1,840	-	
Pacific City State Airport	PFC	Pacific City	No	5	Yes		1,875	10,239	Completely
Pinehurst State Airport	24S	Pinehurst	No	7	Yes		2,800	235	
Prospect State Airport	64S	Prospect	No	1	Yes		4,000	1,396	Partially
Rome State	REO	Rome	No	0	No		6,000	12	
Santiam Junction State	8S3	Santiam Junction	No	0	Yes		2,800	999	
Toketee State	3S6	Clearwater	No	0	No		5,350	61	
Toledo State Airport	5S4	Toledo	No	9	Yes		1,750	17,510	Completely
Wakonda Beach State	R33	Waldport	No	3	Yes		2,000	9,616	

Source: Aviation, Century West, US Census, OGAMI

### 6.6.2 State Warning Airports

Nine of the airports owned and operated by ODA have been designated as Warning Airports, which are all Category V – RAES Airports. These Warning Airports do not meet normal dimensional standards and have

conditions that require specific pilot knowledge. Aircraft operations at these airports require special techniques and procedures to use safely and may not be usable by many aircraft or pilots under normal conditions. **Table 6-24** identifies the Warning Airports and the key attributes. Specific information on each airport can be found at the ODA website: <https://www.oregon.gov/aviation/pages/warning.aspx>.

**Runway Dimensions:** Many Warning Airports have narrow runways, and most have unpaved surfaces. Six of the ten airports are 30 feet wide, which adds limited margin of error for pilots. Toledo State Airport has the shortest runway at just 1,750 feet, while Prospect State Airport has the longest at 4,000 feet by 50 feet wide.

**Based Aircraft:** While many of the airports are challenging to operate within, several have attracted aircraft owners to base their aircraft. Fifty percent of the airports in this special category have based aircraft. Toledo State has nine based aircraft while Pinehurst has seven.

**Nearby Population:** Owyhee Reservoir State Airport is remotely located in eastern Oregon and has no nearby population within its 30-minute drive time; it is one of the most remote airports in the Oregon system. The airport provides access to camping, hunting, and fishing in the area and is considered a backcountry airport by ODA. Santiam Junction State Airport is listed as a backcountry airport by BackCountryPilot.org<sup>15</sup>. Toledo State Airport serves the greatest population of the 10 airports on the Warning Airports list, with an associated city population of over 3,500 and a population of over 17,500 within 30 minutes of the airport.

TABLE 6-24: STATE WARNING AIRPORTS

FAA Code	Associated City	Airport Name	Based Aircraft	Runway Dimensions	30-minute Drive Time Oregon Population	Associated City Population
CZK	Cascade Locks	Cascade Locks State Airport	0	1800 x 30	11,917	1,154
5S2	Crescent Lake	Crescent Lake State Airport	0	3900 x 30	1,096	122
00S	McKenzie Bridge	McKenzie Bridge State	0	2600 x 90	933	915
28U	Owyhee Reservoir	Owyhee Reservoir State	0	1840 x 30	0	0
PFC	Pacific City	Pacific City State Airport	5	1860 x 30	10,239	1,126
24S	Pinehurst	Pinehurst State Airport	7	2800 x 30	235	214
64S	Prospect	Prospect State Airport	1	4000 x 50	1,396	468
8S3	Santiam Junction	Santiam Junction State	0	2800 x 150	999	0
5S4	Toledo	Toledo State Airport	9	1750 x 40	17,510	3,507
R33	Waldport	Wakonda Beach State	3	2000 x 30	9,616	2,147
			25		53,941	9,653

Source: Aviation analysis, US Census, basedaircraft.com

### 6.6.3 Gaps in Airport Coverage

Oregon is 98,466 square miles with 95 system airports to serve the aviation community. Alternate airports are critical to pilots when flying to a destination airport as well as when traversing the state on long routes. For background, several airports, such as Alkali Lake State and Rome State, were developed to provide pilots an alternate airport in the case of aircraft mechanical issues as well as weather-related issues.

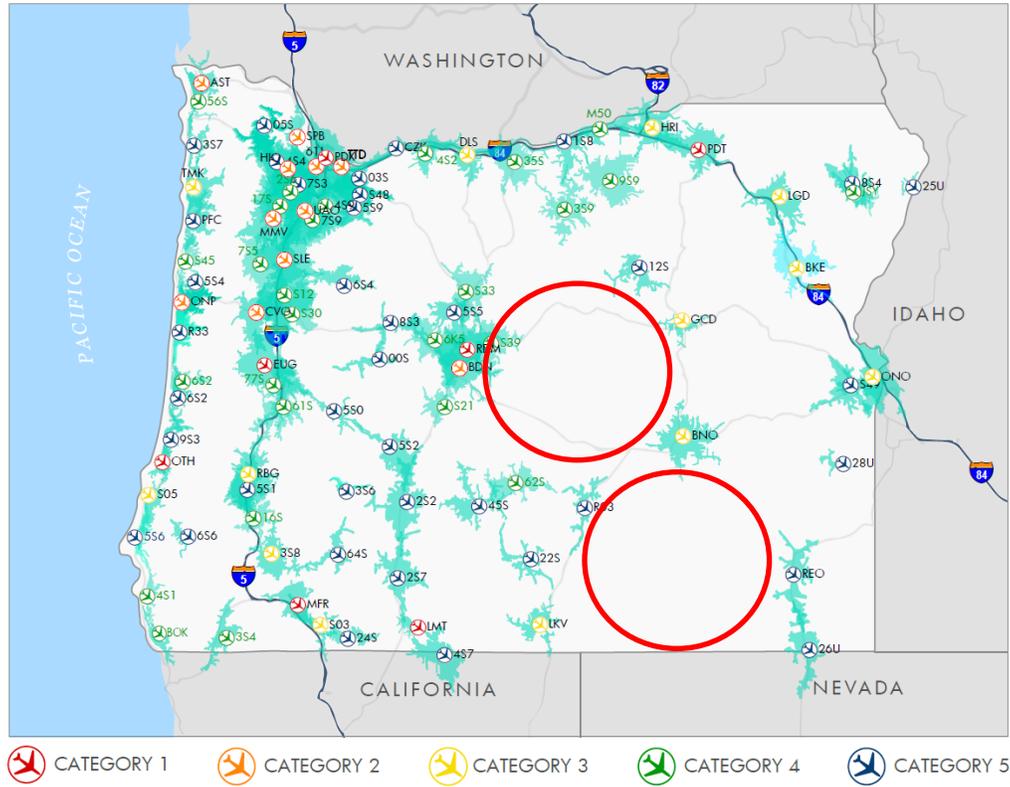
Analysis of Oregon’s system of airports indicates that there are two large geographic areas in the state that lack a system airport, Central Oregon and southeast/south-central Oregon, shown in **Figure 6-7**.

<sup>15</sup> <https://backcountrypilot.org/forum/destinations/backcountry-airport-database>

### Southeast/Southcentral Oregon Airport Coverage Gap

This is an area of approximately 11,500 square miles that lacks publicly owned public-use airports and system airports. By comparison, Idaho’s system of airports has a gap of approximately 9,000 square miles in the southwest corner of the state, while Montana has a gap of approximately 6,500 square miles. Nevada has a gap in the central portion of the state of approximately 15,000 square miles, an area largely composed of Military Operations Areas and bases.

FIGURE 6-7: SOUTHEAST/SOUTHCENTRAL OREGON AIRPORT COVERAGE GAP



Source: Jviation

The gap area in Oregon airport coverage is primarily in Harney County, but also includes portions of Lake and Malheur Counties. All airports listed by the FAA in this area are privately owned and private-use—no state or federal money is invested in these facilities. There are eight landing facilities in Harney County south of Burns Municipal, which is in the northern part of the county. These eight airports are listed in **Table 6-25**.

TABLE 6-25: LANDING FACILITIES IN HARNEY COUNTY

FAA ID	City	Airport Name	Runway Attributes
OG53	Andrews	Wildhorse Valley	3000 x 50 Dirt
OR32	Burns	Hooks Strip	2000 x 30 Turf
81OR	Burns	Wagontire	2000 x 80 Turf Dirt
7OR1	Crane	Arnold Airstrip	1500 x 30 Dirt
OR08	Diamond	Barton Lake Ranch	2200 x 75 Turf
2OG4	Fields	El Rancho	2500 x 50 Turf

FAA ID	City	Airport Name	Runway Attributes
OR09	Fields	Whitehorse Ranch	3247 x 94 Dirt
OR10	Frenchglen	Roaring Springs Ranch	6000 x 75 Asphalt

Source: FAA Registered Airports List, AirNav.com

One of the longest aircraft flight routes in the state between system airports is between McDermitt and Alkali Lake. The route is approximately 140 miles in length and has no state system airports to act as an alternate. Two private airports are located along this route, Whitehorse Ranch and Roaring Springs Ranch. Roaring Springs Ranch is approximately 80 miles northwest of McDermitt and 60 miles southeast of Alkali Lake. Roaring Springs has a paved 6,000-foot-long-by-75-foot-wide runway and is identified as an alternate runway when pilots develop their flight plan in this area. All airports noted in **Table 6-25** are privately owned and require calling in advance for permission to operate at their airport.

### Central Oregon Airport Coverage Gap

This is an area of approximately 7,500 square miles that lacks publicly owned public-use airports and system airports. The gap area in Oregon airport coverage is primarily in Crook County, north of US 20 and south of US 26. The area also includes portions of Lake and Harney Counties. There are five airports in Crook County that are private-use and privately owned, listed in **Table 6-26**. No state or federal money is invested in these facilities. Three of the airstrips are in proximity of Prineville, which is in the western part of the county. The most central airport in the county is Shotgun Ranch Airstrip. This airstrip is 1,650 feet long and paved. Crook County is heavily forested on mountain slopes and is consists of rangelands and irrigated agricultural fields. Identifying a location for a new airstrip may prove challenging due to terrain and limited paved road networks.

TABLE 6-26: PRIVATE AIRPORTS IN CROOK COUNTY

FAA ID	City	Airport Name	Runway Attributes
'42OR	Post	Shotgun Ranch Airstrip	1650 x 50 Asphalt
'OG21	Prineville	Dry Creek Airpark	3000 x 35 Asphalt
'29OR	Prineville	Sunrise Valley Ranch Lodge	1915 x 70 Turf
'6OR4	Prineville	Tailwheel	1700 x 100 Turf
'OR02	Redmond	River Run Ranch	2500 x 25 Dirt

Source: FAA Airport 5010 Form

The Recommendations section of this report discusses the airport coverage gaps in southeast and central Oregon.

## 6.7 Aviation System Action Program (ASAP) and Rural Oregon Airport Relief Program (ROAR)

In 2015, the Oregon State Legislature passed House Bill 2075 to increase the fuel tax on Aviation Gas (AV Gas) and Jet Fuel by .02 cents per gallon to invest in aviation for specific purposes. This resulted in the Aviation System Action Program (ASAP) Fund. The fuel tax increase became effective January 1, 2016 and currently has a sunset date of January 1, 2022. The ASAP Fund allocates and distributes the proceeds from the fuel tax increase among three new programs, in accordance with OL 2015 c.700 §7: COAR Grant Program, ROAR Program, and SOAR Program. The measure mandates ODA to distribute the revenue from the fuels tax increase for specific purposes. Per the legislation, five percent of the revenues will be appropriated to ODA for the costs to administer the program. The remaining ninety-five percent of the revenues shall be distributed as follows:



50 percent to COAR; 25 percent to ROAR and 25 percent to SOAR. More information on these programs are presented in **Chapter 7, Cost Estimating and Project Funding**.

Oregon Department of Aviation (ODA) assists rural communities in commercial air service through the Rural Oregon Aviation Relief (ROAR) Program. ODA identifies rural airports as an imperative asset to the aviation system since they play a critical role in the economic development of the surrounding local communities. The ROAR grants are an opportunity for ODA to learn from rural airports and work towards accomplishing their vision to better serve their communities needs and dynamic economies. The ROAR Grant Cycle is an open cycle that will run continuously. Applications will undergo a completeness review by ODA staff and be referred to the next most appropriate State Aviation Board for further review.

In 2018, ODA prepared a study *Assessing Demand for Rural Passenger Air Service in Oregon* — which assessed the potential demand for air passenger service throughout the state, focusing on rural areas<sup>16</sup>. The assessment described current trends in use of air service, identified the primary socioeconomic factors that correlate with demand for air travel and analyzed them spatially, to support Department decisions about where to make future investments in rural passenger air service.

## 6.8 Unmanned Aircraft Systems

Unmanned Aircraft Systems (UAS) is a quickly growing sector within the aviation industry. As the name suggests, a UAS is an aircraft without a human on board; it is operated by a pilot on the ground or by a computer program. UAS are increasingly used by private businesses and recreational users. The cost to operate a UAS is significantly lower than a piloted aircraft for several reasons:

- Pilot cost is lower
- Time in the air is shorter
- Power for a UAS is less expensive than fuel for conventional aircraft
- Maintenance can usually be done by the operator and at a lower cost than an aircraft

For these reasons, more businesses are opting to utilize UAS before hiring a manned aircraft. Businesses in Oregon are using UAS to survey forests and wildlife, monitor forest fires, photograph land, and mapping. The following section is summary of Federal rules and enacted Oregon State Legislation related to UAV operations within the state<sup>17</sup>.

### 6.8.1 FAA Reauthorization Act of 2018: Changes to Unmanned Aerial Vehicle (UAV) Policy

The FAA Reauthorization Act of 2018<sup>18</sup> established many changes to UAV policy, including changes to test sites, waivers, airworthiness, and various certificates. There are several prominent takeaways regarding new federal UAV policy. First, it advances the commercial UAV industry, by ensuring that the legal and structural framework are in place for UAVs to be integrated into the airspace. Second, is that the legislation moderates some of the potential dangers of UAV use, by adding additional departmental oversight on UAV policy. The last takeaway is the legislation evaluates or reevaluates some UAV regulations, like studying its UAV registration system to

<sup>16</sup> [https://www.oregon.gov/aviation/docs/EcoNW\\_Task\\_2\\_Current\\_Demand\\_2018-0108.pdf](https://www.oregon.gov/aviation/docs/EcoNW_Task_2_Current_Demand_2018-0108.pdf)  
[https://www.oregon.gov/aviation/docs/EcoNW\\_Task\\_2\\_Demand\\_Indicators\\_Maps\\_2018-0108.pdf](https://www.oregon.gov/aviation/docs/EcoNW_Task_2_Demand_Indicators_Maps_2018-0108.pdf)  
[https://www.oregon.gov/aviation/docs/EcoNW\\_Task\\_4\\_Case\\_Studies\\_2018-0108.pdf](https://www.oregon.gov/aviation/docs/EcoNW_Task_4_Case_Studies_2018-0108.pdf)

<sup>17</sup> [https://www.oregonlegislature.gov/citizen\\_engagement/Reports/BB2016UnmannedAircraftSystems.pdf](https://www.oregonlegislature.gov/citizen_engagement/Reports/BB2016UnmannedAircraftSystems.pdf)

<sup>18</sup> <https://www.commerce.senate.gov/public/cache/files/7e6c1d57-cf33-4c29-98de-a001b4cbb124/CB8D422BD3527207F7A8C7274B2FE45D.faa-reauthorization-act-of-2018-section-by-section.pdf>

determine compliance, and launching a pilot program which would use remote drone identification for its reporting system.<sup>19</sup> This law enables the UAVs and is likely to accelerate progress in the industry.

#### *Beyond the Visual Line of Sight (BVLOS)*

The FAA Reauthorization Act of 2018 calls for the FAA to establish regulations that would permit UAV flight Beyond the Visual Line of Sight (BVLOS) of its operator. The first permit was offered to Avitas Systems, which specializes in custom aerial inspection systems for oil, gas, electric power, and transportation. The permit would allow Avitas Systems to operate a large, 55lb+ heli-drone in Loving County, Texas. Instead of a second human observer on the ground (as previously required) the drone will rely on ground-based radar to detect and avoid other aircraft in its airspace.

The heli-drone will be operated in an isolated area of Texas and will perform inspection services for Shell Oil, by monitoring infrastructure and detecting leaks. Avitas Systems is the first of many U.S. companies waiting in line for the regulatory approvals to deploy drones in this manner, whether for parcel or food delivery, disaster response, and UAV flight instruction. This new regulation is expected to open the door for many existing and future technologies to replace the idea of the second person observer completely<sup>20</sup>.

#### *UAV Security Issues*

As the FAA evaluates how the FAA Reauthorization Act of 2018 affects recreational flyers, those individuals are expected to follow current policies.<sup>21</sup>

The Preventing Emerging Threats Act, Division H of the FAA Reauthorization Act of 2018, allows both the Department of Justice and the Department of Homeland Security to “track, warn, disable, seize, damage, and destroy unmanned aerial vehicles”<sup>22</sup> that are determined to pose a credible threat to people, facilities, or assets. This gives this authority to agencies within these departments, regardless of whether a warrant has been obtained. This has given concern to those using drones for commercial or personal use, especially those who fly their drones near high profile events or facilities. It is possible that innocent UAVs could be identified as a credible threat and treated as such.

The FAA Reauthorization Act of 2018 also establishes drone flight restrictions near U.S. Navy and U.S. Coast Guard vessels operating near Naval Base Kitsap, Washington, and Naval Submarine Base, Kings Bay, Georgia. These restrictions state that drone operations must occur a distance of at least 3,000 feet laterally and 1,000 feet vertically from the ships and submarines. The FAA also advises that drone operators remain clear of DOD and DOE facilities and mobile assets. Those who ignore that caution and whose drone flights are perceived to be a safety or security threat may have their drones disrupted, seized, damaged, or destroyed.

#### *UAV Recreational Flying*

The Reauthorization Act repealed Section 336 of the 2012 FAA Modernization and Reform Act, repealing the special rule for model aircraft, thus closing what is known as the “hobbyist loophole.” This loophole prevented the FAA from establishing hard limits on drone use for recreational UAV fliers. Recreational unmanned aircraft flight is now classified as “Recreational Operations of Unmanned Aircraft,” whereas before it was considered model aircraft flight. Now, the recreational fliers must abide by more stringent rules, including a 400-foot flight limit. Operations in restricted areas, interference with manned aviation, the firing of a weapon, commercial

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<sup>19</sup> <http://uasmagazine.com/articles/1933/what-does-the-faa-reauthorization-act-mean-to-the-uas-industry>

<sup>20</sup> <https://www.manatt.com/Insights/Newsletters/Client-Alert/FAA-Approves-First-Radar-Assisted-BVLOS-Drone-Oper>

<sup>21</sup> <https://www.faa.gov/news/updates/?newsid=91844>

<sup>22</sup> <https://www.natlawreview.com/article/faa-reauthorization-act-2018-raises-concerns-among-unmanned-aerial-vehicle-community>



operations that violate privacy policies, and interference with emergency responders are all now prohibited.<sup>23</sup> An aeronautical and safety test is in development for recreational fliers, and the FAA has up to 6 months from October 2018 to develop this test. They have stated that it will be developed in consultation with UAV manufacturers, industry stakeholders, and community-based organizations.<sup>24</sup>

Section 372 of the law requires the FAA to establish a program for remote detection and identification that law enforcement could use to track drones which violate regulations. Government entities now also have the authority to punish violators with fines of up to \$25,000.

### *Commercial Delivery Drones and Fees*

Under this new law, the FAA has one year to update its regulations to allow drones in U.S. airspace to carriage private property. This would allow drones to deliver products to consumers, which was previously prohibited, except in rare circumstances. The rulemaking process will shape the regulation over the next year, but it is likely that there will be performance-based requirements, aircraft worthiness certifications, and operation specifications based on the type of flight and who is operating the UAV.<sup>25</sup>

The FAA and Government Accountability Office (GAO) is also required to study how the federal government could raise money for a future unmanned aircraft system traffic management (UTM) that would be key to facilitating the use of UAVs for package delivery and other operations beyond visual line of sight. The revenue required for this system is likely to come from fees charged for air traffic services. The study regarding these fees is due from the GAO six months from October. Citing industry estimates, the FAA said the new rules could generate over \$82 billion in economic activity across the United States, and potentially create more than 100,000 new jobs over the next 10 years.<sup>26</sup>

## **6.8.2 State Regulation and Registration**

### *HOUSE BILL 2710 (2013)*

In 2013, House Bill 2710 established that law enforcement may only use UAS with a warrant or with probable cause and exigent circumstances, search and rescue efforts, training, or crime scene reconstruction. The measure also prohibited public bodies from operating UAS that are capable of firing a bullet or other projectile.

HB 2710 gave individuals a private right of action to sue a drone operator in civil court for flight over the person's property. In order to go to court, an operator must have flown at an altitude of less than 400 feet over the individual's property and the individual must have notified the operator not to fly overhead. If successful, the plaintiff could be awarded attorney fees and treble damages, in addition to a court order prohibiting the operator from flying over the property.

Additionally, the measure required public bodies to register any UAS in its use with the Oregon Department of Aviation. This registration requirement is in addition to any federally required registration.

### *HOUSE BILL 2354 AND HOUSE BILL 2534 (2015)*

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<sup>23</sup> <https://dronelife.com/2018/10/19/when-do-things-change-for-recreational-operators-the-faa-reauthorization-timeline/>

<sup>24</sup> <https://www.gpsworld.com/faa-restricts-drones-near-dod-and-uscg-ships-subs/>

<sup>25</sup> [https://www.hklaw.com/AviationLawBlog/Federal-Aviation-Administration-FAA-Reauthorization-Act-Paves-the-Way-for-Federal-Regulation-of-Delivery-Drones-10-23-2018/?utm\\_source=Mondaq&utm\\_medium=syndication&utm\\_campaign=View-Original](https://www.hklaw.com/AviationLawBlog/Federal-Aviation-Administration-FAA-Reauthorization-Act-Paves-the-Way-for-Federal-Regulation-of-Delivery-Drones-10-23-2018/?utm_source=Mondaq&utm_medium=syndication&utm_campaign=View-Original)

<sup>26</sup> [https://www.oregonlive.com/window-shop/index.ssf/2016/09/drones\\_oregon\\_industry.html](https://www.oregonlive.com/window-shop/index.ssf/2016/09/drones_oregon_industry.html)

In 2015, House Bill 2354 made small adjustments to the provisions of HB 2710. It removed the 400-foot flight restriction for bringing a private action. Additionally, the measure updated the terminology used in Oregon statutes to provide consistency with federal rules.

Meanwhile, House Bill 2534 prevented the use of UAS for hunting, angling, tracking, trapping or locating wildlife, while also prohibiting the use of UAS to interfere with hunters, anglers, or trappers.

#### *HOUSE BILL 4066 (2016)*

During the 2016 session, House Bill 4066 addressed numerous new and recurring UAS issues. The measure extended the prohibition on operating a UAS capable of firing a bullet or projectile to all users, not just public bodies, and made it a Class A misdemeanor to do so. It removed UAS from the felony crime of endangering an aircraft, thereby avoiding significant criminal prosecution against a person who might down a UAS with a towel, broom or other device or weapon. Concurrently, the measure created a new violation of reckless interference with an aircraft.

For public bodies using UAS, the measure required them to establish policies and procedures for the use, storage, access, sharing, and retention of data collected through use of UAS. The policies must be in place and made available to the public by January 1, 2017.

The measure acknowledged a conflict with federal law regarding FAA authority and the private right of action. The FAA has sole authority to restrict and regulate commercial flight. A properly authorized commercial operator has authority to fly according to FAA rules and regulations. The private right of action enjoining all flights over private property could create a conflict with that federal authority. As such, HB 4066 created an exception to the private right of action for UAS flown in compliance with FAA authorizations.

Finally, HB 4066 created a new violation, for when a person knowingly or intentionally operates a UAS within 400 feet over a critical facility or makes contact with a critical facility with the UAS. Critical facilities include correctional facilities, power stations, chemical manufacturing plants, petroleum refineries, ports or other freight terminals, dams and oil pipelines.”

### **6.8.3 UAS Operations and Activity in Oregon**

UAS are also being used for disaster relief. In 2017, a team from Oregon called Insitu used UAS in recovery operations in Texas, Oregon, and California. Information gathered by UAS allowed for faster, up-to-date information and allowed responders to act quickly.

A ScanEagle is one type of UAS owned and operated by Insitu that has been used to assist in wildland firefighting activity. The UAS has a flight route is programmed into the aircraft’s computer allowing the aircraft to fly the route precisely without ground based remote control. The advantage of this type of UAS is that it can be flown in many conditions, such as heavy smoke, where manned aircraft cannot. In October of 2017 a ScanEagle was used to gather data on the wildfire at Eagle Creek. The Eagle Creek fire burned nearly 50,000 acres throughout the Columbia River Gorge region and forced many residents to evacuate their homes to escape the blaze.

According to Insitu, the ScanEagle was “operating during dense smoke conditions or at night, when manned aircraft typically are grounded due to hazardous flying conditions for pilots.”<sup>27</sup> During ScanEagle operations and in hazardous conditions, air traffic controllers, nearby airports, and pilots worked together to keep the skies clear and safe for all involved. In this instance, a notification was sent out to warn aircraft in the area of

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<sup>27</sup> <https://insitu.com/press-releases/Insitu-Flies-ScanEagle-for-Disaster-Relief-and-Fire-Suppression>

the flight activity and the FAA closed airspace to manned aircraft in the vicinity of the fire. In most disaster recovery programs, notifications are sent out to keep everyone involved safe.

As UAS are integrated into the National Airspace System, it will be imperative for airports to expand their efforts to allow for UAS operations. Oregon has been a vital part of this effort thus far and will continue to be a large part of this airspace change as UAS grow in size and number.

#### 6.8.4 UAS Research in Oregon

In 2013, the FAA announced the University of Alaska, Fairbanks as one of six test sites for UAS flight research. Per the FAA, the test sites “will allow the agency (FAA) to develop research findings and operational experiences to help ensure the safe integration of UAS into the nation's airspace.” UAS research also allows businesses to determine how to apply this technology to everyday situations.

The University established the Alaska Center for Unmanned Aircraft Systems Integration (ACUASI) for the specific purpose of UAS research and development. The Pan-Pacific UAS Test Range Complex (PPUTRC) is the specific area managed by ACUASI.

“The PPUTRC spans seven climate zones, allowing UAS manufacturers and potential users to test their equipment in the Arctic, the tropics, and in arid environments...Oregon’s team includes three fixed test ranges. The locations of these test ranges are as follows: Eastern Oregon Airport at Pendleton; The Tillamook uncontrolled public airport and managed by Near Space, Inc.; Warm Springs Reservation, managed by VDOS, Inc. on behalf of the Confederated Tribes of Warm Springs. The Oregon ranges offer a variety of terrains, weather conditions, and flight environments, expanding on Alaska’s characteristics.”<sup>28</sup>

#### Tillamook Airport UAS Test Range

FIGURE 6-8: TILLAMOOK UAS TEST RANGE



Source: Near Space Corporation

<sup>28</sup> <http://acuasi.alaska.edu/pputrc>

The Johnson Near Space Center, located at Tillamook Airport, first began operation in the spring of 2013. The center was custom designed to facilitate NSC's high altitude balloon flight testing that it conducted for both government and commercial entities. The state-of-the-art balloon facility houses NSC's engineering, production and flight operations, and includes a large integration hangar and dedicated control tower, as well as a 100-acre launch area.

The Tillamook UAS Test Range became operational in November of 2015. The upgrade will allow NSC to competitively address the emerging UAS test flight market and increase the number of flights at the Tillamook UAS Test Range along with supporting unique high altitude (up to 130,000 feet) flight tests of unmanned balloons, drones, and hybrid aircraft.

The combined operations of the Johnson Near Space Center and Tillamook UAS Test Range offers a truly unique state of the art flight test facility, instrumented range, access to a wide array of testing environments, professional range support, and the ability to provide expedited flight approvals for testing of unmanned technologies.

### **Warm Springs UAS Test Range**

The Warm Springs UAS Test Range is a key testing facility for the Pan-Pacific UAS Test Range Complex, and is the only site owned and operated by a Native American tribe on tribal land. Located on the high desert of Central Oregon, the Warm Springs UAS Test Range provides both startups and established industry participants the easy access to the wide open spaces of central Oregon. Warm Springs is located on the dry side of the Cascades, averaging 325 Visual Flight Rules (VFR) days per year, making the range testable almost all year long. The Warm Springs Test Range is managed by VDOS, Inc. on behalf of the Confederated Tribes of Warm Springs.

VDOS secured the UAV test sites in Oregon as part of the University of Alaska bid for FAA test sites. VDOS specializes in using UAVs for inspection services and data collection. Until now the company has used manned aircraft to perform work or has worked with government clients and customers flying in restricted airspace.

In 2017, the Warm Springs FAA UAS Test Range expanded its operations to Prineville and Madras Airports to support UAS industry growth. The expansion project will allow Warm Springs to support UAS clients who require an airport for launch and recovery as well as having certified aircraft maintenance facilities available.

FIGURE 6-9: IDAHO NATIONAL LABS FLIGHT TESTING IN SUPPORT OF THE US MARINES



Source: Idaho National Laboratory

### **Pendleton UAS Test Range**

Pendleton UAS Test Range (PUR) offers both conventional and unconventional takeoff and landing capability from Eastern Oregon Regional Airport (PDT). PUR is a leading partner in the Pan-Pacific UAS Test Range Complex. The airport enjoys 347 VFR days per year and can accommodate up to a Boeing 757.

In addition to two conventional runways (6,300 feet, 5,581 feet), the airport provides a 2,800-foot UAS dedicated strip and a full-service UAS operating area with available dark fiber connections. PDT offers a blend of different aircraft operations, cargo, charter, passenger, experimental, SAR, law enforcement, agricultural imaging and chemical application, geophysical research, commercial unmanned, and military manned and unmanned operations.

Beyond the airfield in Pendleton, the UAS Test Range extends over 14,000 square miles: north to the Columbia River; east over the Blue Mountains and Umatilla National Forest; south into the Elkhorn Mountains; and west to the borders of Restricted Area 5701 (R-5701) to allow easy access for specialty testing (Oregon's only restricted airspace). R-5701 is the only low-altitude electronic attack training airspace in the Pacific Northwest.

FIGURE 6-10: ARCTIC SHARK UAS FLIGHT TESTING IN PENDLETON



Source: SUAS News



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