

## **Chapter 6      Special Considerations**

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Aviation programs and technology are constantly evolving to provide a safer and more efficient operating environment while meeting the needs of system users. The State of Oregon continuously reviews new technologies that could enhance the aviation system throughout the state. This chapter examines a variety of topics being discussed at the national, state, and local level that will ultimately affect the state aviation system. Oregon continues to be an aviation pioneer by addressing these issues early and implementing strategies to accommodate the future growth of the state and national aviation system.

### **6.1 Northwest Regional Air Service Initiative**

In response to declining levels of air service in the Pacific Northwest, the Northwest Regional Air Service Initiative (NWRASI) program was created by the Oregon Department of Aviation, Washington Department of Transportation – Aviation, Oregon Airport Management Association, Washington Airport Management Association, and the Federal Aviation Administration. The purpose of the program is to assist small communities in Oregon and Washington with local air service issues. The following paragraphs provide an overview of the Initiative.

#### **6.1.a Overview**

The Initiative provides communities with the information they need to determine service demands, financial feasibility, and implementation strategies for air service. When properly supported and utilized, air service in smaller communities can have positive impacts on the local economy. The ultimate goal of a regional approach to expansion of air service is that it can produce a strong, sustainable network of successful airports.

There are three primary goals of the Initiative:

1. Improve air service to a broad section of the Oregon and Washington traveling community.
2. Provide better access from secondary markets in Oregon and Washington to the national air transportation system.
3. Engage small communities in Oregon and Washington in finding solutions to regional air issues.

In order to achieve these goals, the Initiative points out a three-tiered strategy:

1. To provide all secondary communities in Oregon and Washington that desire air service improvements with self-help tools to understand, evaluate, and become actively engaged in air service solutions at the local level.

2. To identify secondary communities in Oregon and Washington that can support enhanced or new air service.
3. To develop strategies for implementing broad air service improvements across the two states.

### **6.1.b Trends**

Smaller airports produce a relatively small share of airline passenger traffic (11 %), but small hub, non-hub, and non-primary facilities outnumber large and medium-sized hubs (442 to 66). In recent years, the airline industry has been volatile for many reasons. Fluctuation in fuel cost, increased threat of terrorist attack, issues with fleet efficiency and several other factors have caused financial losses in the airline industry every year since 2000, while passenger numbers increase. Airlines focus on markets that generate the bulk of their business, so smaller communities have faced additional adversity of late.

### **6.1.c Role of the Community**

Because airlines rarely have the time or resources to determine local market demand and project feasibility, the NWRASI emphasizes that it is the responsibility of a community to determine these requirements. Before trying to entice airlines with subsidies or price breaks, a community must first justify the level of service it can support. The initiative is composed of three phases that must be completed in sequential order before air service improvements may begin.

Phase I is a tool kit to help individual communities understand the complex issues that contribute to air service problems in the Northwest. This kit describes national and regional trends in aviation and the economy and provides baseline information about the required steps to participate in NWRASI.

Phase II is perhaps the most critical element in the NWRASI process because it requires the collection and analysis of air travel data for the community. This phase includes a market analysis with description of resources and process and funding options.

A market analysis provides insight to a community's true market size and achievable levels of service and destinations. Detailed outcomes of the study identify alternative airports used by members of the community, historical passenger data, travel destinations, frequented airlines, and passenger destinations by volume. Service gaps and opportunities for multiple airlines are also assessed.

In addition, a description of resources and process is required. Industry sources including Marketing Information Data Tapes (MIDT), schedule data such as Official Airline Guide (OAG), and DOT Airline Reports provide information about a market's potential and may identify trends to help officials understand the nature of the air service market. Local resources like business traveler surveys are particularly beneficial in this step.

The third phase of the Initiative researches and evaluates strategies to secure air service improvements in communities that demonstrate that their respective markets can support such improvements and that also display community support. Phase III uses a regional approach to consider the overall air service needs of smaller communities in Washington and Oregon and evaluates alternative options and strategies to secure air service improvements.

## 6.2 Very Light Jets

In 2006, the FAA certified the first very light jets (VLJs) to fly in the National Airspace System (NAS). These new vehicles have sparked debate about the future of passenger travel and the aviation industry as a whole. This section will describe what VLJs are and provide information about VLJ industry trends and expectations.

### 6.2.a Overview

The FAA defines a very light jet (VLJ) as an aircraft that weighs 10,000 pounds or less maximum certified takeoff weight, certified for single pilot operations, and priced below other business jets. In addition, VLJs possess at least some of the following features:

- 1) Advanced cockpit automation, such as moving map GPS and multifunction displays
- 2) Automated engine and systems management
- 3) Integrated auto-flight, autopilot, and flight guidance systems

FAA officials have stated that procedures and policies are in place to successfully integrate VLJs into the NAS because they will operate similarly to other aircraft in the current fleet. However, FAA is taking additional steps to address specifically any unique issues that might affect the product's integration.

### 6.2.b Trends and Expectations

In August 2007, the FAA published a document entitled, *Very Light Jets – Several Factors that Could Influence Their Effect on the National Airspace System*. The report examined eight industry forecasts and estimates that roughly 3,000 to 7,600 VLJs will be delivered between 2016 and 2025. Several factors influence the variation in figures and dates-primarily the assumptions that were used (or not used). The forecasts tended to focus on development of the air taxi market, economic growth, production constraints, insurance and training requirements, and expected aircraft retirements, among others.

It is expected that VLJs will be used in similar fashion as other types of general aviation aircraft, such as in corporate fleets and as business or other personal aircraft. The FAA notes that the most critical and most speculative factor in the future of VLJ deliveries will be the extent to which a market for air taxi services using the jets will develop.

In an April 2007 report that examined commercial aviation service options for small communities, the FAA noted that current VLJ business models indicated operators would provide premium point-to-point service between cities larger than the communities eligible for the Essential Air Service program (EAS). One company, DayJet, has already begun point-to-point air service in the Southeast, and could prove to be a model for commercial VLJ operations.

Due to reliance on an emerging air taxi market, the future of VLJs appears volatile, but there is speculation that other factors will also affect plane deliveries:

- *Replacement market* – Customers may wish to upgrade their aircraft to a VLJ based on its technological capabilities; also, it is expected that a large number of aircraft will be retired in the future, which would increase demand
- *Number of aircraft models* – There is a large number of VLJ models that are expected to be available to consumers. The range of capabilities and prices might strengthen demand
- *Dissatisfaction with other forms of transportation* – Increased difficulty associated with commercial airline and automobile travel may lead to higher demand for VLJs
- *Low purchase price and operating costs* – VLJs are relatively inexpensive compared with other models of turbine aircraft (\$1.5m-\$3m versus \$5m-\$10m)
- *Access to airports with appropriate infrastructure* – Manufacturers believe that VLJs will be able to use a relatively large number of private and public airports and perhaps increase demand. Conversely, infrastructure needs such as hangars and ground transportation at these facilities might limit access and hinder demand
- *Training and insurance requirements* – Potential pilots may decide that the time and money needed to achieve acceptable levels of training and insurance prove burdensome, which may affect their willingness to fly VLJs
- *Production constraints* – The ability of aircraft manufacturers to produce enough VLJs to meet demand may influence the number of aircraft delivered.

Despite wide speculation of VLJs and their sales, manufacturers and FAA believe that integration into the market will be gradual. This can be beneficial, as any problems with the new jets and how they operate in the NAS can be dealt with in a timely and orderly fashion.

### **6.3 Area Navigation (RNAV)**

This section is a summarization of RNAV (Area Navigation) and its applicability to aviation in Oregon, it outlines the functions of RNAV, identifies its capabilities, and delineates airports in Oregon that are the best candidates for upgrading to RNAV.

### 6.3.a Overview

Per the FAA, Area Navigation (RNAV) can be defined as a method of navigation that permits aircraft operation on any desired course within the coverage of station-referenced navigation signals or within the limits of a self-contained system capability, or a combination of these.<sup>1</sup>

RNAV was developed to provide more lateral freedom and thus more complete use of available airspace. This method of navigation does not require a pilot to track directly to or from any specific radio navigation aid, and has three principal applications:

1. A route structure can be organized between any given departure and arrival point to reduce flight distance and traffic separation;
2. Aircraft can be flown into terminal areas on varied pre-programmed arrival and departure paths to expedite traffic flow; and
3. Instrument approaches can be developed and certified at certain airports, without local instrument landing aids at that airport.

### 6.3.b RNAV in Oregon

In fall 2007, the ODA prepared a list of Oregon public use airports where RNAV would be most suited for application. ODA conducted a review, evaluation, and selection based on nine primary components. These components include:

1. An inventory of Oregon's 97 airports was conducted to determine which airports had already updated their navigation systems.
2. The *2000 Oregon Aviation Plan* was reviewed to identify airports that did not meet minimum instrument approach standards.
3. Airports that were already slated for navigation system upgrades were removed from the list.
4. A draft of the *Oregon Aviation Plan 2007 (OAP 2007)* provided region and airport specific information for Instrument Approach Procedure (IAP) development.
5. The *OAP 2007* was reviewed to identify which airports needed instrument approaches.
6. The *2002 Oregon GPS Survey/Study System Assessment* served as a primary reference in its evaluation of minimum standards and review of relevant conditions at Oregon's public use airports.
7. A list of 16 candidate airports was developed.
8. Seven non-state airport sponsors were contacted to verify interest and ability to support a navigation instrument upgrade.
9. A need-based list of candidate airports was produced, as illustrated in **Table 6.1**.

**Table 6.1 Recommended Airports for RNAV Approach**

<i>Priority</i>	<i>Airport</i>	<i>Runway</i>
1	Southwest Oregon Regional Airport	04
2	Scappoose Industrial Airpark	15
3	Ontario Municipal Airport	32
4	Creswell Hobby Field	15
5	Portland – Mulino Airport	32
6	Siletz Bay State Airport	17
7	Bandon State Airport	16
8	Cape Blanco State Airport	32
9	Independence State Airport	16
10	Brookings-Curry County	30

Source: Oregon Department of Aviation

## 6.4 Automatic Dependent Surveillance – Broadcast (ADS-B)

Route frequency has increased in the U.S. in recent years, which leads to more congested airports. The increase in flights has corresponded with an increase in aircraft accidents and “close calls”. For years, authorities have examined implementation of a national and/or global positioning system. This section provides a brief summary of a new technology in the aviation industry, Automatic Dependent Surveillance – Broadcast (ADS-B) which may play a critical role in the national navigation system.

### 6.4.a Overview

ADS-B is a technology that allows pilots in the cockpit and air traffic controllers on the ground to track aircraft traffic with more accuracy than other systems, specifically radar. ADS-B relies on the Global Navigation Satellite System to determine an aircraft’s precise location. The position data is combined with other information such as aircraft type, speed, altitude, and flight number. The information is converted into a digital message and broadcast via a radio transmitter.

There are two components to the system. The first is an on-board transponder that emits a continuous signal. The second component is a ground-based transceiver that gathers location information and projects it onto a vehicle tracking/surface moving map used by pilots and air traffic controllers.

### 6.4.b Advantages of ADS-B

Proponents of the new technology point to several advantages:

- ADS-B improves safety by giving pilots and controllers reliable, accurate, real-time information about aviation traffic and can report aircraft positions to +/- 25 feet, more accurate than a quarter to a half-mile for radar

- Because the system has an effective range of 100-200 miles, ADS-B provides a greater margin to implement conflict detection and resolution than is currently available
- ADS-B can signal while an aircraft is grounded. This provides safer, more efficient taxi operations and results in greater airport capacity
- The system has proven to be successful with regards to safety and was first used in Alaska where accidents declined 40 percent (40%) after implementation
- As part of its NextGen system, the FAA has requested in its budget \$85 million in 2008 and \$564 million over the next five years for ADS-B infrastructure development, demonstration, and implementation

#### **6.4.c Disadvantages of ADS-B**

Some key issues with ADS-B have been identified. These include:

- General aviation (GA) operations will be linked to the Universal Access Transceiver while commercial operations will link with the 1090 MHz squitter. These frequencies are incompatible, which means, to date, the vehicle tracking/surface moving map might not depict both frequencies
- The targeted implementation date for onboard avionic transponders is 2014 for commercial aircraft and 2020 for all aircraft. Since funding mechanisms for the system are unidentified at this time, it is questionable whether system-wide installation will be achieved by the target dates
- The 1090 MHz frequency for commercial operations has been used in Europe. Based on experience with the same frequency, some officials there predict system overload in the early 2010's. Despite greater space across the U.S., some remain skeptical

#### **6.4.d ADS-B in Oregon**

Oregon is part of the FAA's Legacy Program. This means that unlike other states, Oregon's ground transceivers will be supplied and purchased by the FAA. This saves money and ensures the FAA will provide dual station coverage in the event that the primary ADS-B ground station fails. In return, the state will continue to encourage GA pilots to purchase transponders, and report ADS-B usage to the FAA. Currently, there are three operational ground stations in Oregon:

- Salem - McNary Field
- Eugene – Mahlon Sweet Field
- Medford – Rogue Valley International – Medford Airport

In 2006, Sensis Corporation received a *ConnectOregon* grant to install stations at six additional airports. The following airports are slated for installation in October 2007:

- North Bend – Southwest Oregon Regional Airport
- Redmond – Roberts Field Airport
- Burns – Burns Municipal Airport
- Ontario – Ontario Municipal Airport
- Pendleton – Eastern Oregon Regional Airport
- John Day – Grant County Regional Airport / Ogilvie Field

Assuming that each station provides service for a 110-mile radius, these locations will account for coverage across most of Oregon. With additional stations soon to be installed in Nevada, Washington, Idaho, and northern California, the entirety of the state will soon have ADS-B coverage.

## 6.5 Air Traffic Control Towers

Air traffic control towers provide ground based air traffic controllers who are responsible for the movement of aircraft on the ground and in the air. The primary responsibility of the controller is to separate aircraft laterally, vertically, and longitudinally to prevent them from coming too close together. Additional responsibilities of controller's include ensuring safe, orderly and expeditious flow of traffic and providing information to pilots, such as weather, navigation information and notices to airmen.

The following Oregon airports have an active air traffic control tower:

- Eastern Oregon Regional Airport at Pendleton (Category I)
- Mahlon Sweet Field (Category I)
- Klamath Falls Airport (Category I)
- Portland International Airport (Category I)
- Redmond Municipal Airport – Roberts Field (Category I)
- Rogue Valley International – Medford Airport (Category I)
- McNary Field (Category I)
  
- Portland Hillsboro (Category II)
- Portland Troutdale (Category II)

Two Oregon airports are currently coordinating with the FAA and ODA regarding the siting requirements for a new air traffic control tower. Those airports are:

- Aurora State Airport (Category II)
- Southwest Oregon Regional Airport (Category I)

The Federal Aviation Administration (FAA) has specific criteria for the siting of a new air traffic control tower or the relocation of an existing tower. The following FAA advisory circulars and Orders should be consulted for specific requirements:

- Advisory Circular 150/5300-13, *Airport Design*
- Order 6480.4A, *Air Traffic Control Tower Siting Criteria*
- Order 6480.7C, *Airport traffic Control Tower and Terminal Radar Approach Control Facility Design Guidelines*
- Order 8260.3, *United States Standard for Terminal Instrument Procedures (TERPS)*

## 6.6 Emergency Services Supported by Aviation

In addition to providing air transportation services for the state and region, Oregon's airports also provide support for emergency response. Airports provide facilities for timely response to a natural disaster, be it an earthquake, tsunami, or weather-related event, or a public health issue, such as bioterrorism. Oregon's array of terrain, including mountains, valleys, deserts, and coasts, can make direct travel difficult, such that air transportation is often the most direct and efficient, especially for time-critical matters.

In times of need, Oregon airports become essential to emergency response operations. Other times, airports allow for preparedness for such situations. Some airports exist primarily to support emergency planning, operations, and training. These airports may be operational only seasonally, to support response to recurring events, such as forest fires.

Airports often provide an operations base, staging facility for operations, and interaction between airside and landside services and equipment. As many airports have large areas of vacant land, secure areas, and large paved or hard-surfaced areas, temporary emergency response facilities and parking can be readily accommodated. Emergency response aircraft include both fixed wing and rotorcraft, used for reconnaissance, firefighting, personnel and equipment delivery and evacuation.

Depending on the nature of the issue, different agencies operating in Oregon contribute varying roles of support to local and regional emergencies. The agencies work cooperatively with each other and with the ODA to manage resources and situations. Consideration should be given to the proper ownership, operation, and maintenance of each emergency service airport and the emergency-related facilities at public airports so the appropriate governmental entity controls and is responsible for a particular airport or feature.

### 6.6.a Medical Support

The Oregon Trauma Program, administered by Oregon Department of Emergency Medical Services, coordinates access to medical care facilities throughout the state. Four trauma levels

are defined, ranging from the most advanced medical facilities to smaller community or rural hospitals. Using ambulance, fixed-wing and rotor aircraft, patients are transported from lower to higher level trauma facilities based on their condition and need for specific types of medical care. Oregon is currently served by three medevac flight programs: Portland and Corvallis (Life Flight Network), Bend (Air Life), and Medford (Mercy Flights). In addition, flight programs based in Boise, Wenatchee, Spokane, Moses Lake, Puyallup, and Seattle also serve Oregon.

Oregon has 46 medical facilities included in the trauma program, in addition to four facilities located out of state (Boise, Crescent City, and two in Walla Walla). Every medical facility included in the trauma program has an airport located within a 30-minute drive time. **Figure 6.1** illustrates the medical facilities' proximity to the system airports.

According to the Oregon Department of Human Services, trauma hospitals are distinguished from other facilities in that they guarantee the immediate availability of surgeons, anesthesiologists, physician specialists, nurses, ancillary services, and resuscitation life-support equipment on a 24-hour-a-day basis, dedicated to the care of trauma patients. Trauma facilities are designated or categorized as Level I, II, III, or IV, with Level I and II centers offering the highest level of care.

There are five Trauma Level I or II facilities in Oregon (two in Portland, one each in Bend, Eugene, and Springfield), which provide the highest level of care available. All of these facilities are located within 30 minutes of a Level I – Commercial Service Airport.

There are 20 Trauma Level III facilities located in Oregon. These facilities often serve large outlying areas or regions. With the exception of Tillamook, all of these facilities are located within 30 minutes of an airport with instrument approach capabilities. Tillamook does provide automated weather observation but does not provide instrument approach capabilities.

All of the local hospitals classified as Trauma Level IV facilities have an airport located within 30 minutes. Several of these airports have instrument approach and/or automated weather observation needs identified including Florence, Gold Beach, and Lexington.

Oregon's network of medical facilities is well connected to the aviation system. The combination of fixed wing and rotor aircraft provides a comprehensive level of coverage for most Oregonians. All hospitals included in the trauma program are located within 30 minutes of an airport. Some airports, particularly in smaller communities, have instrumentation or weather observation needs that are related to meeting basic all-weather medevac requirements.

### **6.6.b Fire Protection**

Wildfires are one of the most destructive natural hazards facing much of Oregon. Wildfires pose a threat to life and property and are particularly dangerous where the natural environment meets developed areas. However, wildfires are a natural event intended to burn off a build up of

vegetation. Several side effects of wildfires include erosion, landslides, introduction of invasive species, and changes in water quality. These secondary effects as determined by the United States Geographical Survey are often more disastrous than a wildfire itself.

Oregon contains almost sixteen million acres of private or public forestland. Nearly four million acres of the forestland is considered wildland-urban interface, which are forestlands with residences and other structures within the reach of wildfire. Protection of life, property, and natural resources in these areas are vital to the state of Oregon. Aviation plays a critical role in wildfire prevention and response to an actual fire event. Multiple state and federal agencies utilize system airports for use in firefighting operations. There are several permanent United States Forest Service fire bases located at system airports. These facilities provide training for firefighters, staging areas for fire response, and storage of equipment and aircraft. Those airports having such facilities are listed below:

- Burns Municipal Airport
- Grant County Regional / Ogilvie Field
- Joseph State Airport
- La Grande / Union County Airport
- McKenzie Bridge State Airport
- Rogue Valley International - Medford Airport
- Memaloose Airport (USFS)
- Oakridge State Airport
- Prineville Airport
- Redmond Municipal - Roberts Field
- Roseburg Regional Airport
- Silver Lake USFS Strip
- Eastern Oregon Regional Airport at Pendleton

Temporary use of other Oregon System Airports for purposes of firefighting occurs seasonally. The location of a wildfire and the response required to fight the fire typically determines the location of these temporary uses.

### **6.6.c Emergency Response**

In the event of a natural disaster or man-made emergency, aviation would be a critical response asset for the state and federal government to minimize loss of life and property. As previously mentioned, Oregon's population is concentrated in a limited number of areas and much of the state has limited road infrastructure. Therefore, the use of aircraft would likely provide critical support to ground operations in the event of an emergency. These aircraft would likely come from system airports located in close proximity to the emergency.

The Oregon Emergency Management (OEM), United States Department of Homeland Security (DHS), and Federal Emergency Management Agency (FEMA), have identified nine airports throughout Oregon for potential use as Commodities Distribution and Staging Areas. These nine airports would provide storage areas where supplies could be stored in the event of an emergency. In addition, office space would be made available in the event of an emergency to facilitate staging area operations. The nine airports identified are:

- Astoria Regional Airport
- Corvallis Municipal Airport
- Eastern Oregon Regional Airport at Pendleton
- Klamath Falls Airport
- Mahlon Sweet Field
- McNary Field
- Portland International Airport
- Portland Hillsboro Airport
- Rogue Valley International – Medford Airport

In addition to the nine airports listed above, the ODA has been working closely with the United States Department of Health and Human Services (DHHS) and their efforts to respond to a large scale disaster, such as an earthquake, tsunami or public health emergency. DHHS has identified Cape Blanco State Airport as a critical state resource in the event of an emergency. DHHS recommends ODA maintain ownership and maintenance of this facility, as it would be critical to ensuring a robust response and recovery effort in the event of an emergency on Oregon's southern coast.

#### **6.6.d Summary**

Local, state, and federal agencies depend on Oregon airports for health and medical response, wildfire prevention and response, and in the event of a regional or statewide emergency. It is critical that the aviation infrastructure be maintained for the continued protection of life and property throughout Oregon. ODA should continue to coordinate with other state and federal agencies to adequately plan for responses to each of these scenarios.

**Insert Figure 6.1**

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## 6.7 Military Operations Areas

A military operations area (MOA) is considered restricted airspace or prohibited airspace due to military operations that justify flight limitations on aircraft not participating in those operations. A MOA is a type of special use airspace (SUA) which identifies for other users areas where military activity occurs to ensure separation of the military operations with that of civilian fliers. The FAA maintains current schedules and contacts for the agency controlling the MOA.

MOA's are often located over rural or isolated areas to avoid noise concerns for people living near a MOA and for protection from potential aircraft accidents. A designated MOA will appear on the corresponding sectional charts and will provide the MOA's normal hours of operation, lower and upper altitudes or operation, controlling authority contact, and using agency.

Oregon has several active MOA's throughout the state. When the MOA's are active, aircraft should contact air traffic control for instructions on how to proceed through an active MOA and if the military activity prohibits direct routes, air traffic will provide an alternate route. To determine how this affects the efficiency and capacity of airspace within Oregon, a thorough capacity analysis should be completed.

## 6.8 Intrastate Shuttle

As part of the *OAP 2007*, the Project Team evaluated the preliminary feasibility of an intra-state shuttle program. The purpose of the shuttle would be to provide air transportation access to communities not already served by commercial air service. The shuttle program was not intended to provide a state-run airline service nor compete with commercial air service throughout the state.

The Project Team conducted a survey of Oregon businesses and communities to gauge their level of interest in the shuttle concept. The survey requested information regarding preferred destinations, departure and arrival times, frequency of flights, type of aircraft, and their willingness to contribute financially. Most communities indicated that the shuttle concept would provide economic benefits to their community. However, most communities were not interested in financial participation. Many business respondents indicated they would likely utilize the intra-state shuttle concept, but were also not likely to contribute financially.

Without financial contributions from business and community users, the shuttle concept is likely not feasible. The costs of operating and maintaining a fleet of aircraft, providing terminal amenities and hangars at various airports, and employing pilots and ground crews would be significant for the state to fund on an annual basis. Therefore, the Project Team, ODA, and the Advisory Committees determined the shuttle concept not feasible and terminated further study.

## 6.9 Divestment of State Owned Airports

The state of Oregon currently operates 27 airports throughout the state. These airports provide access to small communities, recreational opportunities, and serve as staging areas for firefighting, and many are recognized as emergency landing strips in remote regions of the state. ODA currently manages and maintains these airports.

State ownership requires a significant financial investment to maintain, improve, and manage these facilities. Divestment of state-owned airports should be considered when a community is willing and capable of maintaining a state-owned airport. This will reduce the financial responsibilities of the state and provide the community with a valuable resource that they can develop in a manner that best supports their needs.

## 6.10 National Plan of Integrated Airport Systems (NPIAS)

The National Plan of Integrated Airport Systems (NPIAS) is a published national plan for the development of public-use airports and is derived from a compilation of local, regional, and state planning studies. The national system of airports is designed to provide communities with access to safe and adequate airports. Only airports included in the NPIAS are eligible for federal funding through a program called the Airport Improvement Program (AIP). Inclusion in the NPIAS, along with the acceptance of funding from the FAA requires an airport sponsor to maintain the airport in a safe and effective manner for the flying public.

The NPIAS program has established minimum requirements airports must meet to be eligible for inclusion in the NPIAS. The following paragraphs outline the requirements for each category of airport.

The NPIAS should include substantially all airports with a significant amount of commercial service. To be entered in the NPIAS as a commercial service location, the airport or heliport must meet one of the following criteria:

- Public use airport with schedule passenger service which annually enplanes 2,500 or more paying passengers as determined by the FAA,
- Public use airport that is forecast by the FAA to receive scheduled passenger service with 2,500 or more annual enplanements within 10 years,
- Proposed new airport that is forecast by the FAA to receive scheduled passenger service with 2,500 or more enplanements within 10 years.

Airports that qualify only by forecasts are included in the planning time periods in which they will qualify. Inclusion of new primary airports must be reviewed and approved by the National Planning Division of the FAA.

Entry of general aviation reliever airports is based on two sets of qualifications: one for the reliever airport, and one for the airport being relieved. The NPIAS entry criteria for the reliever airport or heliport is that the facility either:

- Relieves airport congestion at a metropolitan commercial service airport by providing general aviation aircraft with an attractive alternative, or
- Has or will have a precision instrument landing system: i.e., instrument landing system (ILS) for training use by general aviation.

An airport relieving congestion should have a current forecast activity level of at least:

- 50 based aircraft or,
- 25,000 itinerant aircraft operations (12,500 if a heliport) or,
- 35,000 local operations (17,500 if a heliport)

Additionally, the commercial service airport being relieved must:

- Serve a standard metropolitan statistical area with a population of at least 250,000, or enplane 250,000 passengers annually, and
- Operate at 60% capacity, before or after being relieved, or have restricted activities which unrestricted would reach 60% capacity.

A reliever airport which does not meet the above criteria may still be included in the NPIAS only if it is so designated in a state, regional, or metropolitan plan and the FAA concurs.

Non-reliever general aviation airports may also be included in the NPIAS. Public use general aviation airports may be include in the NPIAS if:

- The facility is included in an FAA-accepted state or metropolitan system plan, is located at least 30 minutes ground travel time from the nearest NPIAS airport and:
  - If an existing facility, has at least 10 based aircraft,
  - If a proposed facility, is expected to have at least 10 based aircraft in the first year of its existence.
- The facility is included in an FAA-accepted state or metropolitan system plan, serves a community more than 30 minutes from the nearest NPIAS airport, is forecast to have 10 based aircraft within the next 5 years, and has an eligible sponsor who will manage and develop the facility.
- There is special justification showing that the facility is of national interest. Such justification include:
  - The facility is included in an FAA-accepted state or metropolitan system plan and has been subjected to a cost-benefit analysis which indicates the benefit outweighs the development costs,
  - The facility will serve or support an isolated community, a recreation area, a national resource area, or a Native American tribe.

- A unit of the National Guard or military reserve is permanently based or adjacent to the facility, and the unit operates permanently assigned aircraft in support of the unit's mission,
- The facility is a scheduled stop by an air carrier transporting U.S. mail and is adequate to serve the needs of the U.S. Postal Service,
- The facility was in the last published NPIAS and is subject to certain compliance obligations under Federal Aids to Airport Program (FAAP) grant or an Airport Development Aid Program (ADAP) grant. Do not include a facility that meets these conditions if it is no longer of national interest and not included in a state or metropolitan system plan.

A privately owned airport may be included in the NPIAS if it:

- Is open to the public,
- Is of national value; i.e., will serve a national system need,
- Has the potential for FAA site approval,
- Is financially feasible to develop the airport in accordance with FAA standards,
- Will, with development, meet forecasts of aviation demand.

### **6.11 Development of Signage Program**

The development of a signage program would greatly enhance the accessibility to Oregon airports. Many of the system airports are located in remote regions of the state but are in close proximity to a population center. Locating the airport can be difficult if you are unfamiliar with the area.

The *OAP 2007* recommends that a statewide airport signage program be considered for the purpose of improving access to and from community airports. The ODA should develop partnerships with *Travel Oregon*, local chambers of commerce, and the state economic development office to pursue this initiative.

### **6.12 Development of Airport Directory**

An airport directory is a resource for pilots using the airport system. The directory provides information about the airport facilities, capabilities, and radio frequencies. It is important to maintain a current directory with the most recent changes at all airports. The current edition of the Oregon Airport Directory was published in 2003. Since that time numerous airport improvement projects have taken place, airports have closed, and other system changes have occurred. Therefore, the *OAP 2007* recommends that a new airport directory be developed that reflects all changes to system airports.

### 6.13 Land Use Study

Essential to the growth and preservation of Oregon's state aviation system is the protection of system airports through land use planning. It is important to maintain an obstruction free airport and associated airspace. This includes the area that encompasses the airport, runway protection zones, approach areas, and general vicinity of the airport. While some of these areas are owned by airports, the bulk of the land beyond airport boundaries is privately owned and needs to be managed by the local municipality in which the airport jurisdiction falls. The primary tools available to local governments to prevent incompatible development are zoning and land use controls such as comprehensive plans, airport land use plans, and airport overlay zoning ordinances.

To assist local governments, the state of Oregon should participate in the development of these plans and zoning ordinances, and each community should consult the FAA Advisory Circulars (AC) to ensure that their individual airport meets current design criteria. Too often, local governments review and approve land uses and structures with little consideration as to how the land use or structure will affect airport operations. FAA criteria such as grant assurances and design guidelines, along with aviation accident statistics provide the foundation and the justification for compatible land uses.

Federal, state, and local resources have been invested to develop the airport infrastructure necessary to support aviation activity in Oregon. Protecting airports and their airspace through compatible land use planning will help maximize the return on investment on infrastructure, as well as maintain a safe operating environment. Land use compatibility is a requirement for eligibility to receive FAA grant funding airport improvements. Adjacent land uses that are not compatible with airports may result in the loss of federal or state funding for airports.

The *OAP 2007* recommends that a comprehensive land use study be conducted to identify non-compatible land uses adjacent to system airports and the development of a tool kit that will provide guidance to local governments.

### 6.14 State Warning Airports

ODA operates 27 airports; nine have been designated as warning airports. These airports do not meet normal dimensional standards and have conditions that require specific pilot knowledge. They require special techniques and procedures to use safely and may not be usable by many aircraft under normal conditions. The nine warning airports are:

- Cascade Locks State Airport
- Crescent Lake State Airport
- McKenzie Bridge State Airport
- Owyhee Reservoir State Airport
- Pacific City State Airport
- Pinehurst State Airport
- Santiam Junction State Airport
- Toledo State Airport
- Wakonda Beach State Airport

The following sections provide a detailed review of each warning airport.

#### **6.14.a Cascade Locks State Airport**

Cascade Locks State Airport is little used but is an important emergency strip, centrally located in the scenic Columbia Gorge. Many pilots flying through the Gorge in marginal weather and unable to continue with the visual flight rule have been very grateful to have access to this airport. It has even successfully accommodated several forced landings.

Cascade Locks is a warning airport because the runway is only 1,800 feet long and 30 feet wide. The approach on the west end is clear and is over the Columbia River. The terrain drops off rapidly to the west, so trees are not a concern. The approach from the east is obstructed by many large trees, and a steep approach is required to land to the west. There is also a road, fence, and brush 180 feet from the east runway end.

The traffic pattern for Runway 24 is right traffic. Both patterns are to the north, over the river to avoid the mountains to the south. Winds are frequently very strong in the Gorge, and significant turbulence can be expected. The runway is surrounded by trees, so crosswinds can produce extreme low-level turbulence and unexpected wind currents.

The turf tie-down area is centrally located on the south side of the runway, but is not well defined. Use caution when taxiing, as it can be difficult to see the tie-downs if the grass has not been mowed recently.

#### **6.14.b Crescent Lake State Airport**

Crescent Lake State Airport is another airport with limited use but serves as an important emergency/recreational airport. The runway appears to be ample in length at 3,900 feet, but the airport elevation is 4,810 feet. In summer, density altitudes are frequently 7,000 feet and can exceed 8,000 feet.

The threshold of Runway 31 is displaced 300 feet because of the road and 55-foot trees at the end of the runway. This is a considerably shorter distance than the displacement needed to allow standard approach clearance, so a steep approach angle is necessary. The approach to Runway 13 has 15-foot trees only 290 feet from the end. The runway also has a slight slope (1.5 percent) up to the northwest. It is not particularly noticeable, but it could be a factor for some aircraft.

The airport receives no winter maintenance, so is closed due to snow as early as October. The high elevation can lead to some prolonged winters. The airport normally reopens in May or June.

#### **6.14.c McKenzie Bridge State Airport**

McKenzie Bridge State Airport is about 43 miles east of Eugene in the Cascade foothills and lies just south of Highway 126. At 2,600 feet long and 90 feet wide, the airport is not particularly short or narrow for the elevation, but it is surrounded by trees and the runway surface slopes up to the east at about 3.4%. Because of the slope and the higher terrain and trees on the east end, the runway is used in a single direction. Landings should not be attempted to the west, nor should takeoffs be attempted to the east. The approach area on the west end has been cleared back for 100 feet, but the trees there are more than 120 feet tall.

The runway is turf and is normally in good condition. It can be soft in the winter, and elk can make the surface rough. The west end has less slope than the east third of the runway. The runway is surrounded by 100-foot trees that generate significant turbulence and downdrafts can be expected under strong crosswind conditions. Afternoon winds are often strong out of the west. Landing under such conditions is not recommended. There is also a +500-foot ridgeline about 1,000 feet south of the runway and parallel to it. The possibility of extreme turbulence under south wind conditions is very likely.

#### **6.14.d Owyhee Reservoir State Airport**

Owyhee Reservoir State Airport is Oregon's one true "back country airport". Located 45 miles south of Ontario and 16 miles west of the Idaho state line, it is unique in Oregon's airport system. It serves no community and has minimal emergency value, but it does offer great recreational opportunities if you have the right combination of aircraft type and pilot skills.

No ground access exists to this airport. It is about 1.5 hours by boat from Lake Owyhee State Park on the north end of the reservoir to the airport. The airport is located in an area, which is known as "Pelican Point" for the peninsula on which it lies. It can be a very lonely place most of the time, but on a busy holiday weekend, ten or more aircraft may be found there.

The Owyhee runway has a dirt surface, measuring only 1,840 feet long and 30 feet wide and is at an elevation of 2,680 feet MSL. It lies across the peninsula and normally the reservoir water comes right up to the ends. There are no obstructions, so it is easy to land on the end of the runway. There are often many loose rocks on the surface, and it can be a bit rough. The surface can also be soft after a rain. The airport is in the bottom of the reservoir gorge with much higher terrain on all sides; consequently, turbulence can be extreme if the winds are strong.

#### **6.14.e Pacific City State Airport**

Pacific City State Airport is a popular coastal destination. It is only a short walk to the beach (Bob Straub State Park), Cape Kawanda is located about one mile north. Unfortunately, this airport has had a number of accidents. The runway is only 1,875 feet long, and the north end has a 300-

foot displaced threshold to allow a reasonable approach clearance slope over the road at the end. This leaves 1,575 feet of runway available for landing to the south.

Normally the winds are strong in the afternoons, which helps compensate for the short runway length. The runway is only 30 feet wide, which makes the runway look deceptively long. Obstructions along the sides of the runway are close, creating low-level turbulence during crosswind conditions. Strong crosswinds can make landings treacherous. On the south end the approach is over the sand dunes and Nestucca Bay, so there are no significant obstructions. At the north end of the airport, there is a three-inch cable fence across the end of the runway and a city street beyond that. A small building sits on the north side of the road, 120 feet from the runway end. North of that building are a number of trees and a 40-foot power line situated 500 feet from the runway end. It is preferable to land to the north during calm wind conditions.

Another unique feature of Pacific City is that on occasion the runway is underwater. This normally happens during extreme high tides or during a winter storm surge when the river is already high. These high tides can leave trash and logs on the runway after they subside. Due to proximity to the water, the unpaved surfaces are often very soft. Taxiing off the pavement without first walking the area is discouraged.

#### **6.14.f Pinehurst State Airport**

Pinehurst State Airport is another low-use airport that has significant emergency value. It is located in the southern Cascade Range between Ashland and Klamath Falls. The airport is often clear when Ashland and Medford experience operational limitations due to fog.

The paved 2,800-foot-long and 30-foot-wide runway is at an elevation of 3,650 feet MSL. The runway was overlaid in recent years, and the tie-down area was paved. The first half of the runway is fairly level, but it then slopes up abruptly at about a four percent (4%) grade. The airport is surrounded by trees, but the approaches are cleared for over 1,200 feet on each end. The trees to the northeast are approximately 50 feet tall and the trees to the southwest are about 80 feet tall. Because of the taller trees to the southwest and the slope of the runway, caution should be exercised when landing to the northeast. Strong winds here from almost any direction will cause low-level turbulence. Regular winter maintenance is not scheduled, but local pilots do try to keep the airport open. After the first snowfall, it is important to assess the conditions prior to use.

#### **6.14.g Santiam Junction State Airport**

Santiam Junction State Airport is a seldom-used emergency/recreational airport, located just west of Santiam Pass near the junction of Highways 22 and 20, adjacent to a highway maintenance station. The cinder runway is normally firm and smooth. Fly-in camping is permitted on the south side of the runway. No services or facilities are available and the strip receives no winter maintenance, therefore it is closed after the first snowfall until spring.

The runway is a 2,800 feet long and 150 feet wide and is nearly 500 feet short of the standard for its 3,780-foot elevation. The runway is surrounded by high terrain and trees; consequently, turbulence should be expected when the winds are strong. The runway slopes up to the east at nearly a 1.5 percent (1.5 %) grade. High terrain and +200-foot trees on the east end prevent takeoffs to the east and landings to the west, essentially creating a single-direction runway. The approach from the west is between two cinder cones, but the obstructions on centerline are minimal.

This airport is often used as a firebase in the summer, so there may be several helicopters operating from the strip.

#### **6.141.h Toledo State Airport**

Toledo State Airport serves as both a community access airport and an emergency airport. It is located about six miles east of Newport on the Yaquina River. Pilots flying to Newport or Siletz Bay will often find Toledo is clear, when the airports on the coast are fogged in. The airport is unlighted and has no services, but there is a phone adjacent to the ramp.

At 1,750 feet in length and 40 feet in width, the airport is both shorter and narrower than standard. The runway is paved, but it is rough and there may be some loose gravel on the surface. There is a 3- to 4-inch drop from the pavement to the shoulders in some places. In addition to being short, the runway is surrounded by higher terrain. Both approaches have significant obstructions. To the southeast, Runway 31 has 80-foot trees about 400 feet from the runway end, and numerous other trees and high terrain farther out. A slightly curved approach over the river to the west helps avoid the worst of the obstructions.

To the northwest, Runway 13 has 120-foot trees about 1,500 feet from the runway. Again, a curved approach from over the river will help miss the majority of the approach obstructions. There are many deer around the airport, caution is recommended.

#### **6.14.i Wakonda Beach State Airport**

Wakonda Beach State Airport is an emergency/recreational airport, located on the east side of Highway 101 about two miles south of Waldport. It is less than a quarter mile walk to the beach, and Beachside State Park is just west of the highway across from the south end of the runway.

The runway is a 2,000-foot-long and 50-foot-wide turf strip. The runway can be soft in the winter after extensive rains, but is normally in good condition and therefore usable year-round. Some wind erosion has occurred along the shoulders. There is a line of 60- to 75-foot-tall trees down the east side of the runway that are only 75 feet from the centerline. The west side is brushy and more open, but low-level turbulence should be expected under crosswind conditions. There have

been reports of a downdraft off the north end under strong north-wind conditions. Takeoffs to the north should be done with caution.

Both approaches have significant obstructions. The north-end obstructions include a road, some lower trees, and a telephone line run through the approach on this end. When conditions permit, landings can be made to the north and takeoffs can be made to the south. The terrain to the south rises slowly for over 1,000 feet. There are also a few tall trees on the east side of the extended centerline of Runway 34. A slightly curved approach from the west helps to avoid the obstructions on this end.