Washington State Department of Transportation

Washington State Long-Term Air Transportation Study

Phase I Draft Technical Report

Airport System Facility and Capacity Assessment

September 30, 2006

Draft Report

The following statement is provided as required by Paragraph 429.a of Federal Aviation Administration Order 5100.38, Airport Improvement Program (AIP) Handbook:

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EXECUTIVE SUMMARY

Study Overview

In 2005 the Washington State legislature initiated the Long-Term Air Transportation Study (LATS). The study began in response to the growing recognition that Washington's network of 140 public use airports needs to be managed as an integrated system, to more strategically invest the public resources necessary to preserve future aviation capacity.

Through LATS the legislature required the Washington State Department of Transportation (WSDOT) to assess existing capacity and implement a state aviation plan to determine long-term air transportation needs.

LATS is being developed in three phases, with this report representing the first phase of the effort. Each phase answers one of the three basic questions fundamental to the development of a systemwide approach to managing Washington's aviation resource:

- **Phase I – (What do we have?)** – This phase inventories statewide airport facilities and capacity.
- **Phase II – (What do we need?)** – Phase II will provide a market forecast of statewide airport capacity and facilities. It will also include an analysis of air cargo and integrate the findings of Washington's high-speed passenger rail study.
- **Phase III – (How will we get there?)** – During this policy development phase, the Governor's Airport Planning Council will consider the LATS findings and public input to make recommendations on how to best meet the state's long term commercial and general aviation needs.

What is Included in the Phase I Report?

This document presents the findings of Phase I of this effort. It provides a snapshot of current airport facilities in Washington State, summarizing statewide airport facilities and services information and measuring current airport system capacity. This phase addresses existing conditions only. The results and data collection from Phase I will be used in Phase II as part of the forecasting analysis.

Work on Phase I spanned a timeframe of four and a half months and included a statewide airport inventory survey. The airport inventory

survey updated WSDOT's 2003 system plan effort, and expanded the information gathering significantly. In addition to including the commercial service airports, the survey included a number of new elements to provide a comprehensive overview of the physical inventory of the airport system. In addition to the survey, master plans were checked and phone calls made to gather data for the airport facility and capacity assessment.

The report provides an overview of LATS, explains the methodology used to assess airports, introduces the state classification system, presents the assessment results, summarizes the key findings, and outlines next steps.

How Was Capacity Assessed?

The airport capacity analysis estimated the total capacity at each airport based upon existing facilities and infrastructure including runways, taxiways, terminals, aprons, and aircraft parking. Current capacity utilization was also measured based on a number of key industry metrics such as total activity levels, operations, passengers, based aircraft, cargo volumes/tons and where feasible, undeveloped land. The methodology used recommended FAA guidelines for measuring airport capacity.

Airport capacity was assessed for each individual airport level, by four Special Emphasis Regions that have experienced high population and aviation growth in the state, by regional transportation organizations and statewide. Additionally, the airports were grouped according to both the FAA National Plan of Integrated Airports System (NPIAS) classification and the newly proposed state classifications. The state classifications were recently developed and proposed within the last year and WSDOT plans to refine and finalize these classifications during the course of LATS.

In addition to providing a profile of Washington State airports, the airport capacity assessment establishes a baseline of the current system capacity levels and activity. This measure of baseline activity within an airport system is an essential tool used to identify existing and evolving roles, understand how airports serve their respective markets, assess overall capacity distribution, highlight deficiencies within the system and evaluate other characteristics that profile the overall airport system. These data become the basis for future development and investment decisions.

In the Phase I assessment, airports were classified in accordance with a newly developed state classification system. A baseline of various proposed performance criteria was compared against each airport class to evaluate existing conditions. Among the state airport classifications, each

considers slightly different performance criteria as appropriate to each respective airport group.

Summary of Key Findings

The major findings of the airport capacity assessment are detailed in Part 4 of the Phase I Report. Listed below are some of the major capacity findings:

Passenger Capacity

- With respect to passenger terminals at peak hour, only Seattle-Tacoma International Airport (Sea-Tac) and Tri Cities have been found to exceed the 60 percent threshold for utilization that the FAA identifies as the point that an airport should begin planning for new facilities.

- Due to increases in daily service by larger jets (130-150 seat MD83/87's) at Bellingham in early 2006, this airport facility has also begun to experience peak hour capacity constraints not reflective as dramatically in the 2005 airport inventory survey data.

Cargo Capacity

- Cargo capacity at Washington State airports is highly underutilized with the exception of Sea-Tac and Boeing Field/King County International, experiencing utilization levels of 80 percent and 60 percent respectively.

Reserve Capacity

- The busiest airports in Washington with the least reserve capacity total six and include three commercial service, (Boeing Field, Kenmore Air Harbor and Sea-Tac) two regional (Auburn and Harvey), and one seaplane base (Kenmore Air Harbor/Lake Union) facility.

General Aviation Parking and Storage

- General aviation aircraft parking and hangar storage for all Washington airports has reached 85 percent of existing capacity statewide. However, several airports are close to reaching their maximum utilization levels.

- Hangars are more desirable than aircraft tie downs for storage. In many instances, tie downs are available but hangar wait lists have

become prevalent across the state. Approximately 650 individuals are waiting for an aircraft hangar facility.

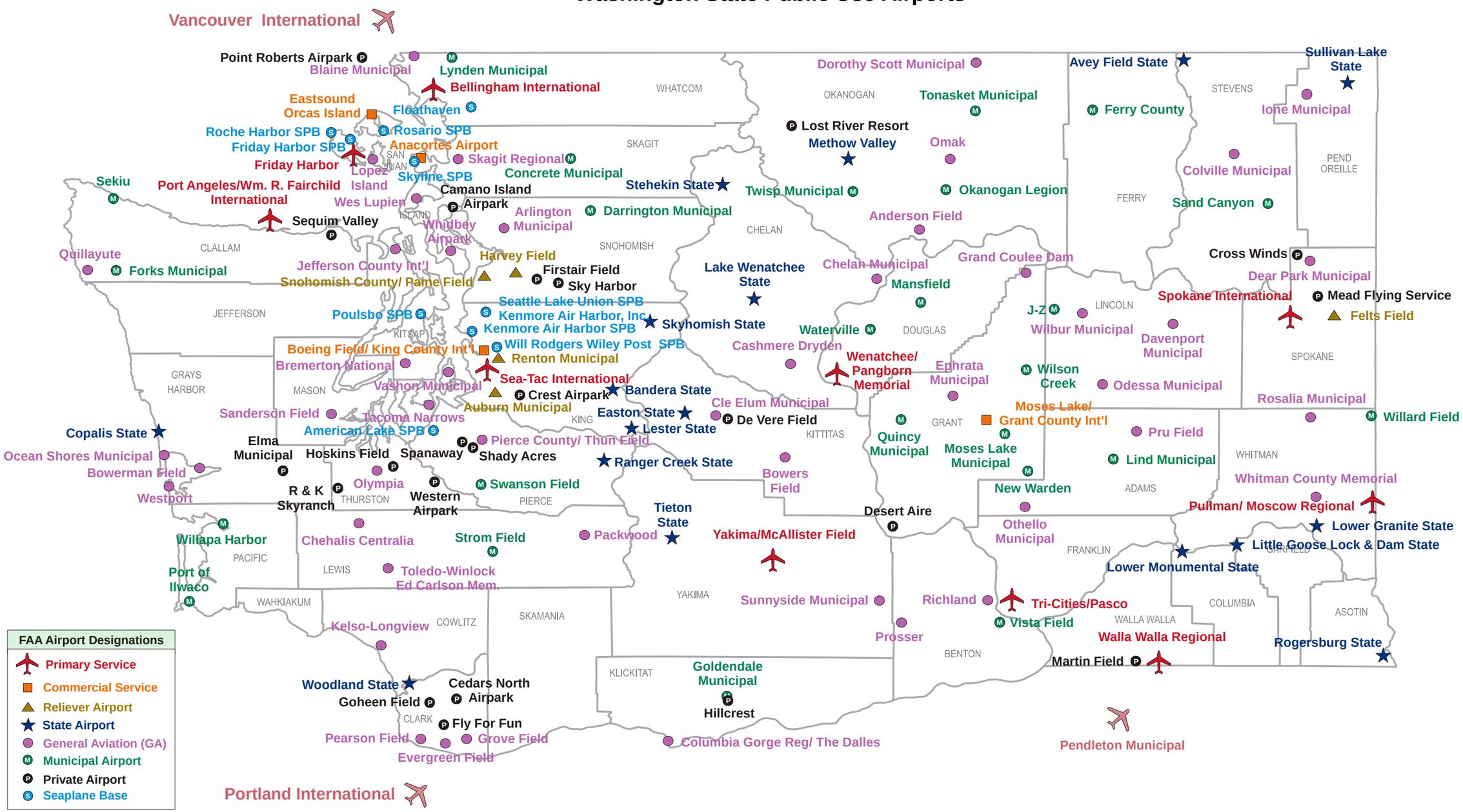
Undeveloped Land Inventory

- Airports with the largest amount of undeveloped land include: Bremerton National, Arlington, Spokane International, Deer Park, and Richland airports. It is important to note that a total 82 airports did not provide any data in the undeveloped land inventory survey, therefore, the reported acreage available for future development could be more than currently stated in the study.

Next Steps

Several of the Phase II work elements have begun during Phase I and will continue over the next ten months. The analysis will help identify which airports will meet, exceed or fall short of adequately serving the anticipated future demand. The findings of Phase II will summarize the estimated future capacity and projected market demand as well as preliminary systems alternatives, which will be incorporated into a technical report for presentation to the Governor's Airport Planning Council. Phase III will determine final recommendations of future airport development in Washington.

Washington State Public Use Airports



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PART 1: INTRODUCTION

Why Study Washington's Aviation System?

Airports function as both valuable transportation assets and economic engines. They are crucial on a local, statewide, and national level to move people and goods, promote business and commerce and contribute to our quality of life. Airports also provide access for critical services such as emergency medical, search and rescue, firefighting, and disaster management activities that other transportation modes could not adequately accommodate. The fact that Washington's airports are an essential component of Washington's overall transportation system has been clearly emphasized in the Governor's strategic economic plan and the
Washington State Legislature's 2005 call for this Long-Term Air Transportation Study (LATS).

This Phase I technical report details the current capacity and overall conditions of the state's airports. It serves as the first step towards developing a comprehensive improvement strategy for Washington's aviation system. LATS will help the governor and state legislature to make decisions and target investments that effectively serve the future air transportation needs of Washington.

What is the State's Interest in Aviation?

In 1996, the Washington State Transportation Commission convened a group of aviation stakeholders as the Aviation Policy Advisory Committee to identify aviation issues, and to make recommendations to the Transportation Commission on an appropriate, expanded state role in aviation. The group defined the following as the state's interest in aviation:

Preservation: It is the state's interest that aviation facilities and services be preserved to provide access for all regions of the state to the nation's air transportation system, provide for emergency management, and support local economies.

Safety: It is the state's interest that transportation by air be safe.

Capacity: It is the state's interest that there be sufficient airport capacity to respond to growth in demand and ensure access across the state, the nation and the world.

Environmental Protection: It is the state's interest that negative environmental impacts of airports on people and the natural environment be mitigated.

What are the Issues?

Over 17 million scheduled passengers enplane at a Washington airport, 3.7 million aircraft land or depart and more than 860,000 tons of air cargo flow through the state's airports. More and more pilots continue to depend on the state's public use airports for transportation, recreation and emergency uses.

Washington's aviation system is highly dynamic, but in spite of its importance to the state's economy, the combined forces of benign neglect, inconsistent levels of activity, an antiquated funding base, a fluctuating economy and local land use conflicts—interact to threaten its very existence.

Several factors underscore the urgency for long range aviation planning in Washington:

- At a state level, significant population growth is expected: Washington population has doubled in the last 30 years, and an additional two million are expected by 2025. Significant growth is also expected in four regions of the state:
    - Spokane Area: 200,000 increase
    - Tri-Cities Area: 100,000 increase
    - Puget Sound: 1 million increase
    - SW Washington: 400,000 increase
- Historically, increases in population result in increased aviation activity for business, freight, emergency access, public safety and recreation.
- FAA predicts significant increases within the state including a 25 percent increase in total aviation activity and a 42 percent increase in commercial operations by 2025.
- FAA predicts significant changes will include commercial service activity transitioning to smaller next generation aircraft. Growth in general aviation is predicted to increase, with business and corporate flying anticipated to grow by 60 percent in 2030. FAA forecasts the

fleet of very light jets and next generation technology aircraft to increase nationwide by 400 to 500 each year through 2017.

- In spite of this high level of growth, and a growing need for capacity, aviation funding remains in question due to unstable fuel prices and proposed federal funding cuts. The ever decreasing resources for airports continue to demand a focused, planned decision making process.

With significant change expected in coming years, the state must be prepared to face the challenge of maintaining and improving our aviation system for the future. Washington needs a coherent statewide strategy to ensure that adequate aviation capacity exists to accommodate predicted growth.

In recognition of this need, the Washington State Legislature initiated in 2005 a Long-Term Air Transportation Study (LATS). Armed with the solid information generated by LATS, both Washington State and the Federal Aviation Administration (FAA) will be better equipped to make more cost effective decisions about airport development proposals. The study will also be helpful for future, more detailed master planning, and environmental analyses or site selection studies that might be conducted if proposals emerge for new or expanded airport facilities.

A Phased Study

This report presents the first of a three-phase of LATS. Each phase answers one of the three basic questions fundamental to the development of a systemwide approach to managing Washington's aviation resource:

- **Phase I – (What do we have?)** – This phase inventories statewide airport facilities and capacity.
- **Phase II – (What do we need?)** – Phase II will provide a market forecast of statewide airport capacity and facilities. It will also include an analysis of air cargo and integrate the findings of Washington's high-speed passenger rail study.

- **Phase III – (How will we get there?)** – During this policy development phase, the Governor's Airport Planning Council appointed by the Governor will consider the LATS findings and public input to make recommendations on how to best meet the state's long term commercial and general aviation needs.

LATS will address capacity needs for the overall system, but does not include more detailed efforts of an airport master plan, environmental assessment, or site selection for new airport facilities. Those decisions require much more detailed analysis and information and would be performed as part of a separate effort with extensive involvement from local jurisdictions and the public.

Figure 1: LATS Study Phases

PHASE I	WHAT WE HAVE	Airport inventory, capacity and airspace assessment.	To be completed by September 30, 2006
PHASE II	WHAT WE NEED	25 year activity forecast (139 airports), market analyses at commercial service airports, air cargo forecast, high speed passenger rail assessment; future capacity analysis, summarize system requirement.	To be completed by July 2007
PHASE III	HOW WE MEET THE NEEDS	The Governor's Airport Planning Council to provide recommendations for future airport strategy and investment statewide.	To be completed by July 2009

Building on Previous Efforts

LATS draws from regional and statewide airport studies and other resources dating back to the late 1980's. These include:

- AIRTRAC (1990) Air Transportation Commission created to strategically integrate air and surface transportation
- PSRC Flight Plan (1992) to Build 3rd runway at Sea-Tac and develop major supplemental airports – Paine Field eliminated as preferred alternative
- Washington Transportation Commission – Resolution 477 (1993)
- Aviation Goals and Policy Plan (1998)

- State wide Airport Economic Impact Study (2001)
- Rural Airport Study (2002)
- Pavement Condition Assessment (2006 Final Draft)
- Airport Layout Plans (2005-2007) are now required for WSDOT Airport Aid Grant Program eligibility. More than 30 will be completed by 2007

What Does the State Aviation System Look Like?

LATS addresses 140 airports that were open for public use in 2005. Of these, nearly half (65) are deemed significant to the national airport system. These airports of significance are planned for and integrated into the FAA's National Plan of Integrated Airports (NPIAS) every two years. Evergreen Field, located in Clark County, is listed, although it closed in July 2006. Lester State, located in King County, is also listed, although it is closed to fixed wing aircraft traffic since flooding destroyed the runway.

The state airport map included on Page 5 shows how the public use airports are distributed across the state.

What Specifically is Addressed in LATS Phase I?

The Phase I assessment includes a statewide analysis of existing airport facilities, and commercial passenger, air cargo and general aviation transportation capacity. However, the primary focus of this assessment is on commercial aviation. This phase addresses existing conditions only – forecasting will be performed as part of the Phase II analysis. The Phase I report provides a snapshot of current airport facilities in Washington State.

The results summarize statewide airport facilities and services information and measure current airport system capacity. The Phase I report also introduces state airport classifications that help define the role of each airport in meeting air transportation needs and how it functions as part of the statewide system.

What you will find in this report:

- **Approach:** This section presents the study objectives set by the two funding partners – the Washington State Legislature and Federal Aviation Administration – and identifies the audiences and geographies addressed in the report.

- **Methodology:** This section describes the techniques used to design the study, communicate with the public, and collect data.

- **Assessment:** Findings in this section describe existing facilities and services available at Washington's airports and assess existing airport capacity. The system assessment is organized in three sections, including statewide analysis, Special Emphasis Regions and Regional Transportation Planning Organizations (RTPO). (Data reports for individual airports are available on the WSDOT Web site or by request.)

- **Next Steps:** This section describes upcoming system plan work to be conducted during Phase II and Phase III.

- **Summary of Findings:** Highlights the major findings of Phase I.

PART 2: HOW DID WE ASSESS WASHINGTON'S AVIATION SYSTEM?

As a state system plan, LATS is designed to meet the planning objectives of transportation bill 5121 developed by the Washington State Legislature in 2005 and the Federal Aviation Administration's Advisory Circular 150/5070-7, The Airport System Planning Process. Ultimately, the purpose of LATS is to describe what we have, identify what we need, and develop a strategy for meeting Washington State's long term aviation needs. LATS is also taking into account the direction set by the legislature, and the input received from its numerous stakeholders including system users, airport sponsors, local governments, and regional planning agencies. Phase I is to collect and analyze data and assess existing airport facilities for use during subsequent phases of LATS. Study findings are presented at a range of geographic levels and organized by state and federal classification systems to serve these various purposes.

Who is this Report Written for?

Washington State Legislature

The specific intent of the legislature is described in Washington State transportation bill ESSB 5121. The bill requires WSDOT Aviation to conduct an airport capacity/facility assessment in Phase I and a demand/market analysis in Phase II. In the final phase, the governor will appoint an Aviation Planning Council. The Governor's Airport Planning Council will review the data and make recommendations to the governor, Legislature, Transportation Commission, and Regional Transportation Planning Organizations (RTPO) on how to best meet statewide commercial and general aviation capacity needs. The requirements of the bill are described below:

- Include a statewide analysis of existing airport facilities, and passenger and air cargo transportation capacity. The study must address both commercial and general aviation; however, the primary focus of the assessment must be on commercial aviation.

- Include a statewide needs analysis of airport facilities, passenger and air cargo transportation capacity, and forecast market demand needs over the next 25 years with a more detailed analysis of the Puget Sound, southwest Washington, Spokane, and Tri-Cities regions. The analysis must address the forecasted needs of both commercial

aviation and general aviation; however, the primary focus of the analysis must be on commercial aviation.

- Review and evaluate high-speed passenger transportation facilities and services including rail or magnetic levitation transportation systems, to connect airports as a means to more efficiently utilize airport capacity, as well as to connect major population and activity centers.

Federal Aviation Administration

The National Plan of Integrated Airport Systems (NPIAS) and the Advisory Circular 150/5070-7, The Airport System Planning Process, presents the FAA's guidance for conducting statewide aviation system planning. Airport state system plan results are incorporated into the NPIAS, which is a national plan updated every two years and identifies each states specific airport improvements that will contribute to the achievement of FAA's goals. NPIAS supports the FAA's strategic goals for safety, system efficiency, and environmental compatibility. Aviation system planning fits between the FAA's national planning effort, as documented in the NPIAS, and the more comprehensive master plans prepared for individual airports.

WSDOT and its Planning Partners

While the legislature and FAA are the primary audiences for the study, LATS is expected to inform, and is informed by, a variety of other stakeholders including system users, airport sponsors, local governments, regional transportation planning agencies and other state agencies. In order to provide maximum benefit for these other groups, LATS is also designed to fit into Washington State's planning framework. This process emphasizes cooperative planning that involves the public and agencies at the local, regional, state and federal levels. Examples of planning efforts conducted at these levels include:

- Airport Master Plans and Airport Layout Plans
- Local Comprehensive Plans
- Regional Transportation Plans
- The Washington Transportation Plan (WTP)
- The National Plan of Integrated Airport Systems (NPIAS)

General Public

WSDOT is committed to consistent interaction with the public in order to inform, educate and engage people on the study's purpose and progress. Citizens of Washington State are interested in LATS because the recommendations made as a result of this study could affect their future transportation system, state economy and quality of life. WSDOT knows that outreach to the general public will be extremely vital to the study's success. Specifically, in Phase III, ESSB 5121 states that the Governor's Airport Planning Council will use public input when making recommendations about the state aviation system. It remains important that the public stay involved in all phases of LATS in order to make well-informed recommendations to the Governor's Airport Planning Council in Phase III.

How is the Public Involved?

WSDOT and the Legislature believe it is critical to solicit feedback and share results of this important statewide airport study in a transparent and comprehensive way.

The public outreach efforts for LATS started early with a communication plan, which was drafted in February 2006 and submitted to the public for a 10-day comment period. The final version of the communication plan is currently posted on the LATS Web page and provided in the Appendix. The plan serves as the overall guidance and strategy for engaging the public throughout the study. Key outreach goals include maintaining an updated and comprehensive LATS Web page, distributing press releases through the WSDOT Aviation email list, leveraging existing aviation associations, hosting regional meetings, publishing quarterly newsletters and soliciting feedback through stakeholder interviews and an online survey.

WSDOT's dedicated LATS Web page offers the public a central location for pertinent information relating to the study. The Web page continues to evolve as news, reports and information about LATS become available. From the Web page, the public can sign up to receive WSDOT email alerts about LATS. WSDOT's email list currently has over 6,000 subscribers and is comprised of aviation interests including general aviation and commercial pilots, airport sponsors, local jurisdictions, aviation planners, legislators, etc.

To reach as many aviation user and interested parties as possible; during Phase I, WSDOT reached out to many aviation associations, planning associations, the Transportation Commission, and other key stakeholder groups. These groups have their own publications, distribution lists,

conferences and meetings that WSDOT accessed to educate people about LATS. WSDOT will continue to work with these stakeholders to help disseminate the findings, efforts and progress throughout this study.

LATS outreach also includes a number of regional meetings to provide local stakeholders and members of the public with opportunities to obtain information about LATS. The first set of four regional meetings occurred in June 2006 in Seattle, Spokane, Moses Lake, and Chehalis. These meetings primarily targeted airport managers, although the public was also invited to attend. The second set of four regional meetings will provide an overview of findings for the Phase I results and is scheduled for early November 2006. Regional meetings provide a forum for interfacing with a number of stakeholders and convey the statewide significance of LATS.

The LATS team also launched a quarterly newsletter in June 2006 to introduce the study, announce the regional meetings, and provide additional opportunities for feedback. Available on the LATS Web site and in print, the newsletter highlights LATS' efforts including technical tasks and outreach activities. In addition to being distributed electronically to the WSDOT email list of over 6,000 registered stakeholders, legislative staff, airport managers and transportation associations received copies of the newsletter.

In July and August 2006 the project team conducted: approximately 35 stakeholders interviews and an online survey of 6,000 registered email subscribers of WSDOT's aviation news service. Stakeholder interviews included airport managers, state legislators, cargo and passenger commercial airlines, general aviation (GA) representatives, and other key constituents involved in economic development, aviation advocacy and cities located in areas with general aviation and/or commercial airports. The LATS Stakeholder Interview summary is available on the Web page and hard copies are available upon request.

In August 2006, over 500 stakeholders responded to a more general online survey distributed through WSDOT Aviations 6000 person data base. It-gauged stakeholders' level of awareness about LATS, as well as how effective the outreach efforts have been to date. The summary of responses is available on the LATS Web page and upon request by WSDSOT.

Both the stakeholder interviews and surveys show that a level of awareness has been created within the first few months of LATS. It was revealed that most people prefer to receive LATS information through email or via the Web site. It is the goal of LATS outreach efforts to monitor public awareness and continue to strengthen the public's understanding of LATS.

On September 30, 2006, Phase I findings will be posted on the LATS Web site for public and agency review. Throughout LATS, information will be continual posted to the Web site and distributed upon request so as to keep the public informed of findings and results.

What was the Data Collection Methodology?

Inventory Process/Database Update

As part of previous aviation planning projects, WSDOT Aviation conducted data collection efforts in 1997 at 129 airports, and then updated the information in 2003. The data collected in 2003 did not include commercial service airports. An additional 11 airports were identified and added to the database in 2005, since information was available through the FAA's Airport Master Record Data (5010) forms. The data collection included the following techniques:

- airport data search
- airport site visits
- airport management interviews
- physical facility inventories
- evaluation of existing operational activity
- WSDOT/FAA design standard compliance
- runway safety area inspections
- estimates of future operational activities
- multi-modal connection information
- identification of approach surface obstructions
- preparation of development needs lists
- pavement condition surveys
- preparation of an airport data condition assessment compendium

The resulting database provides information about facilities, services, and operations at 140 public-use airports. As part of the technical work effort outlined in the scope of work for LATS, Phase I, an online airport inventory survey was conducted to update the existing database. New material was also collected for the analysis of system capacity and future growth potential.

An online, web-based survey was developed to collect new and updated airport inventory information. Paper copies were distributed to individuals without the ability to access the web application. Airport sponsors received correspondence requesting their participation in the survey, and follow-up emails and phone calls were made through the summer. Upon completion of the surveys by each airport sponsor, the consultant team reviewed the surveys and provided follow-up phone calls to individual sponsors to clarify responses and verify the accuracy of submitted information.

Review of Existing Reports and Studies

Data gathered from the airport surveys were supplemented with information from airport master plans, airport layout plans, other planning documentation, aviation Web sites, and FAA reports and Master Record Data (5010) forms to provide the most updated information possible to complete the analysis. Another round of phone calls to airport sponsors was conducted to verify any discrepancies between the surveys and the supplemental documents.

How Does LATS Evaluate the Performance of the Aviation System?

Geographic Areas

The airports in Washington State are each part of a public transportation system that not only serves their immediate communities but are also contribute to the aviation network for both their regions and the state as a whole. Consequently, Phase I findings are presented from four perspectives: statewide, Special Emphasis Regions, Regional Transportation Planning Organizations, and individual airports. These geographic areas are described in more detail in Part 3.

Airport Classification Systems

Just as interstate highways serve a different purpose than arterials and local streets, different airports are designed to serve different air transportation needs. Airport classification systems are used to identify the role of each airport in the state system, and to understand the types of facilities and services necessary at each. The FAA has a classification system for the 65 Washington airports included in the national system, and the state has developed a similar classification system to address all 140 airports. The classification systems are described in more detail in the Technical Appendix Section of this report.

How Will Revisions to the Phase I Report Be Evaluated?

The purpose of Phase I was to collect data about the state's aviation system and describe existing facilities, services, activities and capacity. The Phase I report also presents a draft state classification system and associated minimum criteria and performance objectives. The data and findings presented in this report will set the framework for research conducted in Phase II. It is not the intent of LATS to draw conclusions about system needs – that task is the purview of the Governor's Airport Planning Council in Phase III.

The release of the Phase I report on September 30, 2006 is the first opportunity for public review. While the data and findings presented in the report have been thoroughly researched and reviewed, WSDOT anticipates that minor revisions may be appropriate to improve the accuracy of certain items. The state classifications, minimum criteria and performance objectives will be evaluated and revised based on public comment and further analysis. A full set of technical documents covering the research items from Phases I and II will be released as a final technical report in July 2007.

Public comment is welcome and encouraged at any time during the three-year, three-phase LATS study. Comments on the initial Phase I report will be recorded and available as part of the final technical report. Individual comments will be addressed as follows:

1. **Factual errors:** Public comments that identify factual errors in the report will be recorded and investigated before data and findings are updated in the report. The response to each comment will be recorded in the appendix to the July 2007 report.

2. **Conclusions:** Public comments that draw conclusions from the data, suggest outcomes, or voice support or opposition to policy options will

be recorded in the appendix to the July 2007 report and reserved for consideration by the Governor's Airport Planning Council in Phase III.

3. **State classifications, minimum criteria and performance objectives:** Comments related to the interpretation of criteria used to place airports in each classification and set performance objectives for each classification will be recorded, investigated, and considered as part of the evaluation in Phase II. Comments related to the impact of the classification system and performance objectives on individual airports will be recorded in the appendix to the July 2007 report and reserved for consideration by the Governor's Airport Planning Council in Phase III.

PART 3: HOW DOES LATS MEASURE AVIATION SYSTEM PERFORMANCE?

This study includes the 140 public-use airports open during 2005. The FAA's Advisory Circular 150/5070-7, The Airport Planning System Process, was used to evaluate the system. The data used in the report is based on the system conditions in 2005, therefore, Evergreen Field is listed, although it closed in July 2006. Lester State is also listed, although it has been closed to fixed wing aircraft traffic since flooding destroyed the runway.

How Does LATS Measure Aviation System Capacity and Services?

As a statewide aviation system plan, LATS involves an evaluation of numerous capacity factors that help describe existing airport facilities and services as well as quantify capacity utilization. These factors range from physical elements, such as runway length, hangar space and lighting systems, to less tangible items, like local policies and regulations, ground transportation access, and local funding abilities that support airport improvements. All together, these elements help us define how well the existing aviation system is functioning to meet Washington's air transportation needs. Summarized in the data tables and charts below are results from the extensive statewide airport inventory survey performed in June. Unless otherwise noted, all data is sourced to the inventory survey.

Capacity Assessment

While an assessment of the existing facilities and services available at an airport helps in understanding the quality of access at airports in Washington, a true measure of the adequacy of air transportation facilities is only possible through an assessment of facility capacity. Airport capacity is a measure of an airport's ability to serve demand, whether operations, passengers or other. The objective of a capacity determination is to measure the ability of the existing airport's components to accommodate both current activity as well as future levels. In this report, six different airport components will be measured as outlined in Figure 2 on the following page.

Figure 2: Capacity Assessment Airport Components

Component	Description
Annual Aircraft Operations	The capacity of an airport's runway system to accommodate the number of operations (take-offs or landings) that can occur annually at an airport without experiencing delays.
Airline Passengers	The ability of an airport to accommodate airline passengers depends on the terminal facilities available including roadways, parking and passenger terminal building.
Air Cargo	Air Cargo capacity at airports is commonly measured as the annual enplaned tonnage that can reasonably be processed through existing facilities.
Aircraft Storage	Providing hangar and tiedown facilities is essential to the success of the aviation system. Many of the based aircraft are used for business purposes in the local community. In addition to locations for based aircraft, there is a substantial need for transient aircraft positions. When aircraft move from one airport to another in the course of completing business in the various communities, maintaining a location where they are able to park for several hours or multiple days is essential for support to aviation users and future airport development.
Undeveloped Land	Undeveloped land with access to runways and taxiways is important to the future growth of an airport. This developable land allows airports to expand in support of growth in operations and offers aviation business room for growth and expansion.

Facilities and Services Assessment

The purpose of the activities, facilities and services assessment was to describe the level of service at Washington's aviation system, drawing from the information from the online inventory survey, aviation planning documents, and stakeholder interviews. This is a measure of the quality of access provided for air transportation needs in the state. The research questions addressed in the assessment include:

- What types of commercial and GA activities take place at Washington's airports?
- What is the level of passenger, cargo, and GA activity at the airports?
- What size, type and number of aircraft can be accommodated at Washington's airports?
- Which airports can be accessed in poor weather conditions?

- What pilot and aircraft support services are available at Washington's airports?
- The proposed state airport classification system is used to guide the facilities and services assessment.

State Airport Classification System Minimum Criteria

There are several measures that serve as minimum criteria for airport performance. While not all airports meet these standards, they address basic issues that provide an indication of an airport's ability to operate safely now and into the future. The minimum criteria and benchmark criteria for airport facilities and services should be considered minimum thresholds for public use airports, and should not impose a ceiling if higher levels of facilities or services are needed. Minimum criteria are proposed for the overall classification and benchmark criteria are proposed to apply to each of the state classifications to meet established facility objectives and assist in targeting investments.

Figure 3: State Airport Classification System Minimum Criteria

Component	Description
Visual Navigation Aids	Airport visual aids are used to provide information and guidance to pilots maneuvering on airports.
Local Support	This measure is an indicator of a community's ability and willingness to support maintenance and improvement of its airport.
Operational Safety Issues	Many airports in the aviation system do not currently meet many of the FAA standards for airport runway width, taxiway separation and other issues that contribute to a safe aviation system.
Compatible Land Use and Zoning	The primary purpose of land use controls around an airport is to protect the airport environs from encroachment that could compromise the integrity of the airport operations, now or in the future.
Airport Zoning	Appropriate on-airport zoning is also important to protecting airports from incompatible land uses that could compromise the integrity of airport operations. Airport, Industrial, and Public Use are zoning designations that are appropriate for airport property.
Obstructions	Obstructions are objects such as terrain, buildings, trees, and vehicles that could be hazardous to aircraft during takeoff or landing.

State Airport Classification System Performance Objectives

While the previous section described minimum criteria that apply to all airports in the state aviation system, the following elements are performance objectives customized for each of the five state airport classifications. The assessment of airport facilities and services is used to measure system performance. Draft performance objectives have been set for each classification appropriate to the function and role those airports serve in the state aviation system. The draft performance objectives address the following types of facilities and services:

Figure 4: State Airport Classification System Performance Objective

Component	Description
Passenger Terminal	Having a passenger terminal is critical to having scheduled commercial service at an airport. Aside from the obvious benefits of protecting travelers in inclement weather, comfort and convenience is part of the travel experience that is a minimum expectation for both airlines and passengers.
Runway Length	The runway length performance objective for each state classification is based on accommodating the type of aircraft and/or the instrument approach level that is appropriate for the airport role.
Taxiway	The taxiway criterion relates to whether or not aircraft must taxi on the runway before takeoff or after landing. The lack of a full-length parallel taxiway connected to both ends of a runway reduces its capacity for aircraft operations and enhances safety.
Runway Lighting	Runway lighting refers to the type of edge lighting provided around the runway. Runway lights help pilots identify the runway location as they approach the airport to land and enhance safety.
Approach	The type of runway approach available at an airport—visual or instrument—determines whether or not the airport can be used in rainy, foggy, snowy, and dark conditions.
Vertical Glide Slope Indicator (VGSI)	VGSI are navigational aids used during visual approaches. Lights convey to the pilot whether the aircraft is on the appropriate glide path to the runway threshold.
Weather Reporting	Weather reporting on a real-time basis is important to aviation safety, particularly in areas where visibility can decrease quickly. In addition, weather reporting equipment that can provide a certified altimeter reading is required for a runway to have an instrument approach.
Fuel Sales	Having fuel available for sale is an airport service that supports the viability of an airport and represents a potential source of revenue for the owner/operator.
Maintenance	Having aircraft maintenance service available is also important, particularly at larger airports. Maintenance levels identified for performance criteria are Full-Service Fixed Base Operator (FBO), Major Maintenance, and Minor Maintenance.

How Does LATS Evaluate Regional Aviation Performance?

Information in this report is presented at four different geographic levels to show how various areas of Washington State are served by access to the aviation system.

Statewide Level

LATS findings will be incorporated into the statewide multimodal transportation plan, the Washington Transportation Plan (WTP), which addresses state-owned and state-interest transportation facilities. A major emphasis of the WTP is the improvement and integration of all transportation modes to create a seamless intermodal transportation system for people and goods. Plans developed as part of WTP must be consistent with the state transportation policy plan and each other, reflect public involvement, be consistent with regional transportation planning, high-capacity transportation planning, and local comprehensive plans prepared under chapter 36.70A RCW, and include analysis of intermodal connections and choices.

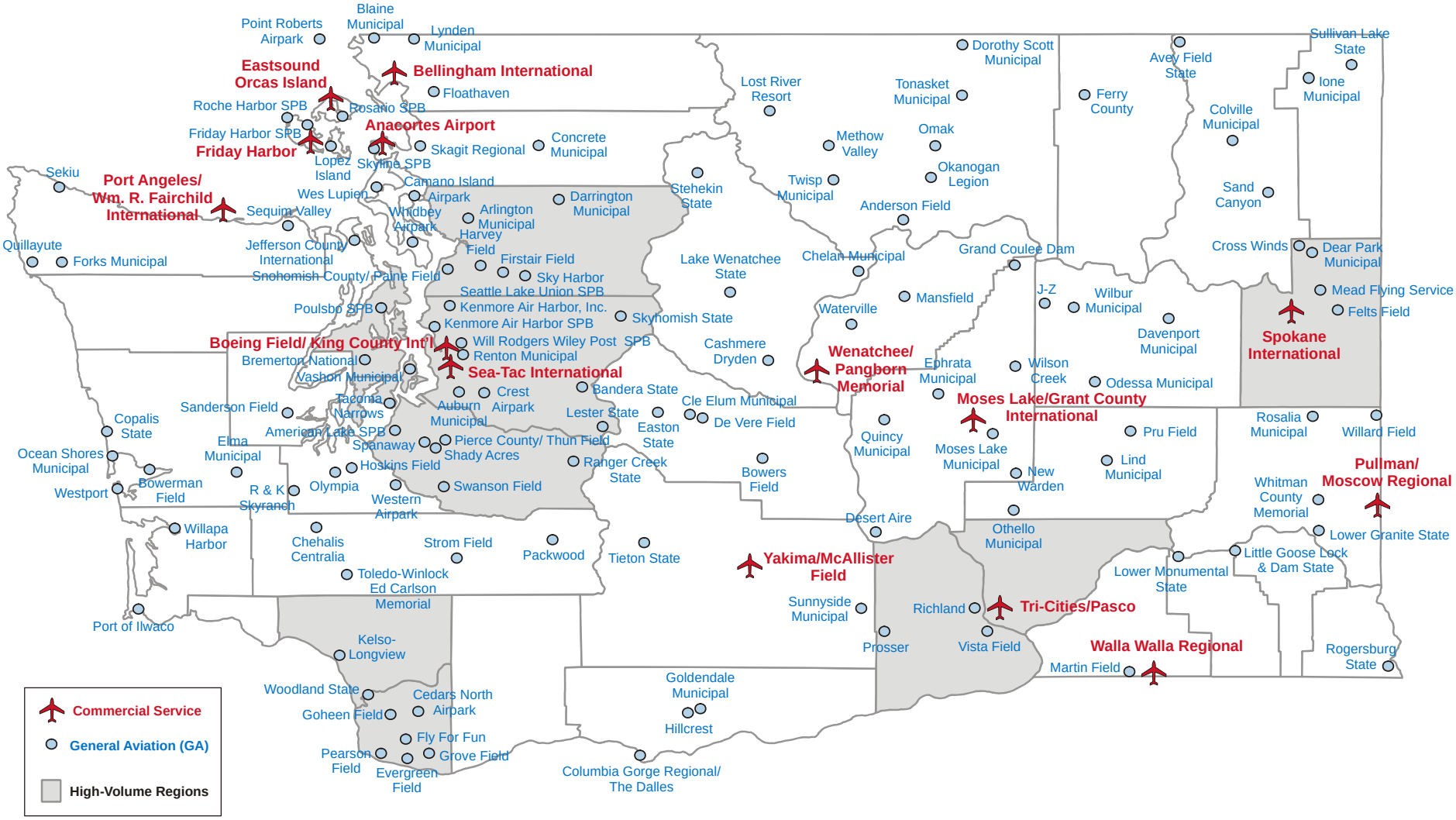
Special Emphasis Regions

ESSB 5121 specifically designates four geographic areas as warranting more detailed analysis than the remainder of the state because they constitute key centers of population, employment and economic activity. Activity within these regions has been recognized as being vital to the overall economy of the state. The four designated areas are:

- The Puget Sound Region, consisting of King, Snohomish, Pierce, and Kitsap Counties.
- Southwest Washington, consisting of Clark and Cowlitz Counties.
- Spokane Region, consisting of Spokane County.
- The Tri-Cities area, consisting of Benton and Franklin Counties.

Figure 5 on the following page shows the location of these Special Emphasis Regions. Within these areas it is deemed necessary to assure that both commercial service (passenger and cargo) and general aviation facilities are adequate not only for current conditions but also to support future economic growth. Without adequate air transportation, the future growth of population and overall economic conditions could be adversely impacted.

Figure 5: ESSB 5121 Special Emphasis Regions



Phase I places particular emphasis on analysis of airports within these four areas, including an assessment of the implications of air traffic management procedures and airspace conflicts as they may impact individual airport as well as regional capacity.

The Special Emphasis Regions are a major focus of LATS because they represent areas that currently have a large population base, have been growing rapidly since 1990 and are projected to continue to grow over the next 20 years.

Figure 6: Population of the Special Emphasis Regions

Region	2005 Population (000)	Projected Growth 2025
PS Region	3,619	34%
Spokane Region	522	52%
SW WA Region	470	40%
Tri-Cities Region	220	39%
All Other	1,790	45%
WA State	6,621	39%

Note: All Other includes 30 counties
Source: WA Office of Financial Management

These regions have also experienced among the highest employment growth levels in the state and represent 79 percent of the personal income generated in the state.

Figure 7: Employment Growth in the Special Emphasis Regions

Region	Pers. Income 2004	Percent of Total	Cumm Total
Puget Sound	140,062,464	64.1%	64.1%
SW WA	14,318,098	6.6%	70.7%
Spokane	12,212,265	5.6%	76.3%
Tri Cities	6,017,151	2.8%	79.0%
All Other	45,772,310	21.0%	100.0%
WA	**218,382,288**	**100.0%**	

Note: All Other includes 30 counties
Source: WA Office of Financial Management.

In addition to population, they are the regions that have the busiest aviation activity. The Puget Sound Region, Tri Cities and Spokane are the top three busiest commercial service airports in the state. More

importantly, passenger traffic has continued to grow over the last 10 years whereas almost all other markets have contracted with the exception of Boeing Field and Walla Walla. In addition, these regions represent over 61 percent of the state's aircraft operations. Clark County, which borders the high population area of Greater Portland, Oregon, has seven general aviation airports that are highly active, down from eight in the last year. One of these facilities, Evergreen Airport, has closed and a second primary GA airport, Pearson, has limited ability to expand. These facilities will impact the GA capacity in this fast growing region in the near term. It is important these regions are examined because they will most likely face constraint issues sooner than other parts of Washington and the long term planning issues should begin earlier for these high growth markets.

Figure 8: Aviation Activity in the Special Emphasis Regions

RTPO Region	2005 Operations	Percent of Total
Puget Sound	1,668,382	45.5%
Spokane	207,367	5.7%
Benton - Franklin - Walla Walla	188,847	5.1%
SW Reg Trans Council	108,350	3.0%
Subtotal	2,172,946	59.2%
All Other	1,495,138	40.8%
Total Operations	**3,668,084**	

No	Airport	CY 1995	CY 2005	Percent Change from 1995
1	Seattle	11,386,993	14,672,479	28.9%
2	Spokane	1,490,700	1,580,852	6.0%
3	Tri Cities	172,489	240,613	39.5%
4	Bellingham	128,681	101,147	-21.4%
5	Yakima	87,218	57,608	-33.9%
6	Wenatchee	49,538	38,367	-22.6%
7	Walla Walla	22,461	24,700	10.0%
8	Boeing Field	4,368	24,511	461.1%
9	Pullman/Moscow	36,764	22,837	-37.9%
10	Moses Lake/Grant County	10,831	4,742	-56.2%
	All Other	101,292	83,694	-17.4%
	Total WA	**13,491,335**	**16,851,550**	**24.9%**

Source: USDOT, O&D Survey, 2005

Regional Transportation Planning Organizations (RTPO)

Consistent with WSDOT's emphasis on integration with regional and local planning, LATS also includes a regional evaluation of the aviation system to connect LATS findings with WSDOT's transportation planning partners, including local, regional and state agencies. Information is provided for Washington's 14 RTPOs, which cover 38 of the state's 39 counties. These organizations develop regional transportation plans and coordinate regional transportation planning among cities, counties, port authorities, public transportation providers, WSDOT and other agencies. The planning areas covered by each organization are shown in the map in Figure 9.

Figure 9: Washington Regional and Metropolitan Transportation Planning Organizations

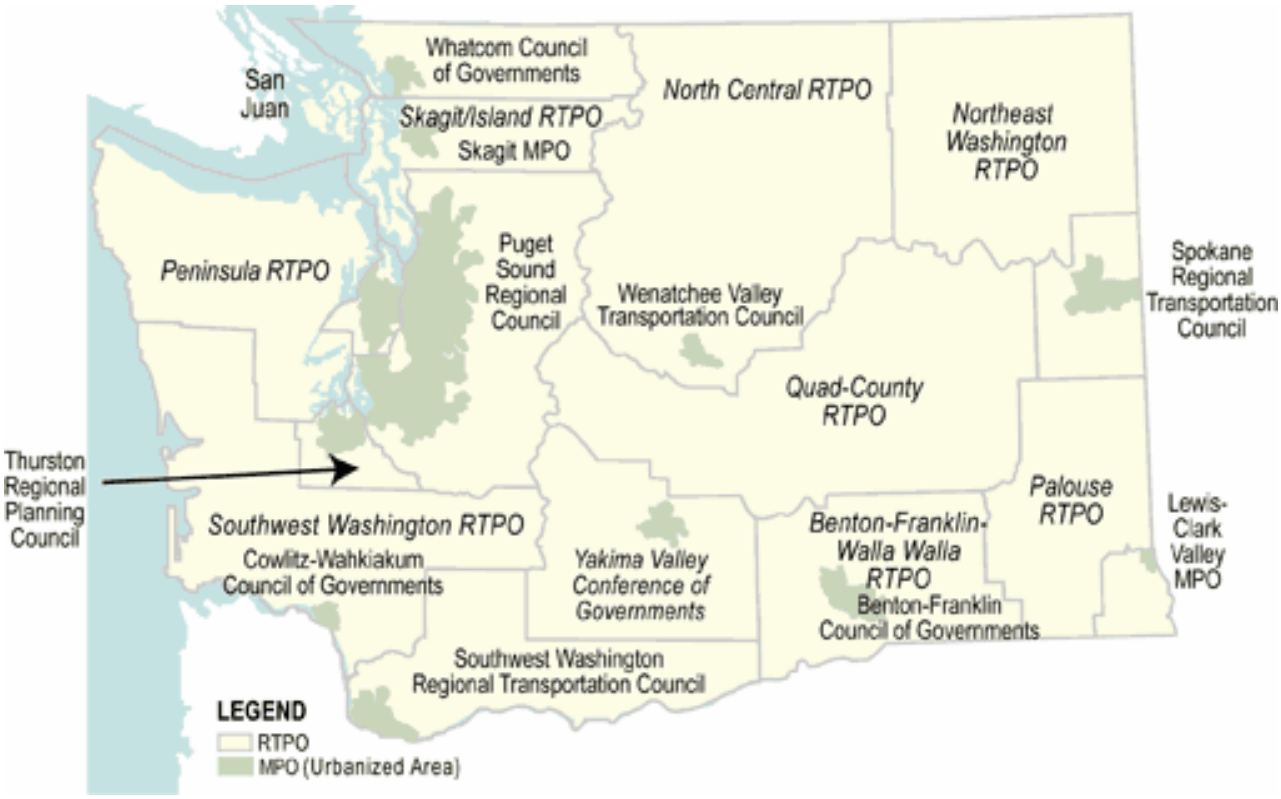


Figure 10 lists the RTPOs and the number of airports located within each RTPO. Summarizing airport demand and capacity by RTPO will facilitate meaningful regional analysis of airport and ground transportation systems, land use planning issues, and airport development constraints. This approach will also facilitate participation of the RTPOs and MPOs in LATS, as appropriate to the role each airport plays within each planning region.

Figure 10: Washington Public Use Airports by RTPO

Regional Transportation Planning Organization (RTPO)	Number of Airports
Benton-Franklin-Walla Walla RTPO	7
North Central RTPO	15
Northeast Washington RTPO	6
Palouse RTPO	7
Peninsula RTPO	7
Puget Sound Regional Council	27
Quad-County RTPO	19
Skagit/Island RTPO	7
Southwest Washington Regional Transportation Council	9
Southwest Washington RTPO	13
Spokane Regional Transportation Council	5
Thurston Regional Planning Council	4
Whatcom Council of Governments	5
Yakima Valley Council of Governments	3
No RTPO – San Juan Islands	6

Individual Airports

The Phase I report includes summaries of data collected for each individual airport. This information will be available on the WSDOT Web site and by request for use by airport sponsors and local governments for ongoing planning.

How Does LATS Evaluate the Role of Airports in the National and State Aviation Systems?

Federal and state airport classification systems identify the roles of individual airports and are used to understand and measure the performance of public-use airport systems.

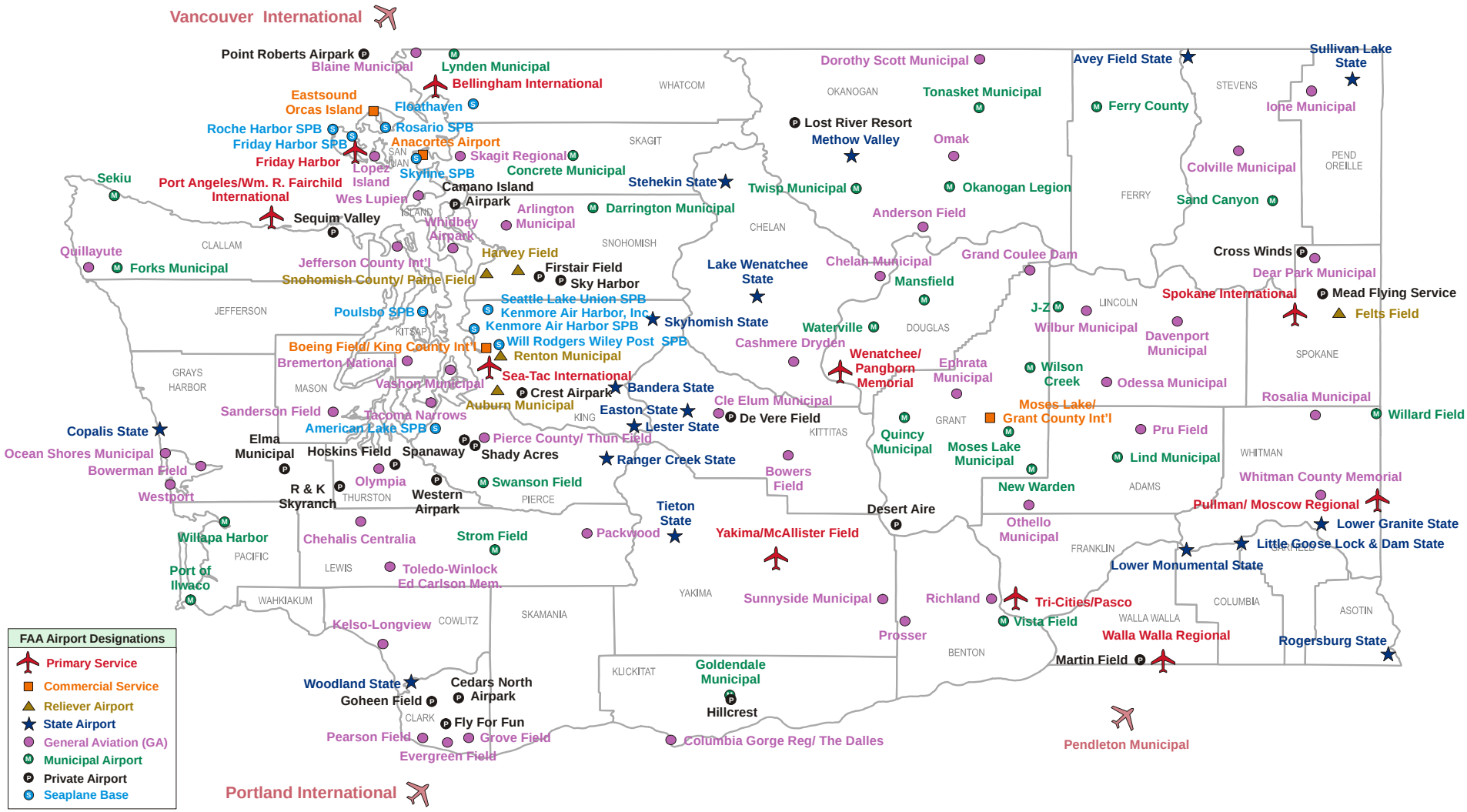
The FAA identifies airports that are important to the national air transportation system and classifies them, focusing largely on facilities with commercial passenger service. The FAA's airport classifications determine apportionment, or "entitlement" funding, for the Airport Improvement Program.

Many states also classify airports according to their roles within the state air transportation systems. As part of LATS, WSDOT is proposing state airport classifications for the public-use airports in Washington. State airport classifications do not supersede FAA classifications, but supplement them by including airports that are not deemed nationally significant and by further subdividing the largest FAA classification--general aviation airports. General aviation airports include airports in small towns that are home to a handful of piston aircraft, busy airports in urban areas used by business jets, and the full range of airports between those extremes, including airports with water landing areas. State airport classifications, along with the identification of facilities and services appropriate for each classification, help identify and prioritize airport improvement and funding needs.

Understanding the Role of Washington Airports in the National Aviation System

The NPIAS is prepared by FAA and submitted to Congress. The NPIAS is used by FAA management in administering the AIP. It supports the FAA's goals identified in the Flight Plan (2004-2008) for safety and capacity at airports by identifying the specific airport improvements that will contribute to achievement of those goals. The plan for 2005 identified 3,344 existing airports that are significant to national air transportation and, therefore, eligible to receive grants under the FAA AIP. In Washington State, 65 of the 140 airports included in the system are NPIAS airports.

Figure 11: NPIAS and Non NPIAS Airports



This includes all of the commercial service, relievers (high capacity general aviation airports in metropolitan areas), and select general aviation airports. The NPIAS classifies each airport according to the type of service that is provided to the community. The definitions used are as follows:

Primary Airports

Primary airports are grouped into four categories: large, medium, small, and non-hub airports. The term "hub" is used by the FAA to identify very busy commercial service airports.

- Large hubs are those airports that each account for at least one percent of total U.S. passenger enplanements whether they originate in the local community or consist of connecting passengers transferring from one flight to another. Large hub airports tend to concentrate on airline passenger and freight operations and have limited general aviation activity. Thus, locally based general aviation activity has a relatively small role at most large hub airport. There are 30 large hub airports that enplane approximately 70 percent of the annual passenger traffic in the US.

- Medium hubs are defined as airports that each account for between 0.25 percent and one percent of the total passenger enplanements. There are 37 medium hub airports in the United States, and together they account for 20 percent of all enplanements. Medium hub airports usually have sufficient capacity to accommodate air carrier operations and a substantial amount of general aviation activity.

- Small hubs are defined as airports that enplane 0.05 percent to 0.25 percent of the total passenger enplanements. There are 68 small hub airports throughout the country, which together account for eight percent of all enplanements. Less than 25 percent of the runway capacity at small hub airports is used by airline operations, so these airports can accommodate a great deal of general aviation activity.

- Commercial service airports that enplane less than 0.05 percent of all commercial passenger enplanements but more than 10,000 annual enplanements are categorized as non-hub primary airports. There are 247 non-hub primary airports that together account for three percent of all enplanements. These airports are heavily used by general aviation aircraft.

Commercial Service

Commercial service airports that have from 2,500 to 10,000 annual passenger enplanements are categorized as non-primary commercial service airports. There are 127 of these airports in the NPIAS, and they account for 0.1 percent of all enplanements. These airports are used mainly by general aviation.

Reliever Airports

General aviation pilots often find it difficult and expensive to gain access to congested airports, particularly large and medium hub airports. In recognition of this, the FAA has encouraged the development of high capacity general aviation airports in major metropolitan areas. These specialized airports, called relievers, provide pilots with attractive alternatives to using congested hub airports. They also provide general aviation access to the surrounding area and must have 100 or more based aircraft or 25,000 annual itinerant operations. All airports that are designated as relievers by the FAA are included in the NPIAS.

General Aviation Airports

Communities that do not receive scheduled commercial service or that do not meet the criteria for classification as a commercial service airport may be included in the NPIAS as sites for general aviation airports if they account for enough activity (usually at least 10 locally based aircraft) and are at least 20 miles from the nearest NPIAS airport. The activity criterion may be relaxed for remote locations or other mitigating circumstances. The 2,556 general aviation airports in the NPIAS tend to be distributed on a one-per-county basis in rural areas and are often located near the county seat. These airports account for 40 percent of the nation's general aviation fleet. They are the most convenient source of air transportation for about 19 percent of the population and are particularly important to rural areas. The airports within Washington and their respective NPIAS classification are shown in the Appendix.

Airports not Included in the NPIAS

The NPIAS includes 3,344 of the 5,280 U.S. airports that are open to the public. There are 1,936 airports open to the public that are not included in the NPIAS, including 944 publicly owned, public use airports that are not included because they do not meet the minimum criteria for the NPIAS of 10 based aircraft, are within 20 miles of a NPIAS airport, or are located at inadequate sites or cannot be expanded and improved to provide safe and efficient airport facilities. The FAA usually recommends replacement of

inadequate airports. The remaining 992 airports are privately owned, public use airports that are not included because they are located at inadequate sites, are redundant to publicly owned airports, or have too little activity to qualify for inclusion. In addition, 14,296 civil landing areas that are not open to the general public are not included in the NPIAS. The airports that are not included in the NPIAS have an average of one based aircraft, compared to 33 based aircraft at the average NPIAS general aviation airport (AIP).

In Washington State there are eleven primary, three commercial, five reliever and 46 general aviation facilities for a total of 65 NPIAS airports. There are 75 Non-NPIAS airport facilities that make up the remaining public use airport system of Washington. A detailed summary of each airport by FAA Classification can be found in the technical appendix of the report.

Understanding the Role of Airports in the State Aviation System

Within the air transportation system, individual airports contribute at different and varying levels and serve different roles to meet growing populations and economic demand. Determining the contribution each airport makes to the local community, region, state, and nation is an important step in evaluating how well Washington is served by its air transportation system. Once gaps in service, and deficiencies in infrastructure, are identified, funding resources can be allocated effectively to upgrade airport facilities to meet future demand and capacity needs.

To address these issues, WSDOT Aviation set upon a course to evaluate all 140 public use airports within the air transportation system and establish a state classification system that recognizes the various roles airports play based on geographic location, population and economic relationships. Critical to this evaluation is the need to specify airport facility objectives for each classification to describe the role of each group of airports within the state system and to guide future improvements. Proposed facility objectives assist in determining gaps and deficiencies to target funding resources. The classification system represents the current role of each airport in the aviation system, while the performance objectives target needed improvements to maintain and expand the overall service level of each class of airport in order to meet air transportation needs.

It is the intent of LATS to refine and finalize the list of airports under each classification at the end of Phase II, after completion of aviation demand forecasts. The respective facility and service objectives established for each classification will also be refined.

Establishing the State Airport Classifications

The draft Washington State Airport Classifications were developed over a three year period in consultation with several statewide, interjurisdictional working groups:

- In 2003, an interjurisdictional Aviation System Plan Study Team recommended that a state airport classification system be established to identify each airport's contribution or role, and that minimum criteria and performance objectives be established to identify the facilities and services required for each classification to function adequately.
- In 2004, a 22-member workgroup was established to identify a classification system for Washington State aviation facilities
    - Commercial Service Airports
    - Regional Service Airports
    - Local Community Airports
    - Recreation or Remote Airports
    - Seaplane Bases

Figure 12: Contributing Factors

Factors	Use in Determining the Role of Airports in the State System
Access	Access is typically associated with providing air transportation for the movement of people and goods, and providing reasonable access times to the state's population, employment centers and remote or isolated communities. Population, population density, employment, primary road access, based aircraft, and number of registered aircraft and pilots are some of the determining factors when considering coverage and access to the aviation system.
Airport Facilities	Airport facilities determine the range, type and use of an airport and are based on a coding system identified as the Airport Reference Code (ARC). ARC identifies the operational characteristics of the types of aircraft that most frequently operate at an airport. ARC is based primarily on an aircraft approach speed and wingspan. Typical airport facilities include length and width of runways, approach capabilities, taxiway and weather system.

Factors	Use in Determining the Role of Airports in the State System
Airport Services	Airport services are much like facilities, supporting aviation activities that contribute to the role and utilization of an airport. Services that may be considered include fueling stations, aircraft repair and maintenance services, the availability of air charter services and flight training.
Expansion and Preservation Capabilities	Expansion capability affects the ability of an airport to make safety improvements and grow to meet future aviation demand. Determining factors may include local support, operational safety issues, height obstructions, and environmental or manmade factors.
Economic Opportunities	Airports play a significant role in state, regional and local economies. The size of the surrounding community, level of airport facilities, availability of aviation services, and ability to expand determine an airport's contribution to the economic growth of a community. Higher concentrations of based aircraft, registered pilots and aircraft usually indicate higher levels of public access and economic opportunities.

With the identification of demand factors and attributes, minimum threshold criteria were defined for each classification category based on their intended function and demand relationship. The se criteria include runway length, based aircraft, service area, or special characteristics such as scheduled passenger service or water landing areas. For example, the proposed minimum threshold criterion for commercial airports is based on whether or not the airport has had at least 2,500 or more scheduled passenger boarding per year. (This criterion is also among those used by the FAA to identify commercial service airports

The minimum criteria help set a baseline for analysis of the aviation system and assist in identifying deficiencies and strategies to guide system improvements. During the Phase II analysis, during which aviation demand forecasts will been prepared, it may be necessary to adjust the criteria for each classification, and therefore the assignment of individual airports. The classification system will be finalized at the end of Phase II.

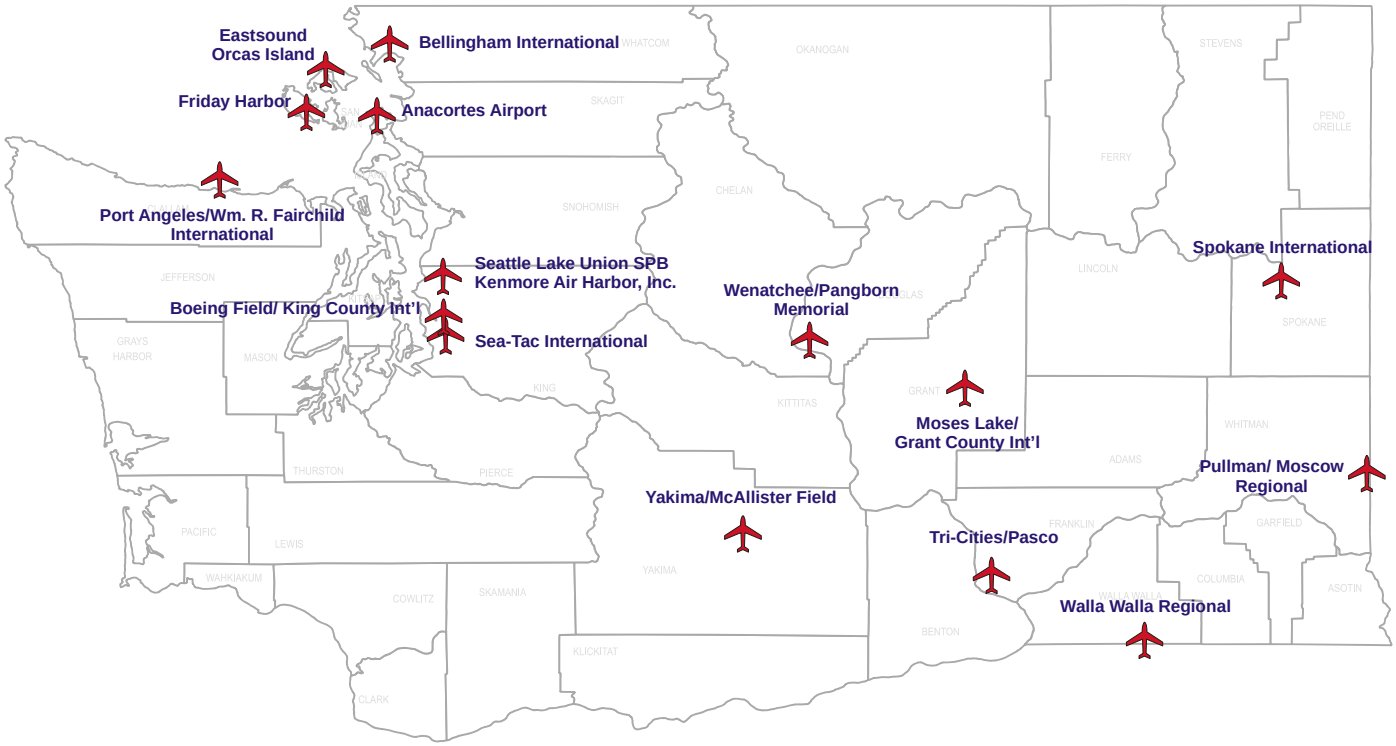
1. Commercial Service Airports

Commercial airports provide scheduled air carrier and/or commuter service to in-state, domestic, and (in some cases) international destinations. These airports have expansive geographic service areas and are located in Washington's largest population centers.

Airports preliminarily assigned to the Commercial Service classification can accommodate commercial passenger service. Commercial Service airports were determined by the following threshold criteria:

- Accommodate at least 2,500 scheduled passenger boardings per year.
- May be classified as commercial service, primary, nonhub, small hub, medium hub, or large hub (NPIAS) airports.

Figure 13: Washington State Commercial Service Airports (Proposed State Airport Classification)



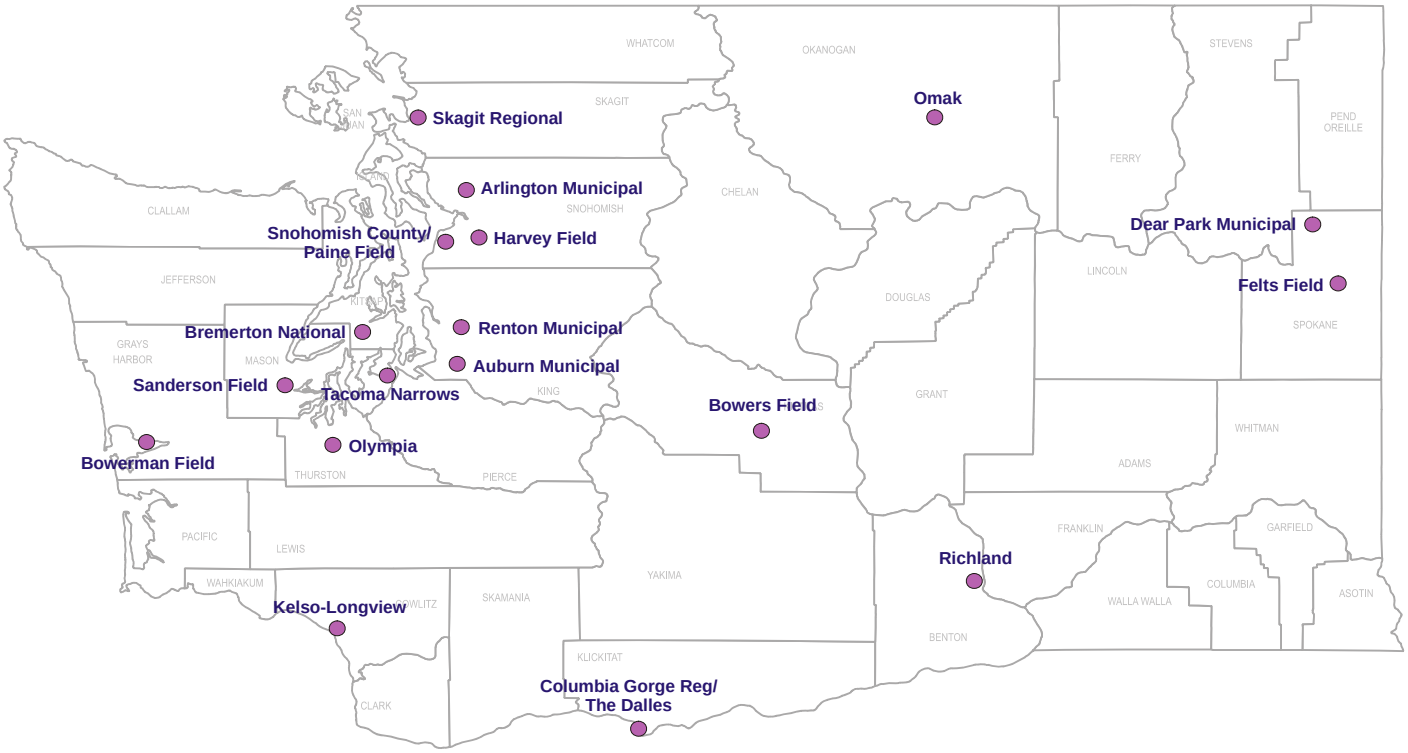
Name	City
Anacortes	Anacortes
Bellingham International	Bellingham
Boeing Field/King County International	Seattle
Friday Harbor	Friday Harbor
Grant County International	Moses Lake
Kenmore Air Harbor, Inc.	Seattle
Orcas Island	Eastsound
Pangborn Memorial	Wenatchee
Pullman/Moscow Regional	Pullman / Moscow, ID
Sea-Tac International	Seattle
Spokane International	Spokane
Tri-Cities	Pasco
Walla Walla Regional	Walla Walla
Wm. R. Fairchild International	Port Angeles
Yakima Air Terminal	Yakima

2. Regional Service Airports

Regional Service airports serve a large to medium market area, or remote communities such as the San Juan Islands. They may include air cargo service and reliever airports. They are capable of accommodating all general aviation aircraft, facilities and services, including business jets. Airports preliminarily assigned to the Regional Service classification can accommodate high aviation activity levels, can accommodate nearly all types of general aviation aircraft, and are capable of supporting business jets and charter flights. Regional Service Airports were determined by the following threshold criteria:

- Accommodate aircraft in inclement weather.
- Have at least 40 based aircraft and a runway at least 4,000 feet long.
- Have 90-minute (driving time) service area coverage.

Figure 14: Washington State Regional Service Airports (Proposed State Airport Classification)



Name	City
Arlington Municipal	Arlington
Auburn Municipal	Auburn
Bowerman Field	Hoquiam
Bowers Field	Ellensburg
Bremerton National	Bremerton
Columbia Gorge Regional/The Dalles	The Dalles
Deer Park Municipal	Deer Park
Felts Field	Spokane
Harvey Field	Snohomish
Kelso-Longview	Kelso
Olympia	Olympia
Omak	Omak
Renton Municipal	Renton
Richland	Richland
Sanderson Field	Shelton
Skagit Regional	Burlington/Mount Vernon
Snohomish County/Paine Field	Everett
Tacoma Narrows	Tacoma

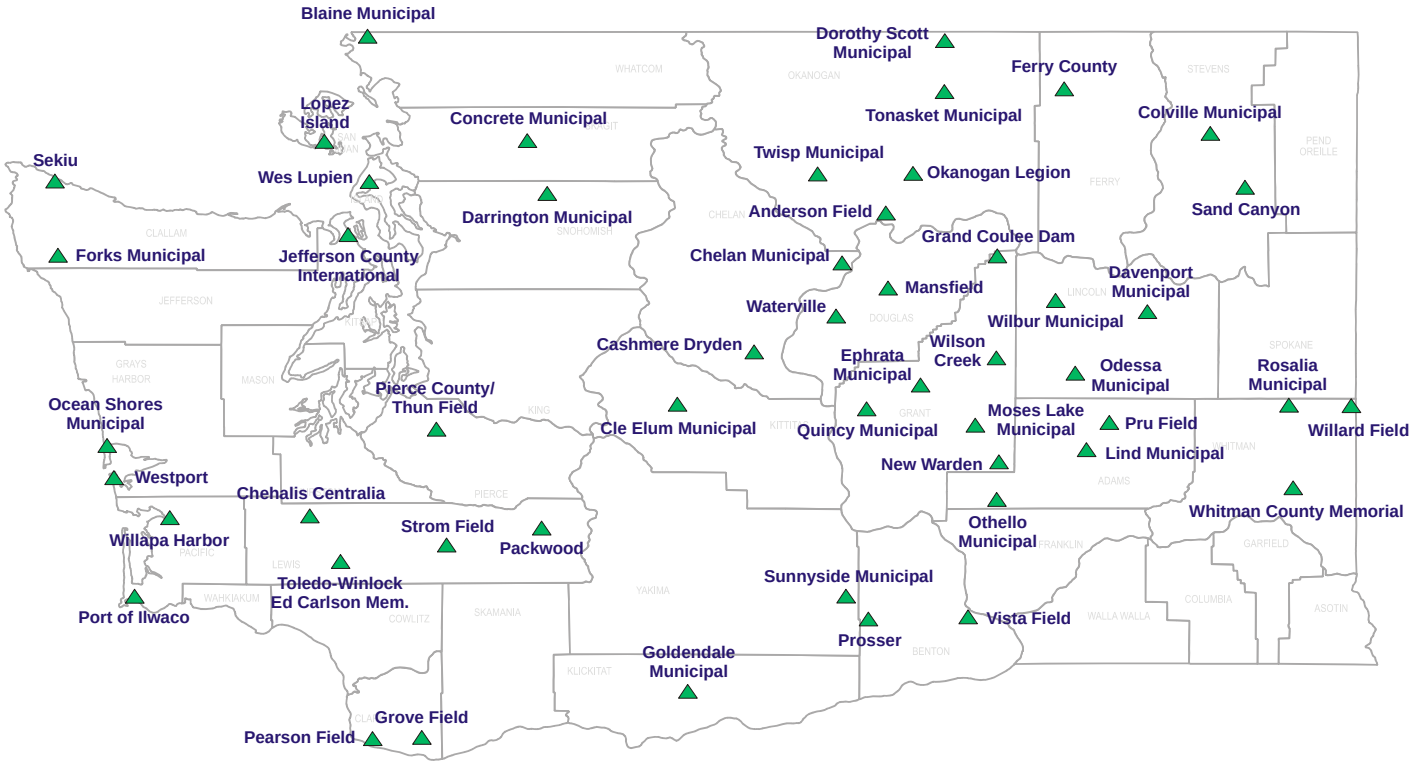
3. Local Community Airports

Local Community service airports are generally medium to low activity facilities in small or medium-sized communities, and may include air cargo service. These airports may have limited general aviation facilities and services. They may also have development constraints such as airspace conflicts, environmental concerns, topography, competing aeronautical services, surrounding land use patterns and ownership status.

Airports within this classification were further segregated into airports with more than 10 based aircraft and those airports with fewer then 10 based aircraft to assist in identifying the appropriate level of facility needs to meet operational and safety improvement requirements.
Airports preliminarily assigned to the Local Community Service classification serve medium to small communities and can accommodate single and multi engine piston aircraft. Local Community Service Airports were determined by the following threshold criteria:

- Serve medium to small communities.
- Have 10 or more based aircraft.
- Have fewer then 10 based aircraft.
- Have 30-minute (driving time) service area coverage.
- Serve medium to small communities.
- Have 10 or more based aircraft.
- Have fewer then 10 based aircraft.
- Have 30-minute (driving time) service area coverage.

Figure 15: Washington State Local Community Airports (Proposed State Airport Classification)



10 Or More Based Aircraft

Airport	City
Anderson Field	Brewster
Blaine Municipal	Blaine
Cashmere Dryden	Cashmere
Chehalis Centralia	Chehalis
Chelan Municipal	Chelan
Colville Municipal	Colville
Concrete Municipal	Concrete
Davenport Municipal	Davenport
Dorothy Scott Municipal	Oroville
Ephrata Municipal	Ephrata
Goldendale Municipal	Goldendale
Grove Field	Camas
Jefferson County Int'l	Port Townsend
Lopez Island	Lopez
Moses Lake Municipal	Moses Lake

Airport	City
Odessa Municipal	Odessa
Okanogan Legion	Okanogan
Othello Municipal	Othello
Pearson Field	Vancouver
Pierce County/Thun Field	Puyallup
Prosser	Prosser
Rosalia Municipal	Rosalia
Sand Canyon	Chewelah
Sunnyside Municipal	Sunnyside
Ed Carlson Memorial Airport	Toledo
Tonasket Municipal	Tonasket
Waterville	Waterville
Whitman County Memorial	Colfax
Wilbur Municipal	Wilbur
Willard Field	Tekoa

Less Than 10 Based Aircraft			
Airport	**City**	**Airport**	**City**
Cle Elum Municipal	Cle Elum	Pru Field	Ritzville
Darrington Municipal	Darrington	Quincy Municipal	Quincy
Ferry County	Republic	Sekiu	Sekiu
Forks Municipal	Forks	Strom Field	Morton
Grand Coulee Dam	Electric City	Twisp Municipal	Twisp
Lind Municipal	Lind	Vista Field	Kennewick
Mansfield	Mansfield	Wes Lupien	Oak Harbor
New Warden	Warden	Westport	Westport
Ocean Shores Municipal	Ocean Shores	Willapa Harbor	South Bend (Raymond)
Packwood	Packwood	Wilson Creek	Wilson Creek
Port of Ilwaco	Ilwaco		

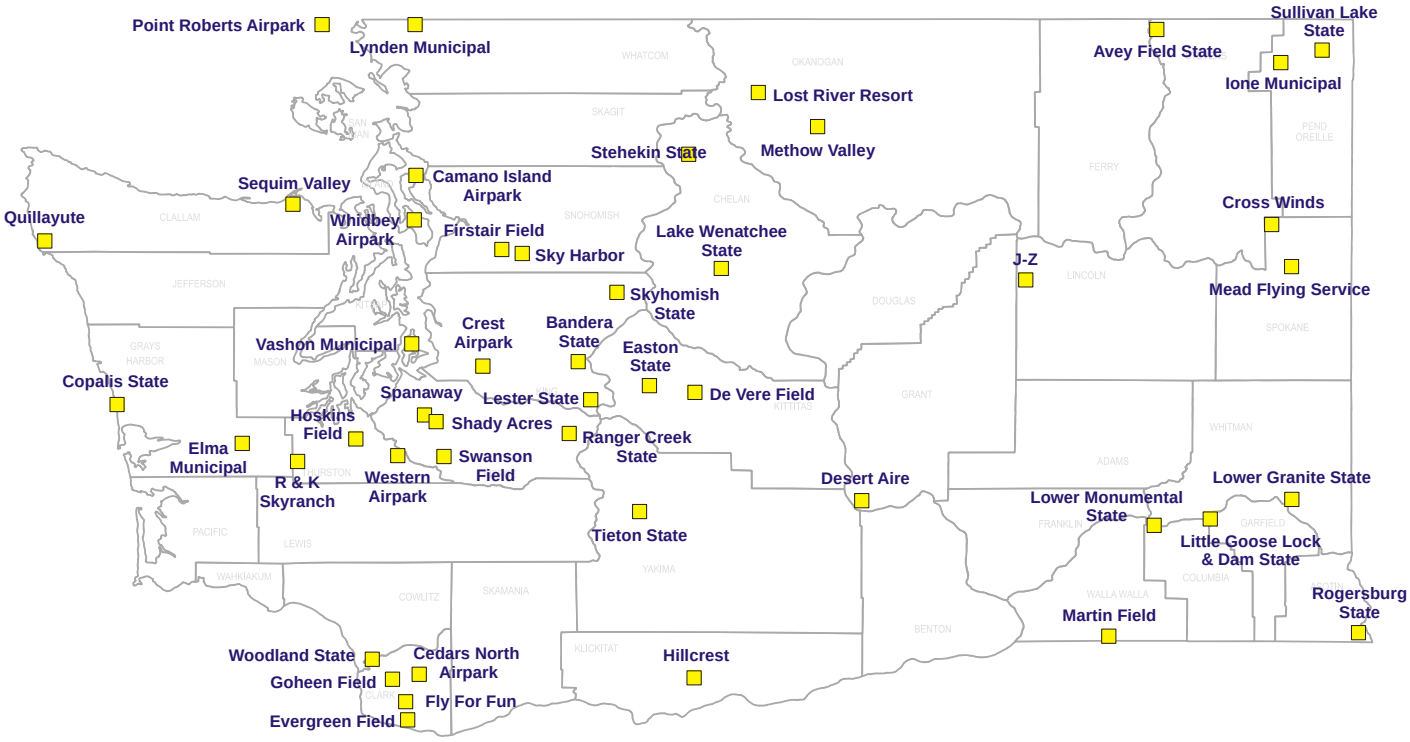
4. Recreation or Remote Airports

These are airport facilities that serve recreation communities or leisure destinations and remote backcountry locations. These airports may also be strategically located for emergency, medical and firefighting access in mountainous or other remote areas.

These types of airports were determined by the following threshold criteria:

- Serve recreation communities, and leisure destinations, or remote backcountry areas; may also be strategically located for emergency, medical, and firefighting access in mountainous or other remote areas.
- Serve airports that combine residential housing with the airport.

Figure 16: Washington State Recreation or Remote Airports (Proposed State Airport Classification)



Airport	City
Avey Field State	Laurier
Bandera State	Bandera
Camano Island Airfield	Stanwood
Cedars North Airpark	Battle Ground
Copalis State	Copalis
Crest Airpark	Kent
Cross Winds	Clayton
Desert Aire	Mattawa
DeVere Field	Cle Elum
Easton State	Easton
Elma Municipal	Elma
Evergreen Field	Vancouver
Firstair Field	Monroe
Fly For Fun	Vancouver
Goheen Field	Battle Ground
Hillcrest	Goldendale
Hoskins Field	Olympia
Ione Municipal	Ione

Airport	City
J-Z	Almira
Lake Wenatchee State	Leavenworth
Lester State	Lester
Little Goose Lock & Dam State	Starbuck
Lost River Airport	Mazama
Lower Granite State	Colfax
Lower Monumental State	Kahlotus
Lynden Municipal	Lynden
Martin Field	College Place
Mead Airport	Mead
Methow Valley	Winthrop
Point Roberts Airpark	Point Roberts
Quillayute	Quillayute
R & K Skyranch	Rochester
Ranger Creek State	Greenwater
Rogersburg State	Anatone
Sequim Valley	Sequim
Shady Acres	Spanaway

Airport	City
Sky Harbor	Sultan
Skykomish State	Skykomish
Spanaway	Spanaway
Stehekin State	Stehekin
Sullivan Lake State	Metaline Falls
Swanson Field	Eatonville

Airport	City
Tieton State	Rimrock
Vashon Municipal	Vashon
Western Airpark	Yelm
Whidbey Airpark	Oak Harbor
Woodland State	Woodland

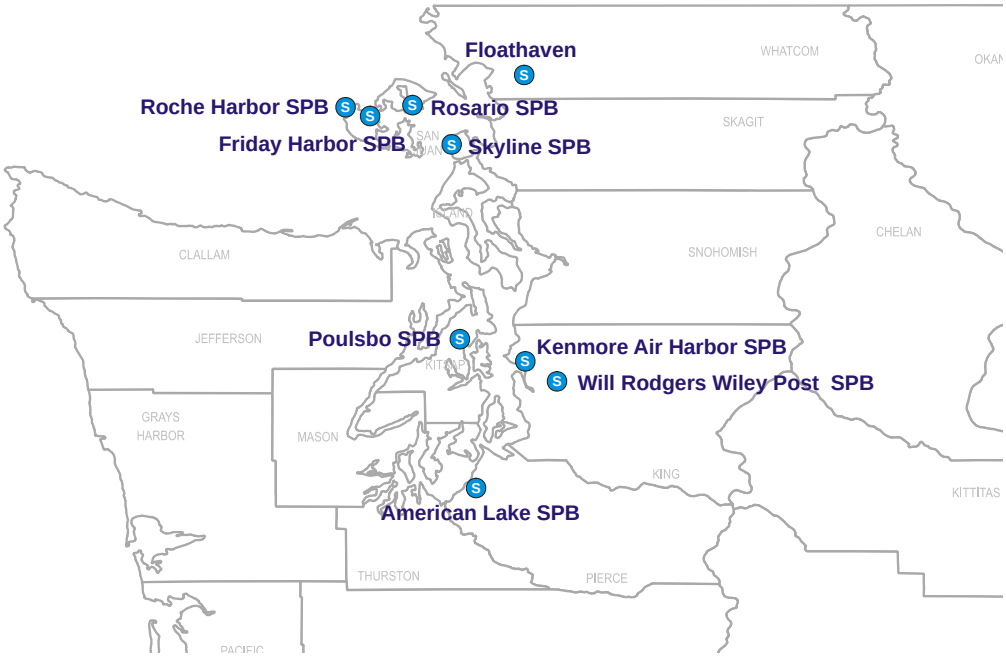
5. Seaplane Bases

Seaplane bases serve amphibious and float-equipped aircraft and may have some upland facilities. Most seaplane bases in Washington are located in the Puget Sound area. This classification does not include facilities that provide 2,500 scheduled passenger boardings per year, such as Kenmore Air Harbor which is designated as a commercial service airport.

Airports preliminarily assigned to the Seaplane Base classification provide facilities for amphibious and float-equipped aircraft. These types of airports were determined by the following threshold criteria:

- Are reported as seaplane bases in the Airport Facility Directory (based on FAA Form 5010 reports).

Figure 17: Washington State Seaplane Base Airports (Proposed State Airport Classification)



Airport	City
American Lake SPB	Tacoma
Floathaven SPB	Bellingham
Friday Harbor SPB	Friday Harbor
Kenmore Air Harbor SPB	Kenmore
Poulsbo SPB	Poulsbo

Airport	City
Roche Harbor SPB	Roche Harbor
Rosario SPB	Rosario
Skyline SPB	Anacortes
Will Rogers Wiley Post SPB	Renton

Measuring Aviation Performance Based on Airport Classification

While the classification system assigns airports based on their current function and role, the facility and service objectives set performance targets that identify service levels for each classification level and represent a future goal for the system. The performance objectives are used to evaluate activities, services and facilities and identify improvement needs to provide adequate service and meet aviation safety standards in the future. In some cases, an airport may decide to exceed these objectives to satisfy a particular local need or FAA design standard. There may also be instances in the system where an airport is not able to fully comply with all facility and service objectives.

The performance objectives are set for the system as a whole and for each classification individually to identify gaps and facilitate prioritization of needed improvements. In Phase I, the objectives are used as benchmarks to assess the existing system against the goals for future level of service. The objectives will be refined in Phase II. In Phase III, the Governor's Airport Planning Council will review information about how well the various airport classifications are meeting these measures, and recommend improvement priorities targeted towards the most critical needs.

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PART 4: DOES WASHINGTON'S AVIATION SYSTEM PROVIDE ADEQUATE CAPACITY TO MEET EXISTING DEMAND?

While an assessment of the existing facilities and services available at an airport helps in understanding the quality of access at airports in Washington, a true measure of the adequacy of air transportation facilities is only possible through an assessment of the facility's capacity. Airport capacity is a measure of an airport's ability to serve demand, whether operations, passengers or other. The objective of a capacity determination is to measure the ability of the existing airport components to accommodate both existing activity as well as future levels.

How is Existing Capacity Measured in This Report?

This report provides a capacity assessment for three geographic levels: Washington NPIAS system; Special Emphasis Regions of high growth, and RTPO. Six different airport components will be evaluated for each geographic level as follows:

1. Annual Aircraft Operations and Airfield Capacity

Measuring an airport's capacity is an important factor in decision-making regarding whether improvements to the airfield will be required to allow for future growth. It also allows the consequences of inaction to be assessed in terms of both time and money lost due to operational delay. For a state system plan, it is important to assess the capacity of the individual airports to determine whether capacity exists within the system to accommodate demand increases.

The capacity of an airport's runway system measures the number of operations (take-offs or landings) that can occur annually at an airport without experiencing delays. As the number of operations approach capacity, the average delay per operation increases. Operational delay results in time wasted waiting for the take-off or landing, and consequently costs the operator money. This can lead to decreased service, higher costs to consumers of the service or decisions to offer service at other, less constrained facilities. Ideally delay should be minimal.

The capacity of the airfield at an airport is directly related to the ability of its runway and taxiway system to safely allow aircraft to take off and land.

The capacity of the airfield is a measure of the theoretical maximum number of aircraft operations that can be accommodated on the airfield, or its components, over a specified period of time. There are a variety of techniques available for determining airfield capacity. The most widely accepted methodology is described in FAA Advisory Circular 150/5060-5, Airport Capacity and Delay. The analyses employed herein reference the guidance in this circular and two additional mathematical methods for determining the aircraft operational throughput capacity of the airfield system.

The capacity of a runway system considers several factors. Among these are:

- Meteorology
- Runway system configuration and use
- Air Traffic Control Procedures
- Aircraft fleet mix
- Operations characteristics to include the percent of operations that are arrivals and departures (affects hourly capacities), and the percent that are touch-and-go
- The availability and spacing of exit taxiways
- Runway length

For this report, airfield capacity will be measured in terms of the facility's Annual Service Volume (ASV). ASV estimates an airport's annual theoretical capacity to accommodate aircraft operations. The ASV accounts for differences in runway use, aircraft mix, weather conditions, and other factors that can occur over the period of a year. The ASV for the airports will be determined using the simple calculation methodology contained in FAA AC 150/5060-5. Where there was no parallel taxiway, the capacity was reduced by 25 percent. Where master plans or other studies contained a detailed examination of the capacity, these numbers were used.

2. Commercial Airline Passengers

The ability of an airport to accommodate airline passengers depends on the terminal facilities available including roadways, parking and passenger

terminal building. The goal in measuring capacity in the terminal area is to determine how many potential passengers that can be served in an hour with an acceptable level of customer service and convenience. As terminal facilities get busier passenger processing times tend to increase due to longer queues or wait times.

The passenger capacity of an airport is measured by the number of passenger boardings (or enplanements) that can be processed through the passenger terminal during the peak hour. This is an important measurement of an airport's capacity because it provides a theoretical measurement for the airport's ability to accommodate increased service levels, larger capacity aircraft or increased passenger loads. From a system perspective, if an individual airport does not have available capacity for passenger increases, steps need to be taken to provide additional capacity or the passenger increases will either not materialize or will be transferred to a different airport. This could strain the ability of that airport to accommodate increases in service in the future or hasten the needs for terminal improvements. Conversely, several airports may have excess capacity within their terminals but may not be in a position to experience increased service due to their lack of demand. Most of the commercial service airports in Washington have master plans or have recently completed other studies that have assessed the many factors (such as access road, auto parking, curb frontage, ticketing, security, and departure gates/lounges) that are used to determine the airport's terminal area needs. However, by and large these plans address required facilities to serve peak hour passengers rather than the terminal's capacity.

To evaluate the terminal capacity of the commercial service airports in Washington State for this study, the project team utilized an industry standard mathematical formula developed by the FAA and outlined in Advisory Circular 150/5360-13 "Terminal Planning and Design Guidelines". This AC suggests that approximately 150 square feet of building should be allotted for each peak hour enplaned passenger. Because this estimate was made prior to 2001, the 150 square feet per peak hour passenger ratio is most likely understated given the increased need for security facilities that have arisen since then. The figure used in this report is 175 square feet of passenger terminal per peak hour enplaned passenger.

This capacity estimate does not address the adequacy of individual facilities within the terminal. Such a determination requires an in-depth terminal programming and planning effort. Rather the terminal capacities shown herein will be limited to an estimate of whether adequate square footage is available for processing passengers. The underlying assumption is that internal reassignment of spaces could occur to address any inadequacies in specific facilities.

3. Air Cargo

Air cargo is an increasingly important component of economic activity and development supporting numerous facets of every day business and leisure activity. The growing dependence on internet purchases and transactions, both personal and business, continues to fuel the increase in air cargo growth worldwide. Air cargo capacity at airports is commonly measured as the annual enplaned tonnage that can reasonably be processed through existing facilities. When cargo volume exceeds the ability of the airport's facilities to process it efficiently, the cost of shipping by air increases. Alternatively, the cargo shipper may find that it is more efficient to ship by alternative methods (ground) or the cargo carriers may add processing facilities at a different airport, adding time and cost to their shipping process.

Air Cargo capacity at airports is commonly measured as the annual enplaned tonnage that can reasonably be processed through the existing facilities. In measuring capacity at airports it is important to measure an airport's ability to handle increased cargo loads to assess whether the system can accommodate the changing needs of the air cargo industry. It is established that air cargo is an essential ingredient in economic growth for a community and a region. Therefore, well distributed air cargo capacity throughout an aviation system can be seen as serving this vital role. This is especially true for more remote communities. Regional capacity is needed to assure that opportunities do not pass due to the lack of air cargo potential.

Where possible, cargo capacity will be adopted from Master Plans or similar recent studies. Otherwise it will be calculated at the standard of 2,000 annual enplaned pounds (one ton) per square foot of air cargo processing building. This figure represents an industry standard and is similar to the figure used in the PSRC "Regional Air Cargo Strategy Study".

Due to the diversity in cargo service in Washington, measuring capacity by using building size does not always work. Two of the busiest cargo airports in the state, Seattle-Tacoma International and Boeing Field/King County International provide apron area for loading and unloading cargo aircraft but much of the cargo processing takes place in buildings that are off-airport. For these, the data in the PSRC's "*Regional Air Cargo Strategy Study*" are referenced.

4. Aircraft Storage and Parking

Aircraft storage is an essential element of each airport's individual capacity and for the system as a whole. With more than 7,000 based aircraft in Washington State, maintaining locations for aircraft to be stored is essential to the success of the aviation system. Many of the based aircraft are used for business purposes in the local community. In addition to locations for based aircraft, there is a substantial need for transient aircraft positions. When aircraft move from one airport to another in the course of completing business in the various communities, maintaining a location where they are able to park for several hours or multiple days is essential for support to aviation users and future airport development. Aircraft based at the airports are stored in one of two areas: hangars or apron tie-downs. Aircraft tie-downs are provided for those aircraft that do not require, or do not desire to pay the cost for hangar storage. It is assumed that future storage spaces will reflect some of the characteristics of current storage patterns; however, it is anticipated that an increasing percentage of the based aircraft fleet will be stored in hangars for security and protection from the elements.

In addition to the needs of the based aircraft tie-down areas, transient aircraft also require parking areas at the airport. This storage is provided in the form of transient aircraft tie-down space. It should be noted that the future development of hangars and tie-downs are as demand dictates. Therefore, the number, type and location of these storage facilities will vary depending upon the demand for airport needs.

5. Undeveloped Land Available For Aviation Development

Another influence on the capacity of the system is opportunity for future expansion for aviation development. Numerous factors – both on and off airport property – contribute to expansion capability, including topography, adjacent land uses, local zoning and regulations, presence of wetlands, and future planning goals of the surrounding community. Undeveloped land is also an indicator of the ability of an airport to expand in order to support the operation and development of aviation facilities. The overall objective of the land development planning at the airport is the provision of facilities, which are conveniently located and accessible to the community, and which accommodate the specific requirements of airport users. Airports where land is not available may find it difficult to meet future capacity needs.

In the inventory survey, airport managers were asked to provide an estimate of undeveloped land available for aviation development. This estimate could include existing land owned by the airport that may or may not currently be designated for aviation uses. Phase II of this study will

investigate if the undeveloped land available is compatible for aviation use; more detailed analysis of each airport property is conducted as part of site planning. It is important to coordinate uses of the airport property in a manner compatible with the functional design of the airport facility. As a result, the geography, as well as, the size of the undeveloped land plays a significant role in determining whether the land available can be used for aviation development. In addition, the information collected on the undeveloped land available for aviation development will be used in Phase II to assess future capacity limitations and availability.

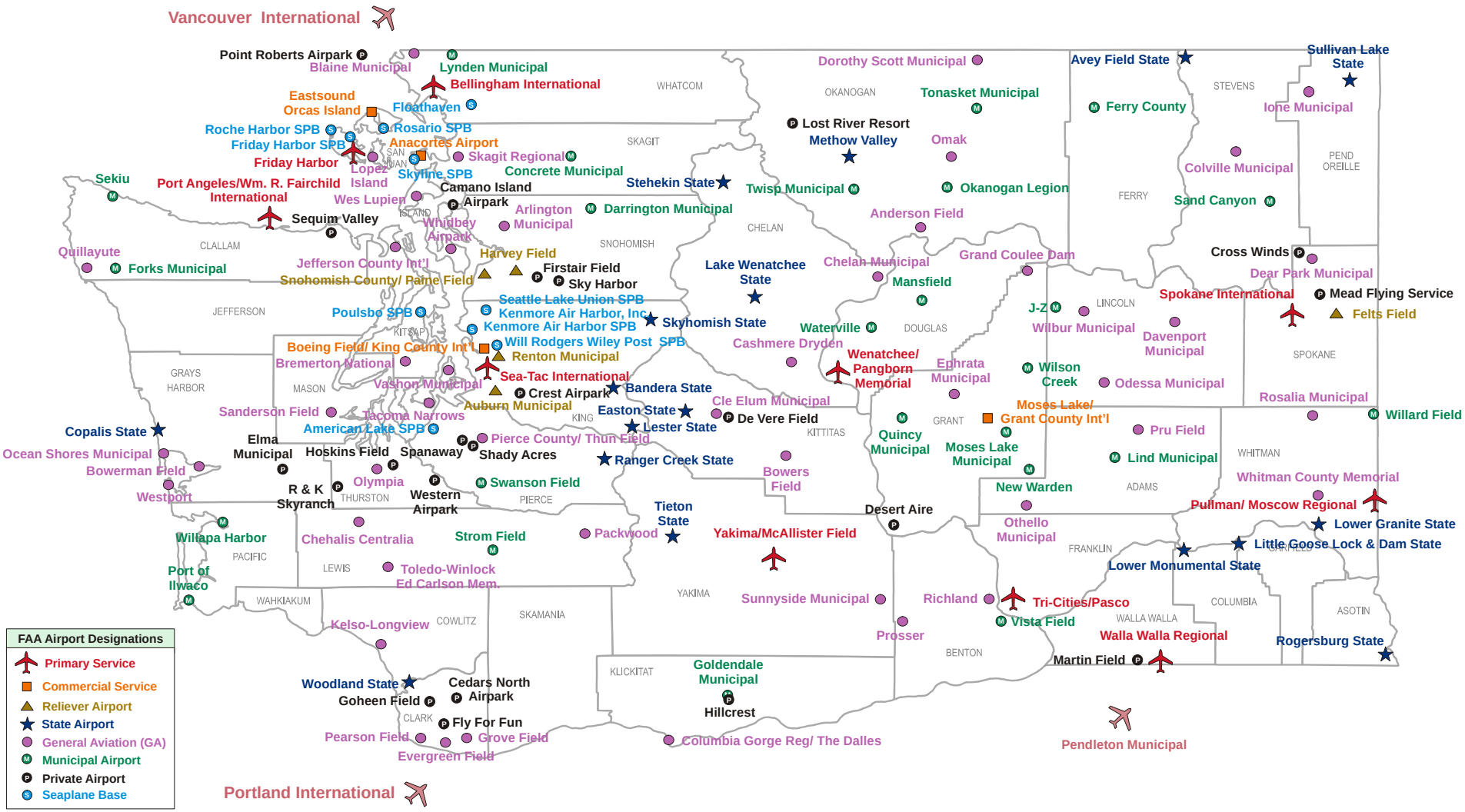
6. Airspace System Analysis

For safety and operational purposes, the FAA divides airspace into various classes designated for use by certain types of aircraft, taking into account the space that individual airports require for safe operations as well as the requirement to separate aircraft in transit between airports. Congestion occurs when volumes exceed available space resulting in delay and lower air transportation service levels. LATS includes an assessment of Washington State airspace to examine the overall airspace structure and the interaction of the airports within that space for the Special Emphasis Region, where the number of airports sharing airspace makes for complicated interactions.

A more detailed summary of airspace structure and how it relates to Washington State airspace in particular is included in the appendices.

In addition to the overall airspace used for navigation between airports, each individual airport must maintain approach and departure paths that are clear of obstructions in order to maximize operations. Within the ESSB districts there are several instances where the proximity of other facilities requires that airspace coordination or operational restrictions be imposed in order to maintain safety at both airports. These interactions are discussed in Part 4, starting with Figure 30.

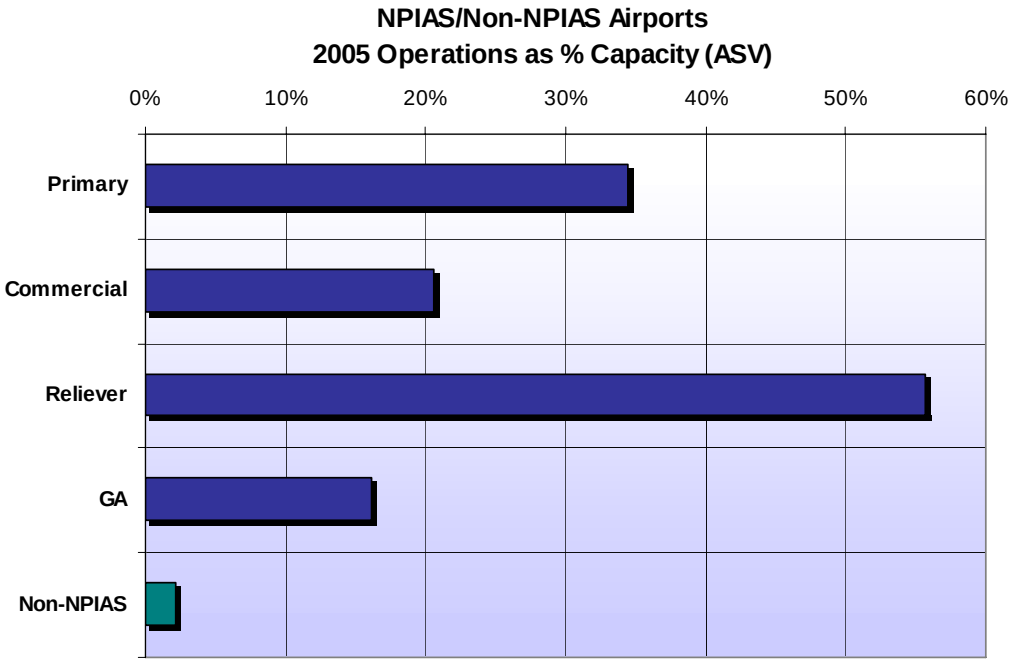
Figure 18: Washington Public Use Airport System



Aircraft Operations Capacity

Figure 19 shows the cumulative capacity of the airports by FAA airport class as measured by ASV. The data indicate that only the five NPIAS reliever airports in Washington are approaching 60 percent of their total operational capacity, which is the point where planning for additional capacity is normally recommended. Also shown is the percent of capacity currently being utilized at the 73 airports and seaplane bases that are included in the state system but are not part of the NPIAS.

Figure 19: Airport Capacity – NPIAS Airports



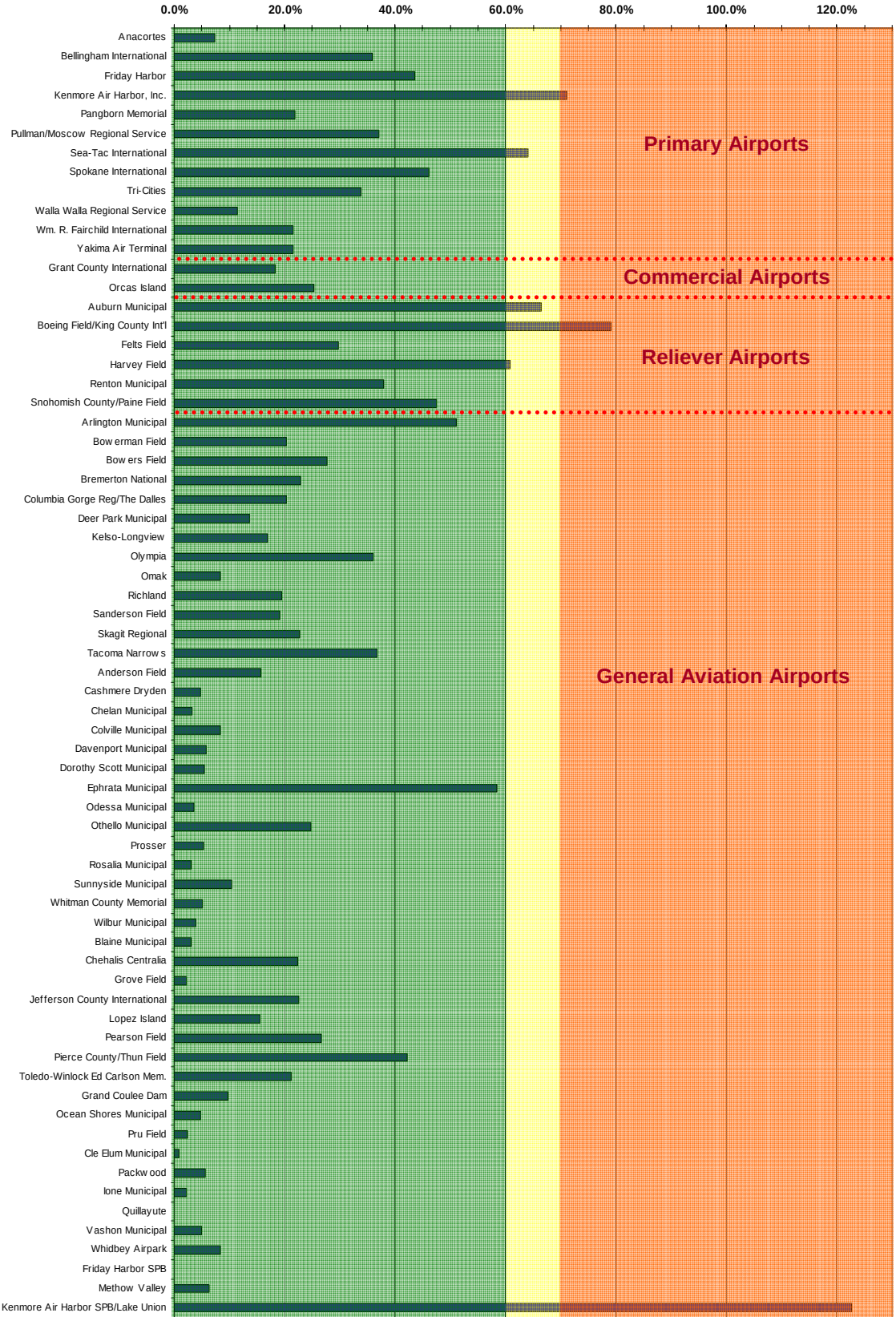
Key Highlights:

Only the five reliever airports are approaching 60 percent of their total operational capacity, the point where planning for additional capacity is normally recommended under FAA guidelines.

The capacity of each individual NPIAS airport was calculated and compared with operations levels recorded in 2005 to summarize statewide capacity. The details of this analysis are depicted in Figure 21 and are shown in a more detailed table in the appendices.

The data in Figure 20 show there are six individual airports where airfield capacity is an issue that will impact the system. Of these six, two are seaplane facilities operated by Kenmore Air and calculating capacity at a seaplane base is admittedly inexact. A third, Ephrata, is showing capacity issues based on current operations by sailplanes/gliders. This leaves the remaining capacity issues at facilities in the Puget Sound Region (Sea-Tac, Boeing Field/King County International, Auburn Municipal and Harvey Field). While some redistribution of activity could occur between airports in the region to balance overall operations levels for reliever and general aviation airports, this is less of a possibility for the Primary and Commercial Service airports which fulfill a public transportation function compared to private transport role of the smaller airports.

Figure 20: NPIAS Airports – 2005 Operations as a Percent of Capacity (ASV)



Key Highlights:

There are six individual airports where airfield capacity is an issue that will impact the system. This leaves the remaining capacity issues at facilities in the high volume Puget Sound Region (Sea-Tac, Boeing Field/King County International, Auburn Municipal and Harvey Field).

Supplementing the capacity of the NPIAS airports in Washington are 73 facilities that have not been included (Non-NPIAS Airports). Figure 21 shows the capacity vs. operations for these facilities.

Figure 21: Non-NPIAS Airports – 2005 Operations as a Percent of Capacity (ASV)
(Alphabetical Order)

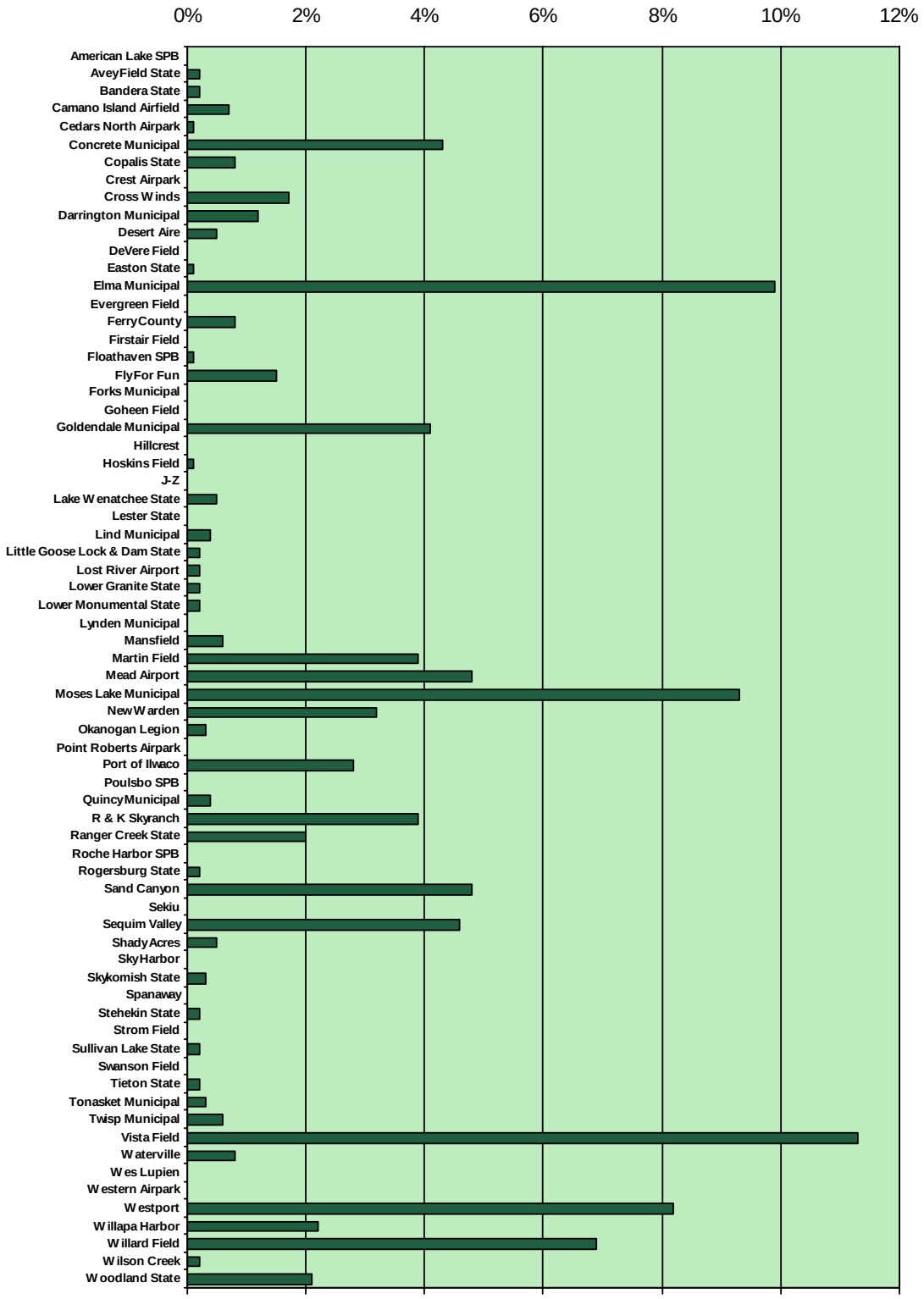


Figure 22: Aircraft Operations Capacity – Non-NPIAS Airports

Site ID.	Airport Name	NPIAS Role	WSDOT Role	2005 Ops	Annual Service Volume	2005 Operations as% of ASV	Reserve Capacity
26222.1A	Goldendale Municipal	None	Local Comm less than 10 A/C	5,000	120,750	4.1%	95.9%
26305.A	Moses Lake Municipal	None	Local Comm less than 10 A/C	21,500	230,000	9.3%	90.7%
26324.A	Okanogan Legion	None	Local Comm less than 10 A/C	310	120,750	0.3%	99.7%
26150.A	Sand Canyon	None	Local Comm less than 10 A/C	11,000	230,000	4.8%	95.2%
26438.A	Tonasket Municipal	None	Local Comm less than 10 A/C	800	230,000	0.3%	99.7%
26457.A	Waterville	None	Local Comm less than 10 A/C	1,000	120,750	0.8%	99.2%
26436.A	Willard Field	None	Local Comm less than 10 A/C	8,300	120,750	6.9%	93.1%
26167.A	Concrete Municipal	None	Local Comm less than 10 A/C	7,410	172,500	4.3%	95.7%
26384.12A	Ferry County	None	Local Comm more than 10 A/C	1,000	120,750	0.8%	99.2%
26273.A	Lind Municipal	None	Local Comm more than 10 A/C	500	120,750	0.4%	99.6%
26282.A	Mansfield	None	Local Comm more than 10 A/C	700	120,750	0.6%	99.4%
26454.A	New Warden	None	Local Comm more than 10 A/C	3,900	120,750	3.2%	96.8%
26376.83A	Quincy Municipal	None	Local Comm more than 10 A/C	500	120,750	0.4%	99.6%
26440.A	Twisp Municipal	None	Local Comm more than 10 A/C	1,400	230,000	0.6%	99.4%
26249.A	Vista Field	None	Local Comm more than 10 A/C	26,000	230,000	11.3%	88.7%
26463.A	Westport	None	Local Comm more than 10 A/C	9,900	120,750	8.2%	91.8%
26471.5*A	Wilson Creek	None	Local Comm more than 10 A/C	200	120,750	0.2%	99.8%
26180.A	Darrington Municipal	None	Local Comm more than 10 A/C	1,600	135,000	1.2%	98.8%
26213.A	Forks Municipal	None	Local Comm more than 10 A/C	NR	230,000	NC	NC
26240.A	Port of Ilwaco	None	Local Comm more than 10 A/C	4,800	172,500	2.8%	97.2%
26401.*A	Sekiu	None	Local Comm more than 10 A/C	NR	172,500	NC	NC
26304.8A	Strom Field	None	Local Comm more than 10 A/C	NR	172,500	NC	NC
26322.11A	Wes Lupien	None	Local Comm more than 10 A/C	NR	172,500	NC	NC
26412.A	Willapa Harbor	None	Local Comm more than 10 A/C	3,813	172,500	2.2%	97.8%
26267.4A	Avey Field State	None	Recreation/Remote	300	120,750	0.2%	99.8%
26104.A	Bandera State	None	Recreation/Remote	200	112,500	0.2%	99.8%
26424.3*A	Camano Island Airfield	None	Recreation/Remote	1,230	172,500	0.7%	99.3%
26104.11*A	Cedars North Airpark	None	Recreation/Remote	200	172,500	0.1%	99.9%
26170.A	Copalis State	None	Recreation/Remote	1,000	120,750	0.8%	99.2%
26252.1A	Crest Airpark	None	Recreation/Remote	NR	240,000	NC	NC
26157.*A	Cross Winds	None	Recreation/Remote	2,000	120,750	1.7%	98.3%
26290.9A	Desert Aire	None	Recreation/Remote	1,135	230,000	0.5%	99.5%
26159.1A	DeVere Field	None	Recreation/Remote	NR	172,500	NC	NC
26189.A	Easton State	None	Recreation/Remote	200	172,500	0.1%	99.9%
26196.A	Elma Municipal	None	Recreation/Remote	12,000	120,750	9.9%	90.1%
26441.1A	Evergreen Field	None	Recreation/Remote	NR	172,500	NC	NC
26304.21A	Firstair Field	None	Recreation/Remote	NR	150,000	NC	NC
26444.4A	Fly For Fun	None	Recreation/Remote	3,350	230,000	1.5%	98.5%
26104.1A	Goheen Field	None	Recreation/Remote	NR	172,500	NC	NC
26222.*A	Hillcrest	None	Recreation/Remote	30	120,750	0.0%	100.0%
26328.1*A	Hoskins Field	None	Recreation/Remote	140	172,500	0.1%	99.9%
26096.*A	J-Z	None	Recreation/Remote	50	120,750	0.0%	100.0%
26269.1A	Lake Wenatchee State	None	Recreation/Remote	600	120,750	0.5%	99.5%
26271.*U	Lester State	None	Recreation/Remote	Closed	Closed	NC	NC
26424.5A	Little Goose Lock & Dam State	None	Recreation/Remote	300	120,750	0.2%	99.8%
26291.6*A	Lost River Airport	None	Recreation/Remote	190	120,750	0.2%	99.8%

Site ID.	Airport Name	NPIAS Role	WSDOT Role	2005 Ops	Annual Service Volume	2005 Operations as% of ASV	Reserve Capacity
26162.1A	Lower Granite State	None	Recreation/Remote	300	120,750	0.2%	99.8%
26243.5A	Lower Monumental State	None	Recreation/Remote	300	120,750	0.2%	99.8%
26275.A	Lynden Municipal	None	Recreation/Remote	NR	172,500	NC	NC
26163.A	Martin Field	None	Recreation/Remote	4,700	120,750	3.9%	96.1%
26293.A	Mead Airport	None	Recreation/Remote	5,800	120,750	4.8%	95.2%
26354.*A	Point Roberts Airpark	None	Recreation/Remote	NR	172,500	NC	NC
26388.8*A	R & K Skyranch	None	Recreation/Remote	6,800	172,500	3.9%	96.1%
26230.A	Ranger Creek State	None	Recreation/Remote	2,050	105,000	2.0%	98.0%
26098.6*A	Rogersburg State	None	Recreation/Remote	300	120,750	0.2%	99.8%
26402.1A	Sequim Valley	None	Recreation/Remote	7,980	172,500	4.6%	95.4%
26414.1*A	Shady Acres	None	Recreation/Remote	600	120,750	0.5%	99.5%
26425.8*A	Sky Harbor	None	Recreation/Remote	NR	105,000	NC	NC
26409.A	Skykomish State	None	Recreation/Remote	300	112,500	0.3%	99.7%
26415.A	Spanaway	None	Recreation/Remote	NR	140,000	NC	NC
26425.A	Stehekin State	None	Recreation/Remote	250	120,750	0.2%	99.8%
26300.A	Sullivan Lake State	None	Recreation/Remote	300	120,750	0.2%	99.8%
26191.1A	Swanson Field	None	Recreation/Remote	NR	112,500	NC	NC
26386.6A	Tieton State	None	Recreation/Remote	300	120,750	0.2%	99.8%
26485.01A	Western Airpark	None	Recreation/Remote	NR	172,500	NC	NC
26478.1A	Woodland State	None	Recreation/Remote	3,600	172,500	2.1%	97.9%
26433.C	American Lake SPB	None	Seaplane Base	NR	230,000	NC	NC
26110.11C	Floathaven SPB	None	Seaplane Base	220	230,000	0.1%	99.9%
26365.C	Poulsbo SPB	None	Seaplane Base	NR	230,000	NC	NC
26388.63C	Roche Harbor SPB	None	Seaplane Base	NR	230,000	NC	NC
26389.4C	Rosario SPB	None	Seaplane Base	NR	230,000	NC	NC
26098.23C	Skyline SPB	None	Seaplane Base	NR	230,000	NC	NC
26381.01C	Will Rogers Wiley Post SPB	None	Seaplane Base	NR	60,000	NC	NC

Passenger Capacity

All of the 16[1] airports providing scheduled commercial passenger service within the state are included in the NPIAS as either primary or commercial service facilities. Based on data reported by Sea-Tac, 2005 passenger levels constitute 68 percent of the theoretical peak hour capacity of their terminal facility. The remaining Washington commercial airports either have no issues concerning terminal capacity or have not reported their terminal facilities. In some cases, such as Anacortes and Orcas Island commercial service is offered from private facilities. Although no peak hour capacities were reported for Kenmore Air Harbor SPB operations, the extremely low peak hour passenger demand would not be expected to place a significant burden on the facilities.

[1] FAA classifies 15 airports as commercial service, the state classification counts Kenmore Air Harbor as commercial service for a total of 16

At Anacortes and Kenmore Air Harbor passengers are processed through privately owned hangars. These facilities consist of a ticket counter, limited seating area and restrooms. The aircraft being used to serve the passengers are small piston powered aircraft with a seating capacity of fewer than nine seats. Therefore, the peak number of passengers within the terminal will be nine. Because of this low usage, these are seen as adequate for the passenger levels currently registered. When required, the private owners will expand them at their expense.

Figure 23: Statewide Airport Classifications: Passenger Capacity, 2005

Airport	Passenger Terminal Peak Hr Capacity	2005 Peak Hour Passengers	Capacity Utilization (%)	Reserve Capacity (%)
Anacortes	9	9	100%	0%
Bellingham International /1	149	30	20%	80%
Boeing Field/King County International	160	7	4%	96%
Friday Harbor	22	8	37%	63%
Grant County International	132	15	11%	89%
Orcas Island	7	7	100%	0%
Kenmore Air Harbor SPB	8	8	100%	0%
Kenmore Air Harbor Inc. /SPB Lake Union	8	8	100%	0%
Pangborn Memorial	89	30	34%	66%
Pullman/Moscow Regional	51	30	59%	41%
Seattle-Tacoma International	8,065	5,500	68%	32%
Spokane International	2,205	746	34%	66%
Tri-Cities	271	185	68%	32%
Walla Walla Regional	206	30	15%	85%
William R. Fairchild International	29	7	24%	76%
Yakima Air Terminal	176	30	17%	83%

Note: Kenmore Air Harbor is counted as two commercial service facilities according to the proposed State Airport Classifications; commercial schedule service is offered at two facilities – Lake Union and Lake Washington. /1 As of 2006, Bellingham has increased its large jet service (130-150 seat MD83/87s) operations which have resulted in a much higher utilization of the airport terminal at peak hour – approximately 80 percent capacity.

Key Highlights:

Sea-Tac passenger levels constitute 68 percent of the theoretical peak hour capacity of their terminal facility. With the exception of Bellingham International, the remaining airports have no current issues concerning terminal capacity.

Cargo Capacity

All airports where cargo activity has been reported are included in the NPIAS. Like other categories, cargo demand within the state is concentrated in the Puget Sound Region while capacity is available at numerous airports outside the region. In fact, many of the state's airports reported the existence of large apron areas available for cargo operation but no current activity. Of the airports reporting cargo volume, Boeing Field/King County International has registered the highest level of enplaned tonnage. While handling the greatest cargo volumes of any airports evaluated under this study, Boeing Field/King County International and Sea-Tac are also the two most constrained airports in Washington State relative to reserve capacity available to accommodate future cargo growth. By contrast, Spokane International has approximately 99 percent of its capacity available and Skagit Regional Airport has more than 80 percent of its cargo capacity available.

A large portion of cargo volume operates as unscheduled activity and most airports have limited access to cargo volume information. USDOT provides limited information on cargo volume from carrier filings. Cargo carriers are sensitive to disclosing information for competitive reasons. Airports are able to document cargo operations/service so estimates can be developed, however cargo volume can vary greatly by direction within many markets.

Figure 24: Cargo Capacity in Washington

Airport	Total 2005 Enplaned Cargo (in tons)	Estimated Cargo Building Capacity (in tons)	Capacity Utilization (%)	Reserve Capacity (%)
Boeing Field/King County Int'l [1]	471,000	600,000	79%	21%
Seattle-Tacoma International	338,657	590,000	58%	42%
Spokane International	55,347	4,280,000	1%	99%
Skagit Regional	1,060	6,000	18%	82%

[1] Calculated based on dedicated apron and aircraft type rather than building size since cargo is processed off airport (ratio = 20 tons/sf/yr)

Key Highlight:

Like other categories, cargo demand and cargo airline service within the state is concentrated in the Puget Sound Region while capacity is available at numerous airports outside the region.

Aircraft Storage and Parking Capacity

Nearly half of the state's aircraft are based in the Puget Sound Region. Although the region also has almost half of the state's aircraft storage capacity, it is approaching its existing capacity with only 664 aircraft storage positions remaining available for future use. Within the Puget Sound Region, there are 1,645 aircraft tie-downs and 2,628 hangars, resulting in a total inventory of 4,360 storage positions. This represents a mix of 38 percent tie-downs and 62 percent hangars providing storage capacity for based and transient aircraft.

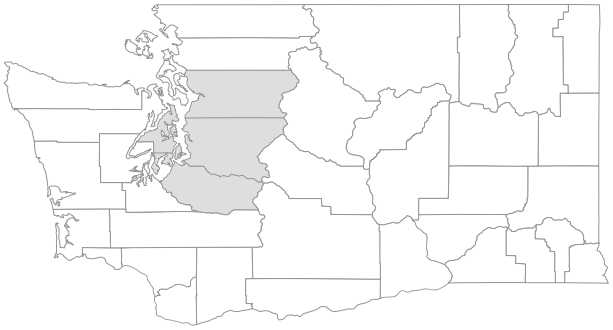
What is the Existing Capacity of the Four Special Emphasis Regions?

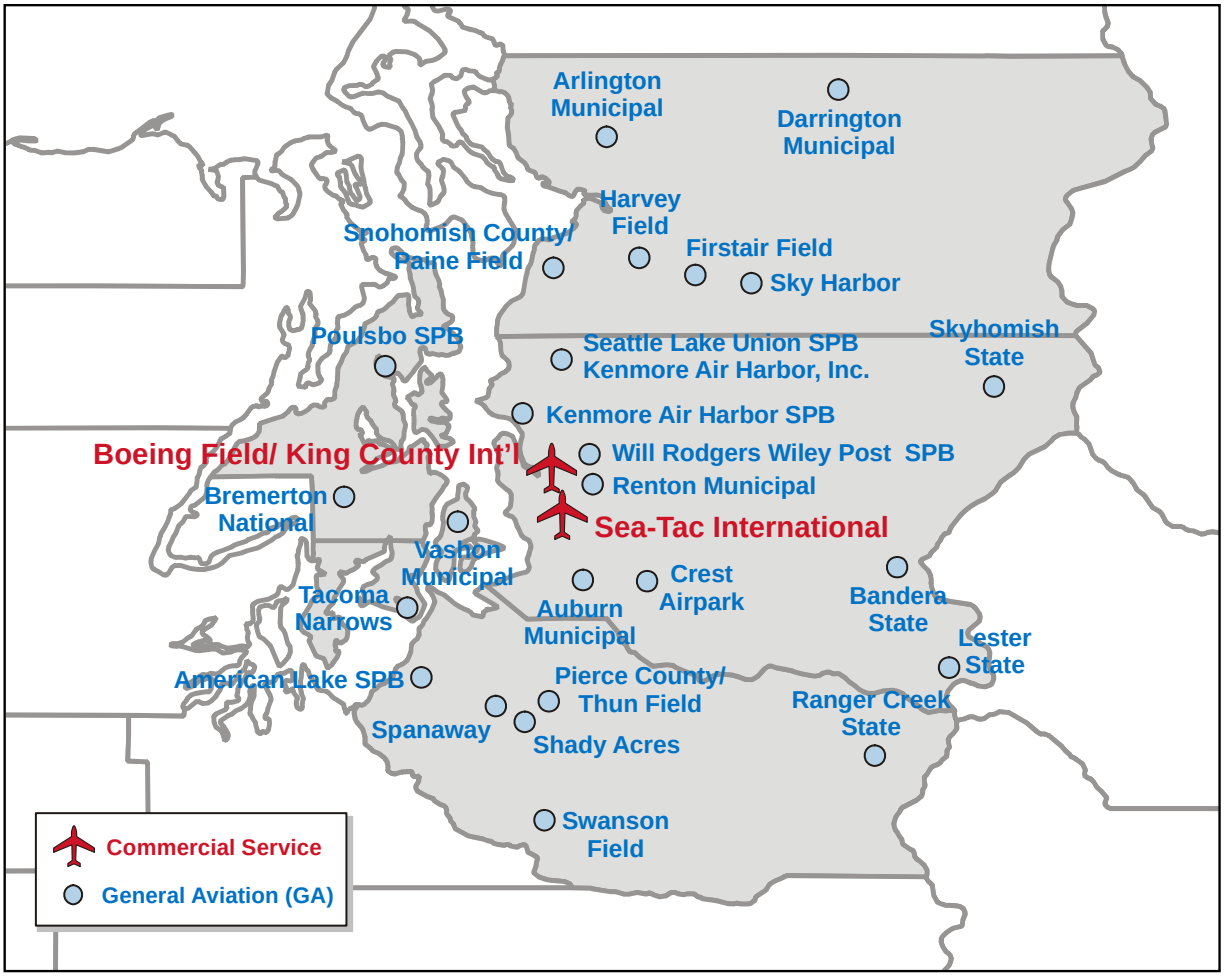
Per direction of the legislature, LATS provides a detailed capacity assessment for four Special Emphasis Regions in the state: Puget Sound, Southwest Washington, Spokane and Tri-Cities. Findings for each region are provided below.

Puget Sound Region

The Puget Sound Region represents the most populated region in Washington State and the busiest aviation area. It has also been identified as one of the ESSB 5121 Special Emphasis Regions. The region identified encompasses King, Snohomish, Pierce, and Kitsap Counties. This is the same area as the PSRC RTPO district. The PSRC has been active in airport planning and development issues for the 25 airports within their region as shown and listed below.

Figure 25: Puget Sound Region





Puget Sound Regional Council (PSRC) RTPO District Airports:

1. American Lake SPB
2. Arlington Municipal
3. Auburn Municipal
4. Bandera State
5. Bremerton National
6. Crest Airpark
7. Darrington Municipal
8. Firstair Field
9. Harvey Field
10. Kenmore Air Harbor SPB
11. Boeing Field/King County International
12. Lester State
13. Pierce County/Thun Field
14. Poulsbo SPB
15. Ranger Creek State
16. Renton Municipal
17. Seattle Lake Union SPB/Kenmore Air Harbor, Inc.
18. Seattle-Tacoma International
19. Shady Acres
20. Sky Harbor
21. Skykomish State
22. Snohomish County/Paine Field
23. Spanaway
24. Swanson Field
25. Tacoma Narrows
26. Vashon Municipal
27. Will Rogers-Wiley Post SPB

Puget Sound Passenger Capacity

Of the three airports providing scheduled commercial passenger service within the Puget Sound Region Special Emphasis Regions, Seattle-Tacoma International Airport is clearly the driving force in passenger activity. Based on data reported by Sea-Tac, 2005 passenger levels constitute 68 percent of the theoretical peak hour capacity of the airport. Boeing Field/King County International Airport only experiences a small fraction of its peak hour passenger capacity, and although no peak hour capacity was reported for Kenmore Air Harbor SPB, the extremely low peak hour passenger demand would not be expected to place a significant burden on its facilities.

Figure 26: Passenger Capacity in Puget Sound Region

Airport	Passenger Terminal Peak Hr Capacity	2005 Peak Hour Passengers	Capacity Utilization (%)	Reserve Capacity (%)
Boeing Field/King County Int'l	160	7	4%	96%
Kenmore Air Harbor SPB/Lake Union	8	8	100%	0
Kenmore Air Harbor SPB	8	8	100%	0
Seattle-Tacoma International	8,065	5,500	68%	32%
Total:	**8,225**	**5,515**	**67%**	**33%**

Key Highlight:

Seattle-Tacoma International Airport is clearly the driving force in passenger activity. Based on data reported by Sea-Tac, 2005 passenger levels constitute 68 percent of the theoretical peak hour capacity of the airport.

Puget Sound Cargo Capacity

Cargo capacity within the Puget Sound Region Special Emphasis Regions is evenly distributed between Boeing Field/King County International and Seattle-Tacoma International Airports. Boeing Field/King County International reports the greater enplaned tonnage of the two facilities, and at 21 percent, has one-half of the reserve cargo capacity of Sea-Tac. While handling the greatest cargo volumes of any airports evaluated under this study, Boeing Field/King County International and Sea-Tac are also the two most constrained airports in Washington State relative to reserve capacity available to accommodate future cargo growth.

Figure 27: Cargo Capacity in Puget Sound Region

Airport	Total 2005 Enplaned Cargo (in tons)	Estimated Cargo Building Capacity (in tons)	Capacity Utilization (%)	Reserve Capacity (%)
Boeing Field/King County Int'l [1]	471,000	600,000	79%	21%
Seattle-Tacoma Int'l	338,657	590,000	58%	42%
Tacoma Narrows	12	Not Reported	Not Reported	Not Reported
Total:	**809,669**	**1,190,000**	**68%**	**32%**

Key Highlight:

Boeing Field/King County International has the most enplaned cargo tonnage in the Puget Sound and is operating at almost 80 percent capacity.

Puget Sound Aircraft Storage and Parking Capacity

Almost half of the state's aircraft are based in the Puget Sound Region. Although the region also has nearly half of the state's aircraft storage capacity, it is approaching capacity with only 664 aircraft positions available as either a tie-down or hangar. There are 1,645 aircraft tie-downs and 2,628 hangars for a total inventory of 4,360 storage positions in the region[2]. This represents a mixture of 38 percent tie-downs and 62 percent hangars providing storage capacity for based and transient aircraft.

As illustrated in Figure 28, Crest Airpark, Kenmore Air Harbor SPB, and Renton Municipal have reached their existing aircraft storage capacity whereas a number of airports have reached over 80 percent capacity. These airports include Arlington Municipal, Boeing Field/King County International, Firstair Field, Harvey Field and Shady Acres. Several seaplane base airports and state owned airports have few or no based aircraft and are not approaching capacity. These airports include American Lake SPB, Bandera State, Kenmore Air Harbor, Inc., Lester State, Poulsbo SPB, Ranger Creek State, Sky Harbor, Skykomish State, and Will Rogers Wiley Post SPB. Although the split between the number of hangars and tie-downs in the Puget Sound Region is 62 percent verses 38 percent, demand for hangars at most airports is far greater than tie-downs. The ratio of the number of hangars to tie-downs is roughly 5:1 at Arlington Municipal, Harvey Field and 9:1 at Vashon Municipal. The ratio is about 3:1 at Firstair Field and Spanaway. Airports with significantly more tie-downs than hangars include Darrington Municipal, Shady Acres, and Tacoma Narrows.

[2] Several hangars accommodate multiple aircraft

Figure 28: Aircraft Storage and Parking Capacity in Puget Sound Region

Airport	2005 Based Aircraft	Total Tie-downs	Total Hangars	Total Aircraft Capacity	Reserve Capacity	Storage Capacity Utilization (%)
American Lake SPB	0	0	0	0	0	0
Arlington Municipal	592	111	514	625	33	95
Auburn Municipal	276	155	234	389	113	71
Bandera State	0	0	0	0	0	0
Boeing Field/King County International	447	220	259	479	32	93
Bremerton National	196	88	160	248	52	79
Crest Airpark	325	165	160	325	0	100
Darrington Municipal	7	16	2	18	11	39
Firstair Field	70	25	62	87	17	81
Harvey Field^1	326	55	254	345	19	95
Kenmore Air Harbor SPB	70	70	0	70	0	100
Kenmore Air Harbor, Inc.	0	0	0	0	0	0
Lester State	0	0	0	0	0	0
Pierce County/Thun Field	230	130	163	293	63	79
Poulsbo SPB	0	0	0	0	0	0
Ranger Creek State	0	0	0	0	0	0
Renton Municipal^2	290	135	112	290	0	100
Sea-Tac International^3	12	0	4	12	0	100
Shady Acres	35	25	11	36	1	97
Sky Harbor	0	0	0	0	0	0
Skykomish State	0	8	0	8	8	0
Snohomish County/Paine Field	571	255	495	750	179	76
Spanaway	30	20	52	72	42	42
Swanson Field	18	18	15	33	15	55
Tacoma Narrows	171	144	86	230	59	74
Vashon Municipal	30	5	45	50	20	60
Will Rogers Wiley Post SPB	0	0	0	0	0	0
Total in Region	**3,696**	**1,645**	**2,628**	**4,360**	**664**	**85**

^1 18 hangars accommodate up to 3 aircraft each which accounts for increase in total aircraft capacity.
^2 Several hangars accommodate multiple aircraft.
^3 Aircraft at air-carrier airports generally park at gates or remote overnight parking areas and do not utilize tie-downs or hangars. Facility appears to have additional aircraft capacity.

Key Highlight:

Capacity for the region is averaging 85 percent utilization rate. Reserve capacity within the region is on average 15 percent. Many airports have reached over 80 percent capacity.

Puget Sound Aircraft Operations Capacity

Given the special emphasis of the Puget Sound Region under ESSB 5121, a more comprehensive analysis was prepared of operations demand and capacity by individual airport. Presented in Figure 29 are those airports falling within the Puget Sound Region as delineated in the Special Emphasis Regions. In the table, each airport's Service Classification as currently identified under the state system is presented along with its 2005 operations, the airport's calculated Annual Service Volume (operations capacity), the percentage of operations capacity represented by 2005 activity levels and the remaining reserve capacity available.

In some instances, the smaller unattended Recreation/Remote airports and Seaplane Bases did not have 2005 operations data available. Although these airports contribute capacity to the region, their available capacity could not be calculated and therefore was not included in overall calculation of aggregate capacity in the region. Given that these facilities are extremely low operation airports their impact on regional capacity calculations is negligible.

Figure 29: Aircraft Operations Capacity in Puget Sound Region

	State Service Classification[1]	2005 Demand[1]	Operations Capacity[1]	Percent Utilization[1]	Reserve Capacity[1]
Boeing Field/King County Int'l	Commercial Service	300,478	380,000	79.1%	20.9%
Kenmore Air Harbor, Inc.	Commercial Service	40,000	56,250	71.1%	28.9%
Seattle-Tacoma Int'l	Commercial Service	341,471	533,041	64.1%	35.9%
Subtotal by Service Class		681,949	969,291	70.4%	29.6%
Arlington Municipal	Regional Service	137,737	270,000	51.0%	49.0%
Auburn Municipal	Regional Service	153,618	231,000	66.5%	33.5%
Bremerton National	Regional Service	55,000	240,000	22.9%	77.1%
Harvey Field	Regional Service	139,859	230,000	60.8%	39.2%
Renton Municipal	Regional Service	87,226	230,000	37.9%	62.1%
Snohomish County /Paine Field	Regional Service	150,220	316,218	47.5%	52.5%
Tacoma Narrows	Regional Service	88,423	240,000	36.8%	63.2%
Subtotal by Service Class		812,083	1,757,218	46.2%	53.8%
Pierce County/Thun Field	Local Comm more than 10 A/C	90,000	213,200	42.2%	57.8%
Subtotal by Service Class		90,000	213,200	42.2%	57.8%
Darrington Municipal	Local Comm more than 10 A/C	1,600	135,000	1.2%	98.8%
Subtotal by Service Class		1,600	135,000	1.2%	98.8%
Lester State	Recreation/Remote	Closed	Closed	--	--
Shady Acres	Recreation/Remote	600	120,750	0.5%	99.5%
Bandera State	Recreation/Remote	200	112,500	0.2%	99.8%
Crest Airpark	Recreation/Remote	99,000	240,000	41.3%	58.8%
Firstair Field	Recreation/Remote	18,169	150,000	12.1%	87.9%
Ranger Creek State	Recreation/Remote	2,050	105,000	2.0%	98.0%
Sky Harbor	Recreation/Remote	1,000	105,000	1.0%	99.0%
Skykomish State	Recreation/Remote	300	112,500	0.3%	99.7%
Spanaway	Recreation/Remote	19,000	140,000	13.6%	86.4%
Swanson Field	Recreation/Remote	6,015	112,500	5.3%	94.7%
Vashon Municipal	Recreation/Remote	6,000	120,000	5.0%	95.0%
Subtotal by Service Class		152,334	1,318,250	11.6%	88.4%
American Lake SPB	Seaplane Base	50	230,000	0.0%	100.0%
Kenmore Air Harbor SPB/Lake Union	Seaplane Base	73,600	60,000	122.7%	-22.7%
Poulsbo SPB	Seaplane Base	275	230,000	0.1%	99.9%
Will Rogers Wiley Post SPB	Seaplane Base	See Note[2]	60,000	Not Calculated	Not Calculated
Subtotal by Service Class		73,925	580,000	12.7%	87.3%
Total by Region		1,811,891	4,972,959	36.4%	63.6%

Note: 1 Service Class Subtotals and Region Total do not include airports for which no data is available.
2 Wiley Post SPB operations aggregated with and reported under Renton Municipal Airport

Key Highlights:

Overall, capacity is a little more than one-third utilized, however, at the commercial and regional service airports the utilization averages 70 and 46 percent respectively.

The three Commercial Service facilities in the Puget Sound Region have minimal reserve operations capacity available. Typical FAA planning guidelines suggest that airports initiate planning for capacity improvements when activity levels reach 60 percent of capacity, with improvements in place and operational by the time the airport reaches 70 percent of capacity.

While activity levels can continue to grow in the absence of capacity improvements, operational delays will occur causing inconvenience and increased costs to passengers and airline operators. Two of Region's Regional Service airports, Auburn Municipal and Harvey Field, have also reached the FAA's 60 percent threshold for planning capacity improvements.

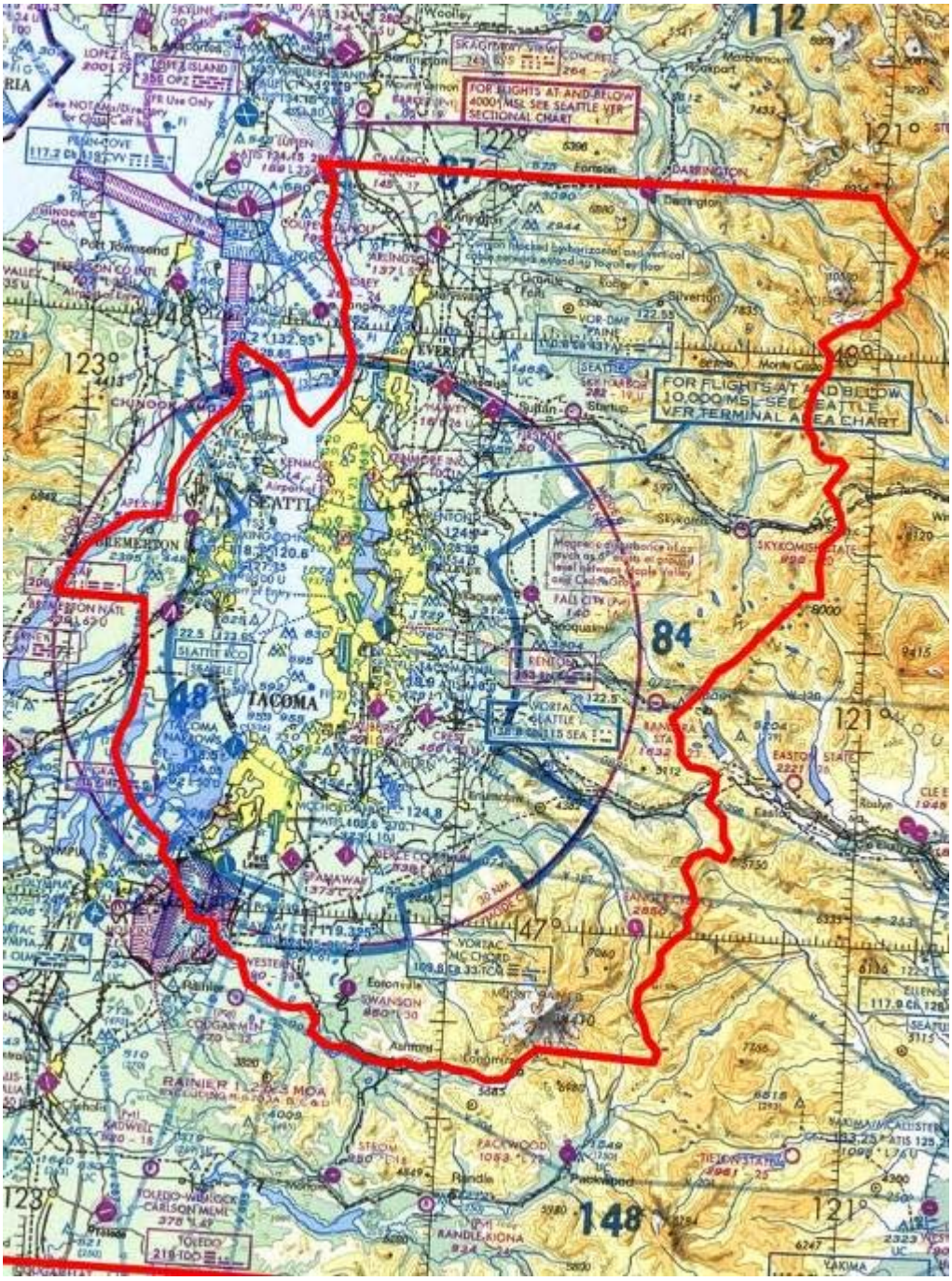
While some redistribution of demand activity may occur between airports in the Region to balance overall operations levels among Regional Service, Community and Recreation/Remote airports, this is less of a possibility for the Commercial Service airports which is driven by airline service levels and market demand.

Puget Sound Airspace

As described earlier, airspace interaction in the Puget Sound Region is dominated by the Class B airspace associated with the Seattle-Tacoma International Airport (See Figure 30). Within this area the primary interaction is the sharing of space by Seattle-Tacoma International Airport (Sea-Tac) and Boeing Field/King County International Airport. Boeing Field/King County International Airport is 5.7 nautical miles north of Sea-Tac, directly under the final approach course for runway 16C. This makes the airspace interaction between the two airports very complex. Air traffic controllers must provide at least one type of separation (vertical, lateral, and visual) to all aircraft under their guidance. Due to the complexities between the two airports, there are procedures in place that minimize potential delay. For example, when Sea-Tac and Boeing Field/King County International Airport are in south flow (weather permitting), "plan alpha" is employed. When plan alpha is in effect, the Boeing Field/King County International Airport tower has the responsibility of applying visual separation between Sea-Tac arrivals on a final approach and Boeing Field/King County International Airport traffic. In this scenario, Boeing Field/King County International Airport air traffic controllers must be able to visually see the aircraft to determine separation. When Sea-Tac and Boeing Field/King County International Airport are in south flow and weather does not permit "plan alpha," Sea-Tac arrivals revert to Sea-Tac Terminal Radar Approach Control (TRACON); whereby, a controller is

dedicated to the arrival-radar monitor and utilizes concurrent Instrument Landing System (ILS) operational procedures. The least desirable scenario is when Sea-Tac and Boeing Field/King County International Airport are in north flow and "plan alpha" cannot be employed, resulting in the occurrence of significant delays. When the condition of significant delays occur, SEA TRACON treats Sea-Tac and Boeing Field/King County International Airport as a single airport and efficiencies are impacted. Much of this is because the separation of Boeing Field/King County International Airport arrivals and Sea-Tac departures are complicated by missed-approach procedures for the Boeing Field/King County International Airport arrivals. In this situation, Sea-Tac departures must initiate takeoff rolls before the Boeing Field/King County International Airport arrivals cross a specified intersection (7.6 nautical miles from Boeing Field/King County International Airport), otherwise the Sea-Tac departure must be held until the Boeing Field/King County International Airport arrival lands. The most volatile scenario is a split flow; whereby, Boeing Field/King County International Airport traffic is opposite that of Sea-Tac, and "plan alpha" cannot be used. Although weather conditions that necessitate this configuration are rare, when they occur, especially during peak departure periods at Sea-Tac, significant delays rapidly cumulate.

Figure 30: Puget Sound Airspace



Puget Sound Undeveloped Land Capacity

The Puget Sound Region has 1,769 acres of undeveloped airport land and accounts for approximately 16 percent of the total undeveloped airport land in Washington State. Twelve out of the 27 airports either have no land capacity or have not provided land capacity information. About 36 percent (636 of the 1,769) of the available acres are located at Bremerton National Airport.

Figure 31: Undeveloped Land Capacity in Puget Sound Region

Airport	Undeveloped Land (acres)
American Lake SPB	0
Arlington Municipal	190
Auburn Municipal	23
Bandera State	15
Boeing Field/King County International	0
Bremerton National	636
Crest Airpark	25
Darrington Municipal	20
Firstair Field	0
Harvey Field	125
Kenmore Air Harbor SPB	0
Kenmore Air Harbor, Inc.	0
Lester State	41
Pierce County/Thun Field	25
Poulsbo SPB	0
Ranger Creek State	10
Renton Municipal	2
Sea-Tac International	250
Shady Acres	0
Sky Harbor	0
Skykomish State	20
Snohomish County/Paine Field	267
Spanaway	0
Swanson Field	0
Tacoma Narrows	120
Vashon Municipal	0
Will Rogers Wiley Post SPB	0
Total	**1,769**

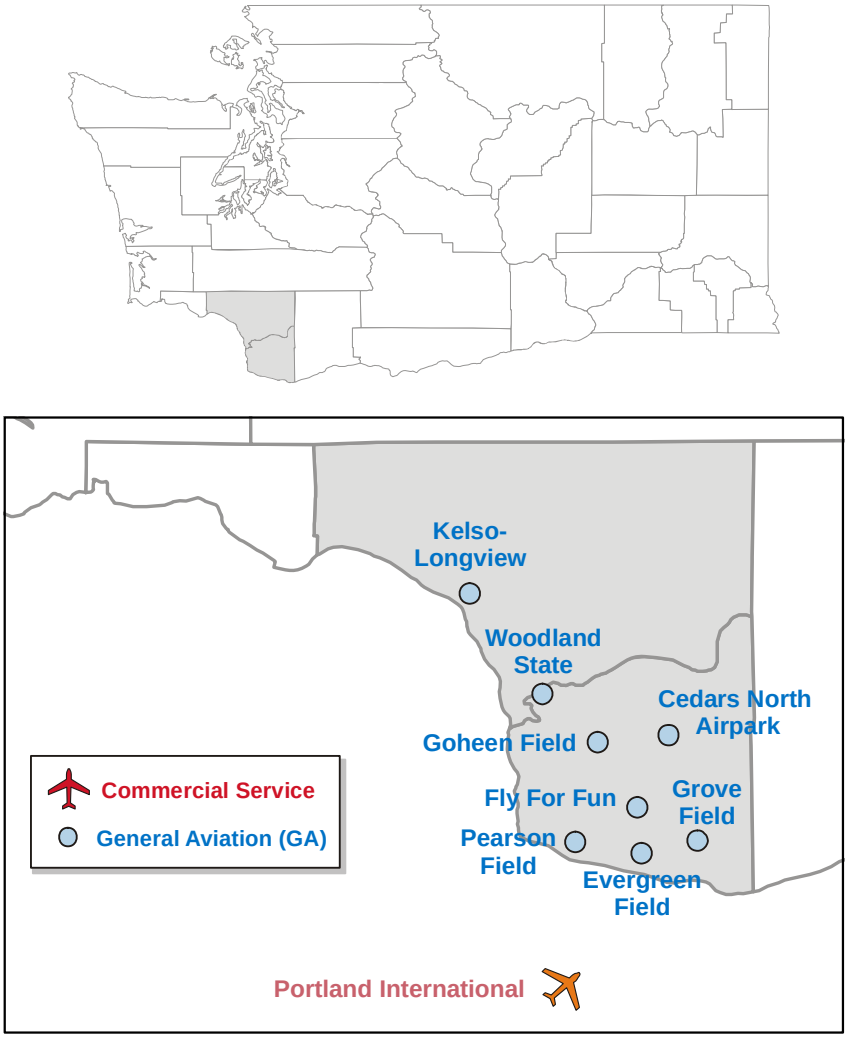
Key Highlight:

About 36 percent (636 of the 1,769) of the available acres are located at Bremerton National Airport.

Southwest Region

The Southwest Region identified in ESSB 5121 encompasses Cowlitz and Clark Counties and includes seven airports.

Figure 32: Southwest Region



Capacity and demand within the Southwest Region is complicated by the fact that the dominant airport for the region is located in another state. The Portland International Airport (PDX) is just south of the region, across the Columbia River. Although separated from Washington by the river and a political boundary, Portland International Airport provides all passenger and cargo service for the region. Additionally, general aviation demand and capacity are influenced by the three active GA facilities located within the state of Oregon and controlled by the Port of Portland that provide capacity for GA growth in this region. This is particularly true in light of the diminished GA capacity in recent years as private airports have closed in the region.

However, this analysis only measures the demand and capacity that have been identified as being within the region and therefore, measurable with our survey data.

Southwest Region Passenger Capacity

There is no scheduled commercial passenger service for airports within the Southwest Region Special Emphasis Regions. Given its proximity to Portland International Airport, and t a lesser extent Sea-Tac, the SW Region's Commercial air service needs are adequately served.

Southwest Region Cargo Capacity

No cargo service or cargo tonnages were reported for airports within the Southwest Region Special Emphasis Regions.

There are 397 hangars and 262 tie-downs in the Southwest Washington Region for a total inventory of 706 aircraft storage positions. This results in approximately 37 percent of tie-downs and 63 percent of hangars providing storage capacity for based and transient aircraft. With 469 based aircraft in the region, the airport system has 237 aircraft storage positions to handle additional based aircraft. Nonetheless, Cedars North Airpark has reached its existing aircraft storage capacity. Pearson Field only has one aircraft storage position remaining available. About 42 percent of the aircraft storage exists at Evergreen Field, while Kelso-Longview, Goheen Field and Grove Field still have some capacity to handle additional based or transient aircraft.

Demand for hangars at Grove Field and Pearson Field is far greater than tie-downs. The ratio of the number of hangars to tie-downs is roughly 6:1 and 7:1 respectively. On the other hand, at Evergreen Field the number of tie-downs out numbered hangars by 2:1. There are also 75 percent and 40 percent more tie downs than hanger positions respectively at Fly-for-Fun

and Kelso-Longview. Phase II will evaluate in more detail the impact of the Evergreen Field closure on capacity in Southwest Washington.

Figure 33: Aircraft Storage and Parking Capacity in Southwest Region

Airport	2005 Based Aircraft	Total Tie-downs	Total Hangars	Total Aircraft Capacity	Reserve Capacity	Storage Capacity Utilization (%)
Cedars North Airpark^1	6	0	3	6	0	100%
Evergreen Field	60	105	54	159	99	38%
Fly For Fun^2	9	7	1	11	2	82%
Goheen Field^3	50	20	26	87	37	58%
Grove Field	67	13	80	93	26	72%
Kelso-Longview	85	90	64	154	69	55%
Pearson Field	175	22	154	176	1	99%
Woodland State	17	5	15	20	3	85%
Total in Region	**469**	**262**	**397**	**706**	**237**	**37%**

^1 Each hangar accommodates up to 2 aircraft.
^2 Hangar accommodates 4 aircraft.
^3 21 hangars can accommodate 2 aircraft and 5 hangars can accommodate up to 5 aircraft.

Key Highlight:

With 469 based aircraft in the region, the airport system has 237 aircraft reserve capacity to handle additional based aircraft.

Southwest Region Aircraft Operations Capacity

The operations levels and available capacity for the Southwest Region, as delineated under ESSB 5121, is presented in Figure 34. The SW regions close proximity to the Portland metropolitan area airports including Portland International, Portland-Hillsboro, Portland Troutdale, and Portland-Mulino Airports limits aviation activity at Washington airports primarily to GA recreational flying because of the competitive airport market. As readily apparent from Figure 34, there is ample reserve capacity available at Southwest Region airports.

Figure 34: Aircraft Operations Capacity in Southwest Region

	State Service Classification[1]	2005 Demand[1]	Operations Capacity[1]	Capacity Used[1]	Reserve Capacity[1]
Kelso-Longview	Regional Service	38,850	230,000	16.9%	83.1%
Subtotal by Service Class		38,850	230,000	16.9%	83.1%
Grove Field	Local Comm less than 10 A/C	5,000	230,000	2.2%	97.8%
Pearson Field	Local Comm less than 10 A/C	48,120	180,000	26.7%	73.3%
Subtotal by Service Class		53,120	410,000	13.0%	87.0%
Cedars North Airpark	Recreation/Remote	200	172,500	0.1%	99.9%
Evergreen Field	Recreation/Remote	Not Reported	172,500	Not Calculated	Not Calculated
Fly For Fun	Recreation/Remote	3,350	230,000	1.5%	98.5%
Goheen Field	Recreation/Remote	Not Reported	172,500	Not Calculated	Not Calculated
Woodland State	Recreation/Remote	3,600	172,500	2.1%	97.9%
Subtotal by Service Class		7,150	575,000	1.2%	98.8%
Total by Region		99,120	1,215,000	8.2%	91.8%

/1 Service Class Subtotals and Region Total do not include airports for which no data is available.

Key Highlights:

There is ample reserve capacity available at Southwest Region airports. There are no commercial service airports in Southwest Region.

Southwest Region Airspace

The existing airspace structure and air traffic control (ATC) facilities serving the Southwest Region and the Portland International Airport (PDX) air traffic area are discussed in the following text and depicted in Figure 35.

Pearson Field is under the significant influence and control of FAA air traffic control located at Portland International Airport. Portland International Airport is a large, commercial airport located approximately three nautical miles to the southeast of Pearson Field in Oregon, with its own positive controlled airspace. Airspace surrounding Portland is classified as Class C airspace and is of large enough size and dimension to extend into Clark County. Portland airspace is segmented and differentiated to accommodate the operations of Pearson Field. Instead of the airspace starting at the surface, as it does elsewhere in the circle, it starts at 1,100 feet over Pearson to allow for its operations to occur outside the limits of this airspace. The second circular area is 20 nautical miles in diameter and starts at different elevations depending upon the segment

location within the 20 nautical mile area. These elevations vary from 1,100 feet over Pearson Field, to 1,700, 1,800, 2,000, or 2,300 feet at specified locations within the circle. The air traffic control aspects of this airspace are that pilots must contact Portland International Airport approach or departure control prior to arrival into the Portland International Airport Class C airspace, or shortly after departing Pearson (or Evergreen) airport(s). The primary purposes of these controls are for traffic and wake turbulence advisories. Additionally, "positive air traffic control" is provided by controllers in the regional Air Route Traffic Control Center (ARTCC). The ARTCC jurisdiction that Pearson Field comes under is the Seattle Center located in Auburn, Washington. If aircraft enroute to or from Pearson wish the services of positive control along the route of their flight, they contact Seattle Center.

Figure 35: Southwest Airspace

Southwest Region Undeveloped Land Capacity

The Southwest Washington Region has a total of 114 acres of undeveloped land at area airports. About 66 percent (75 of 114) comes from Cedars North Airpark and Goheen Field. Of the eight airports, two either have no land capacity or have not provided land information in the undeveloped land inventory database survey. Pearson Field and Woodland State have some undeveloped land; however, it is questionable whether it is useable land due to grading and floodplain issues.

Figure 36: Undeveloped Land Capacity in Southwest Region

Airport	Undeveloped Land (acres)
Cedars North Airpark	35
Evergreen Field	0
Fly For Fun	8
Goheen Field	40
Grove Field	0
Kelso-Longview	20
Pearson Field	6
Woodland State	5
Total	**114**

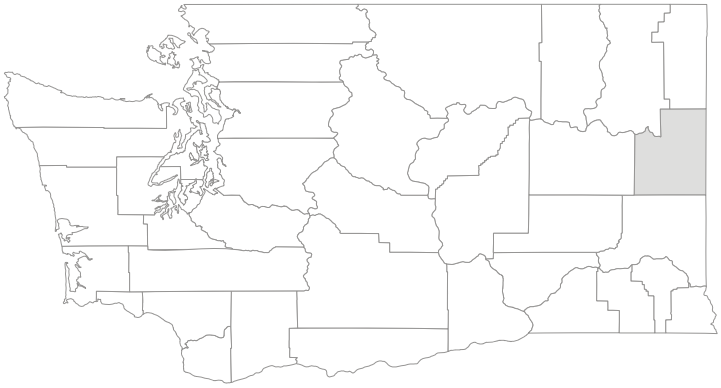
Key Highlight:

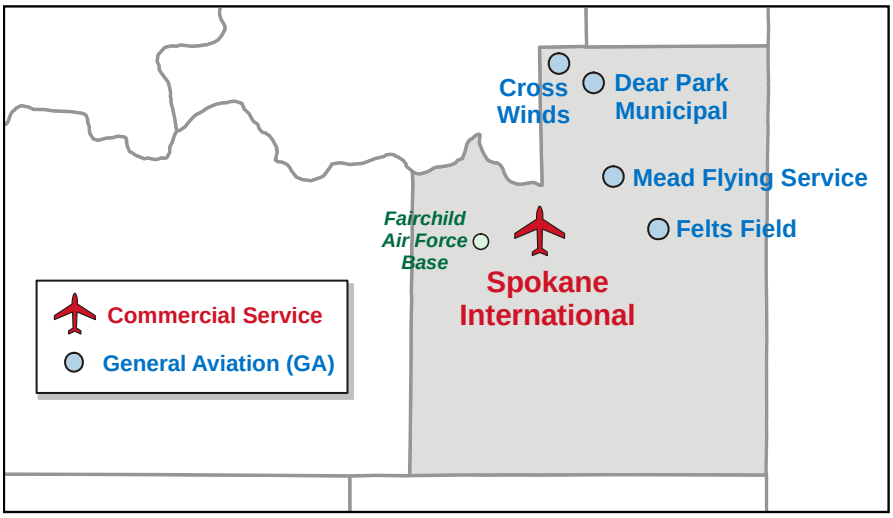
Of the eight airports, two either have no land capacity or have not provided land information in the undeveloped land inventory database survey.

Spokane Region

The Spokane Region identified in ESSB 5121 encompasses Spokane County and five airports. In addition, Fairchild Air Force Base is located within the region.

Figure 37: The Spokane Region





Spokane Region Passenger Capacity

Spokane International Airport is the only facility in the Spokane Special Emphasis Regions reporting scheduled commercial passenger service. Based on current peak hour passenger enplanement activity, the Spokane International Airport passenger terminal was operating at approximately one-third of its theoretical peak hour capacity.

Figure 38: Passenger Capacity in Spokane Region

Airport	Passenger Terminal Peak Hr Capacity	2005 Peak Hour Passengers	Capacity Utilization (%)	Reserve Capacity (%)
Spokane International	2,205	746	34%	66%
Total:	**2,205**	**746**	**34%**	**66%**

Key Highlight:

Based on current peak hour passenger enplanement activity, the Spokane International Airport passenger terminal has adequate passenger capacity.

Spokane Region Cargo Capacity

In recent years, Spokane International Airport significantly expanded its cargo apron facilities. As a result, cargo capacity was calculated based on apron capacity as the determining factor rather than building area. Based on the capacity of the airport's apron facilities, Spokane has 99 percent of its cargo capacity available for future growth.

Figure 39: Cargo Capacity in Spokane Region

Airport	Total 2005 Enplaned Cargo (in tons)	Estimated Cargo Building Capacity (in tons)	Capacity Utilization (%)	Reserve Capacity (%)
Spokane International [1]	55,347	4,280,000	1%	99%
Total:	**55,347**	**4,280,000**	**1%**	**99%**

[1] *Calculated based on dedicated apron and aircraft type rather than building size since cargo is processed off airport (ratio = 20 tons/sf/yr)*

Key Highlight:

Based on the capacity of the airport's apron facilities, Spokane has 99 percent of its cargo capacity available for future growth.

Spokane Region Aircraft Storage and Parking Capacity

The Spokane Region has a total of 541 based aircraft leaving less than 11 percent of reserve aircraft storage capacity available. The region is approaching full utilization of its existing aircraft storage capacity. Currently, 62 percent of the storage capacity is comprised of hangars and 38 percent is tie-downs. It is the only region with more tie-downs designated for transient aircraft than based aircraft. This is due to the fact that Felts Field has 112 transient tie-downs verses 28 based tie-downs. Spokane International has reached aircraft storage capacity while Deer Park Municipal and Felts Field are operating above 80 percent capacity. On the other hand, only 55 percent of the aircraft storage facilities are occupied at Mead Airport.

Figure 40: Aircraft Storage and Parking Capacity in Spokane Region

Airport	2005 Based Aircraft	Total Tie-downs	Total Hangars	Total Aircraft Capacity	Reserve Capacity	Storage Capacity Utilization (%)
Cross Winds^1	3	0	2	4	1	75%
Deer Park Municipal	90	40	65	105	15	86%
Felts Field	316	140	210	350	34	90%
Mead Airport	18	20	13	33	15	55%
Spokane International^2	114	32	22	114	0	100%
Total in Region	**541**	**232**	**312**	**606**	**65**	**89%**

^1 Hangars can accommodate more than one aircraft resulting in a total aircraft capacity of 4.

^2 Aircraft at air-carrier airports generally park at gates or remote overnight parking areas and do not utilize tie-downs or hangars. Facility appears to have additional aircraft capacity.

Key Highlight:

The Spokane Region is approaching complete utilization of its existing aircraft storage capacity.

Spokane Region Aircraft Operations Capacity

The aircraft operations capacity for the Spokane Region, as delineated under ESSB 5121, is presented in Figure 41 below. Spokane International Airport is the only Commercial Service facility in the Spokane Region. Based on 2005 activity levels, Spokane International has ample reserve operations capacity available. The remaining airports in the Spokane Region also have significant operations capacity beyond 2005 activity levels.

Figure 41: Aircraft Operations Capacity in Spokane Region

	State Service Classification	2005 Demand	Operations Capacity	Capacity Used	Reserve Capacity
Spokane International	Commercial Service	99,366	215,000	46.2%	53.8%
Subtotal by Service Class		99,366	215,000	46.2%	53.8%
Deer Park Municipal	Regional Service	31,552	230,000	13.7%	86.3%
Felts Field	Regional Service	68,649	230,000	29.8%	70.2%
Subtotal by Service Class		100,201	460,000	21.8%	78.2%
Cross Winds	Recreation/Remote	2,000	120,750	1.7%	98.3%
Mead Airport	Recreation/Remote	5,800	120,750	4.8%	95.2%
Subtotal by Service Class		7,800	241,500	3.2%	96.8%
Total by Region		207,367	916,500	22.6%	77.4%

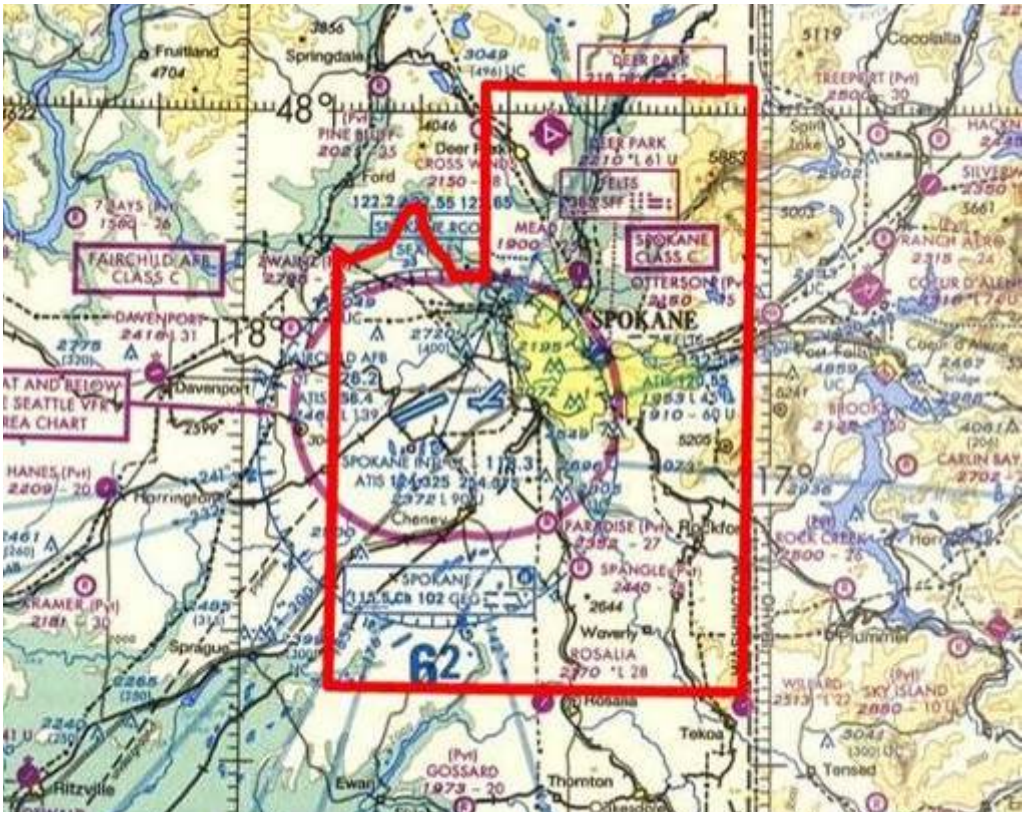
Key Highlight:

Spokane International has ample reserve operations capacity available, and remaining airports in the region also have significant operations capacity beyond 2005 activity levels.

Spokane Region Airspace

The airspace within the region (Figure 42) has no conflicts other than the shared airspace of Spokane International and Fairchild AFB. The Spokane Airport Board commissioned a study of regional airspace relative to a new runway alignment in 1994 for the purpose of assuring that all this air traffic interaction was adequately considered prior to constructing a parallel runway. The resulting report looked at traffic in the regional airspace and concluded that approach and departure paths for Runway 3/21 at Spokane International and Runway 5/23 at Fairchild Air Force Base did not operate independent of one another. It is possible that some coordinated airspace study of both facilities will be necessary prior to determining the optimum alignment of any new runway at Spokane International but that current operations can continue without capacity impacts.

Figure 42: Spokane Airspace



Spokane Region Undeveloped Land Capacity

Although the Spokane Region only consists of five airports, it currently has almost 20 percent of Washington State's undeveloped land capacity adjacent to airports. Both Deer Park Municipal Airport and Spokane International Airport have over 1,000 acres of undeveloped land.

Figure 43: Undeveloped Land Capacity in Spokane Region

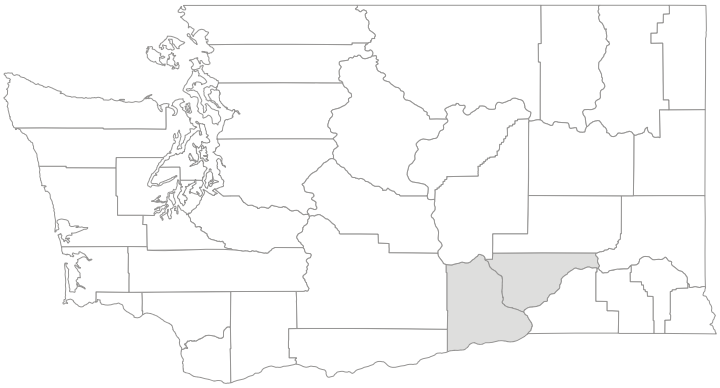
Airport	Undeveloped Land (acres)
Cross Winds	0
Deer Park Municipal	1,100
Felts Field	50
Mead Airport	10
Spokane International	1,189
Total	**2,349**

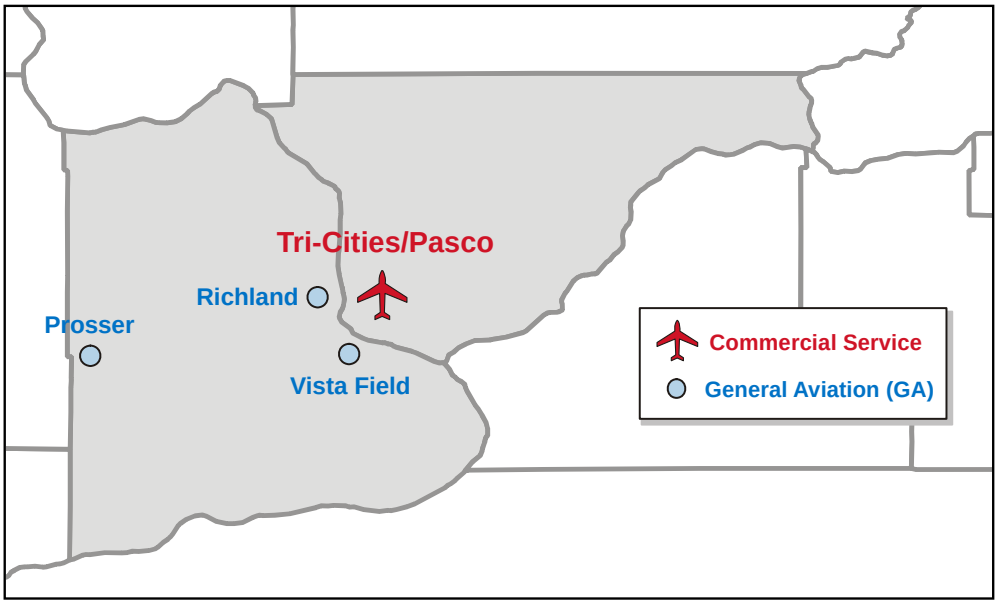
Key Highlight:

Spokane Region currently has almost 20 percent of Washington State's land capacity adjacent to airports.

Tri-Cities Region

Figure 44: The Tri-Cities Region





The Tri-Cities Region includes four airports located within Franklin and Benton Counties.

Tri-Cities Region Passenger Capacity

Pasco/Tri-Cities Airport is the only facility within the Tri-Cities Region Special Emphasis Regions with scheduled commercial passenger service. Based on current flight schedules, peak hour enplanements constitute 68 percent of the terminal's theoretical capacity. This level of demand ranks the Pasco/Tri-Cities Airport terminal on par with Seattle-Tacoma International relative to reserve capacity available.

Figure 45: Passenger Capacity in Tri-Cities Region

Airport	Passenger Terminal Peak Hr Capacity	2005 Peak Hour Passengers	Capacity Utilization (%)	Reserve Capacity (%)
Tri-Cities	271	185	68%	32%
Total:	**271**	**185**	**68%**	**32%**

Key Highlight:

Based on current flight schedules, peak hour enplanements constitute 68 percent of the terminal's theoretical capacity.

Tri-Cities Region Cargo Capacity

No cargo tonnages were reported for airports within the Tri-Cities Region Special Emphasis Regions.

Figure 46: Cargo Capacity in Tri-Cities Region

Airport	Total 2005 Enplaned Cargo (in tons)	Estimated Cargo Building Capacity (in tons)	Capacity Utilization (%)	Reserve Capacity (%)
Richland	Not Reported	8,000	0%	100%
Tri-Cities	Not Reported	Not Reported	Not Calculated	Not Calculated
Total:	**None**	**8,000**	**0%**	**100%**

Tri-Cities Region Aircraft Storage and Parking Capacity

There are 227 hangars and tie-downs in the Tri-Cities Region for a total inventory of 487. With only 293 based aircraft in the region, the airport system has plenty of reserve capacity to handle addition based or transient aircraft. Less than 50 percent of the aircraft storage facilities are occupied at Prosser and Richland. Vista Field is at 80 percent capacity with only nine aircraft storage capacity available while Tri-Cities is at 86 percent capacity. This region has the same number of hangars and tie-downs. Nevertheless, demand for hangars at Tri-Cities is far greater than tie-downs. The ratio of the number of hangars to tie-downs is roughly 2:1. On the other hand, the number of tie-downs out numbered hangars by a ratio of 4:1 at Prosser.

Figure 47: Aircraft Storage and Parking Capacity in Tri-Cities Region

Airport	2005 Based Aircraft	Total Tie-downs	Total Hangars	Total Aircraft Capacity	Reserve Capacity	Storage Capacity Utilization (%)
Prosser	46	74	20	94	48	49%
Richland	82	98	100	198	116	41%
Tri-Cities^1	130	35	83	151	21	86%
Vista Field	35	20	24	44	9	80%
Total in Region	**293**	**227**	**227**	**487**	**194**	**60%**

^1 Hangar can accommodate up to 30 aircraft and another up to 5 aircraft.

Key Highlight:

With only 293 based aircraft in the region, the airport system has plenty of reserve capacity to handle addition based or transient aircraft.

Tri-Cities Region Aircraft Operations Capacity

The aircraft operations capacity for airports under ESSB 5121's Tri-Cities Region are presented in Figure 48. The Pasco/Tri-Cities Airport is the only Commercial Service airport in this Region. Both the Pasco/Tri-Cities airport, as well as the three remaining airports, Richland, Prosser and Vista Field, all have substantial reserve capacity over and above 2005 activity levels.

Figure 48: Aircraft Operations Capacity in Tri-Cities Region

	State Service Classification	2005 Demand	Operations Capacity	Capacity Used	Reserve Capacity
Tri-Cities	Commercial Service	87,952	260,000	33.8%	66.2%
Subtotal by Service Class		87,952	260,000	33.8%	66.2%
Richland	Regional Service	22,377	115,000	19.5%	80.5%
Subtotal by Service Class		22,377	115,000	19.5%	80.5%
Prosser	Local Comm less than 10 A/C	12,200	230,000	5.3%	94.7%
Subtotal by Service Class		12,200	230,000	5.3%	94.7%
Vista Field	Local Comm more than 10 A/C	26,000	230,000	11.3%	88.7%
Subtotal by Service Class		26,000	230,000	11.3%	88.7%

Total by Region	148,529	835,000	17.8%	82.2%

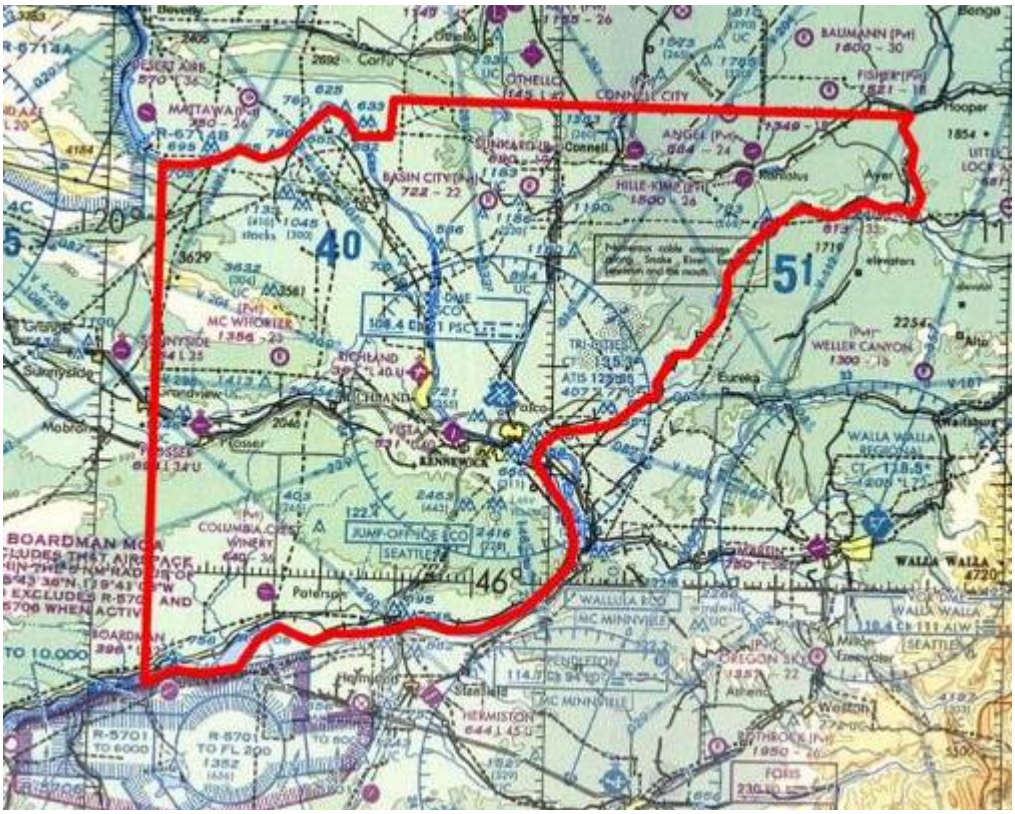
Key Highlight:

Tri-Cities, Richland, Prosser and Vista Field airports all have substantial reserve capacity over and above 2005 activity levels.

Tri-Cities Region Airspace

There are numerous active airports within 50 miles of the Tri-Cities (Figure 49). Of these, 16 are private strips but eight are public facilities that have some impact on regional operations. A review of the current airspace procedures shows that there are no airspace conflicts among these facilities.

Figure 49: Tri-Cities Airspace


40
51
46
RICHLAND
PASCO
KENNEWICK
Prosser
BOARDMAN
WALLA WALLA
HERMISTON
Pendleton
Umatilla
Connell
Othello
Ephrata
Moses Lake
Eureka
Alto
Waitsburg
Athena
Weston
Milton-Freewater
Hermiston
Stanfield
Pasco
Mabton
Sunnyside
Grandview
Grange
Mattawa
Desert Airs
Basin City
Connell City
Hooper
Ayer
Benge
Dayton
Pomeroy
Starbuck
Dixie
Touchet
Burbank
Wallula
Plymouth
Umatilla
Boardman
Irrigon
Ione
Cecil
Kennewick
Richland
Pasco
Prosser
Sunnyside
Mabton
Grandview
Grange
Mattawa
Desert Airs
Othello
Connell
Connell City
Basin City
Hooper
Ayer
Benge
Eureka
Alto
Waitsburg
Walla Walla
Milton-Freewater
Athena
Weston
Hermiston
Stanfield
Pendleton
Umatilla
Boardman
Irrigon
Ione
Cecil
Dixie
Touchet
Burbank
Wallula
Plymouth
Starbuck
Pomeroy
Dayton
Moses Lake
Ephrata
Pasco
Kennewick
Richland

Tri-Cities Region Undeveloped Land Capacity

All four airports in the Tri-Cities Region have undeveloped land available. The total capacity is 1976 acres, with about 73 percent (1436 of 1976) from Tri-Cities Airport and about 20 percent (400 of 1976) from Richland Airport.

Figure 50: Undeveloped Land Capacity in Tri-Cities Region

Airport	Undeveloped Land (acres)
Prosser	90
Richland	400
Tri-Cities	1436
Vista Field	50
Total	**1976**

Key Highlight:

All airports in the Tri Cities Region have undeveloped land available, with at total of almost 2,000 acres.

What is the Existing Capacity at Each RTPO?

The airports within each RTPO are listed below in Figure 51.

Figure 51: Regional Transportation Planning Organization (RTPO) Regions

Regional Transportation Planning Organization (RTPO)	Counties Included	Airports	State Classification
Benton-Franklin-Walla Walla RTPO	Benton	Prosser	Local Comm more than 10 A/C
		Richland	Regional Service
		Vista Field	Local Comm less than 10 A/C
	Franklin	Tri-Cities	Commercial Service
	Walla Walla	Lower Monumental State	Recreation or Remote
		Martin Field	Recreation or Remote
		Walla Walla Regional	Commercial Service
Northeast Washington	Ferry	Avey Field State	Recreation or Remote
		Ferry County	Local Comm less than 10 A/C

Regional Transportation Planning Organization (RTPO)	Counties Included	Airports	State Classification
RTPO	Pend Oreille	Ione Municipal	Recreation or Remote
		Sullivan Lake State	Recreation or Remote
	Stevens	Colville Municipal	Local Comm more than 10 A/C
		Sand Canyon	Local Comm more than 10 A/C
North Central RTPO	Chelan	Cashmere Dryden	Local Comm more than 10 A/C
		Chelan Municipal	Local Comm more than 10 A/C
		Lake Wenatchee State	Recreation or Remote
		Stehekin State	Recreation or Remote
	Douglas	Mansfield	Local Comm less than 10 A/C
		Pangborn Memorial	Commercial Service
		Waterville	Local Comm more than 10 A/C
	Okanogan	Anderson Field	Local Comm more than 10 A/C
		Dorothy Scott Municipal	Local Comm more than 10 A/C
		Lost River Airport	Recreation or Remote
		Methow Valley	Recreation or Remote
		Okanogan Legion	Local Comm more than 10 A/C
		Omak	Regional Service
		Tonasket Municipal	Local Comm more than 10 A/C
		Twisp Municipal	Local Comm less than 10 A/C
Palouse RTPO	Asotin	Rogersburg State	Recreation or Remote
	Columbia	Little Goose Lock & Dam State	Recreation or Remote
	Whitman	Lower Granite State	Recreation or Remote
		Pullman/Moscow Regional	Commercial Service
		Rosalia Municipal	Local Comm more than 10 A/C
		Whitman County Memorial	Local Comm more than 10 A/C
		Willard Field	Local Comm more than 10 A/C
Peninsula RTPO	Clallam	Forks Municipal	Local Comm less than 10 A/C
		Quillayute	Recreation or Remote
		Sekiu	Local Comm less than 10 A/C
		Sequim Valley	Recreation or Remote
		Wm. R. Fairchild International	Commercial Service
	Jefferson	Jefferson County International	Local Comm more than 10 A/C
	Mason	Sanderson Field	Regional Service
Puget Sound Regional Council	King	Auburn Municipal	Regional Service
		Bandera State	Recreation or Remote
		Boeing Field/King County Int'l	Commercial Service
		Crest Airpark	Recreation or Remote
		Kenmore Air Harbor SPB/Lake Union	Seaplane Base
		Kenmore Air Harbor, Inc.	Commercial Service
		Lester State	Recreation or Remote
		Renton Municipal	Regional Service
		Seattle-Tacoma International	Commercial Service
		Skykomish State	Recreation or Remote
		Vashon Municipal	Recreation or Remote
		Will Rogers Wiley Post SPB	Seaplane Base

Regional Transportation Planning Organization (RTPO)	Counties Included	Airports	State Classification
	Kitsap	Bremerton National Poulsbo SPB	Regional Service Seaplane Base
	Pierce	American Lake SPB Pierce County/Thun Field Ranger Creek State Shady Acres Spanaway Swanson Field Tacoma Narrows	Seaplane Base Local Comm more than 10 A/C Recreation or Remote Recreation or Remote Recreation or Remote Recreation or Remote Regional Service
	Snohomish	Arlington Municipal Darrington Municipal Firstair Field Harvey Field Sky Harbor Snohomish County/Paine Field	Regional Service Local Comm less than 10 A/C Recreation or Remote Regional Service Recreation or Remote Regional Service
Quad-County RTPO	Adams	Lind Municipal Othello Municipal Pru Field	Local Comm less than 10 A/C Local Comm more than 10 A/C Local Comm less than 10 A/C
	Grant	Desert Aire Ephrata Municipal Grand Coulee Dam Grant County International Moses Lake Municipal New Warden Quincy Municipal Wilson Creek	Recreation or Remote Local Comm more than 10 A/C Local Comm less than 10 A/C Commercial Service Local Comm more than 10 A/C Local Comm less than 10 A/C Local Comm less than 10 A/C Local Comm less than 10 A/C
	Kittitas	Bowers Field Cle Elum Municipal DeVere Field Easton State	Regional Service Local Comm less than 10 A/C Recreation or Remote
	Lincoln	Davenport Municipal J-Z Odessa Municipal Wilbur Municipal	Local Comm more than 10 A/C Recreation or Remote Local Comm more than 10 A/C Local Comm more than 10 A/C
Skagit/Island RTPO	Island	Camano Island Airfield Wes Lupien Whidbey Airpark	Recreation or Remote Local Comm less than 10 A/C Recreation or Remote
	Skagit	Anacortes Concrete Municipal Skagit Regional Skyline SPB	Commercial Service Local Comm more than 10 A/C Regional Service Seaplane Base
Spokane Regional Transportation Council	Spokane	Cross Winds Deer Park Municipal Felts Field Mead Airport Spokane International	Recreation or Remote Regional Service Regional Service Recreation or Remote Commercial Service
Southwest Washington Regional	Clark	Cedars North Airpark Evergreen Field Fly For Fun	Recreation or Remote Recreation or Remote Recreation or Remote

Regional Transportation Planning Organization (RTPO)	Counties Included	Airports	State Classification
Transportation Council		Goheen Field Grove Field Pearson Field	Recreation or Remote Local Comm more than 10 A/C Local Comm more than 10 A/C
	Klickitat	Columbia Gorge Reg/The Dalles Goldendale Municipal Hillcrest	Regional Service Local Comm more than 10 A/C Recreation or Remote
Southwest Washington RTPO	Cowlitz	Kelso-Longview Woodland State	Regional Service Recreation or Remote
	Lewis	Chehalis Centralia Packwood Strom Field Ed Carlson Memorial Airport	Local Comm more than 10 A/C Local Comm less than 10 A/C Local Comm less than 10 A/C Local Comm more than 10 A/C
	Pacific	Port of Ilwaco Willapa Harbor	Local Comm less than 10 A/C Local Comm less than 10 A/C
Thurston Regional Planning Council	Thurston	Hoskins Field Olympia R & K Skyranch Western Airpark	Recreation or Remote Regional Service Recreation or Remote Recreation or Remote
Whatcom Council of Governments	Whatcom	Bellingham International Blaine Municipal Floathaven SPB Lynden Municipal Point Roberts Airpark	Commercial Service Local Comm more than 10 A/C Seaplane Base Recreation or Remote Recreation or Remote
Yakima Valley Conference of Governments	Yakima	Sunnyside Municipal Tieton State Yakima Air Terminal	Local Comm more than 10 A/C Recreation or Remote Commercial Service
Airports Not in RTPO	San Juan	Friday Harbor Friday Harbor SPB Lopez Island Orcas Island Roche Harbor SPB Rosario SPB	Commercial Service Seaplane Base Local Comm more than 10 A/C Commercial Service Seaplane Base Seaplane Base

Passenger Capacity by RTPO Region

The capacity of the RTPOs aviation system was measured to determine whether the region possessed adequate capacity to meet their current needs for commercial airline service. The information shown in Figure 51 shows the year 2005 demand for passenger service (expressed as the number of enplaned passengers) compared with the capacity of the airports. It is noted that some of the RTPOs do not currently contain airports where commercial service is offered. In these cases both the demand and capacity have been registered as zero. In actuality, the area

does produce demand for commercial service but that demand accesses passenger service in a neighboring district.

Figure 52: Passenger Capacity by RTPO Region

RTPO Region	Passenger Terminal Peak Hr Capacity	2005 Peak Hour Psgrs	Capacity Utilization (%)	Reserve Capacity (%)
Benton-Franklin-Walla Walla RTPO	1,015	215	21%	79%
North Central RTPO	480	30	6%	94%
Palouse RTPO	520	30	6%	94%
Puget Sound Regional Council	8,225	5,515	67%	33%
Quad-County RTPO	1,504	37	2%	98%
Spokane Regional Transportation Council	2,205	746	34%	66%
Whatcom Council of Governments	149	30	20%	80%
Yakima Valley Conference of Governments	176	30	17%	83%
Total	**14,098**	**6,640**	**47%**	**53%**

Key Highlights:

Peak hour passenger demand and terminal capacity are clearly the greatest within the PSRC region due to the area's population density and the presence of Seattle-Tacoma International Airport. The PSRC airports have the greatest capacity utilization and lowest reserve capacity of any airports within Washington State. All other RTPO regions have significant reserve capacity available to accommodate future passenger growth.

Cargo Capacity by RTPO Region

The capacity of the RTPOs to accommodate air cargo shipments was also recorded and is shown in the following Figure 53. Like commercial passenger service, air cargo facilities vary from RTPO to RTPO.

Figure 53: Cargo Capacity by RTPO Region

RTPO Region	2005 Demand (tons)	2005 Capacity (tons)	Capacity Utilization (%)	Reserve Capacity (%)
Benton-Franklin-Walla Walla RTPO	None	8,000	0%	100%
Northeast Washington RTPO	NA	NA	0%	0%
North Central RTPO	125	28,000	0.5%	99.5%
Palouse RTPO	NA	NA	0%	0%
Puget Sound Regional Council [1]	809,657	1,190,000	68%	32%
Quad-County RTPO	None	12,000	0%	100%
SMPO	1,060	6,000	18%	82%
Spokane Regional Transportation Council [1]	55,347	4,280,000	1%	99%
Southwest Washington Regional Transportation Council	NA	NA	0%	0%
Southwest Washington RTPO	NA	NA	0%	0%
Thurston Regional Planning Council	NA	NA	0%	0%
Whatcom Council of Governments	NA	NA	0%	0%
Yakima Valley Conference of Governments	NA	NA	0%	0%
Total	866,189	5,524,000	16%	84%

1 Calculated based on dedicated apron and aircraft type rather than building size since cargo is processed off airport (ratio = 20 tons/sf/yr)

Key Highlights:

Similar to passenger activity, the PSRC RTPO airports also report the largest cargo volumes in Washington. Boeing Field/King County International Airport and Seattle-Tacoma International Airport accommodate the cargo activity within the Puget Sound RTPO and Washington State. The reserve capacity of cargo facilities in the PSRC region is limited, but is much higher in other regions.

Aircraft Storage and Parking Capacity by RTPO Region

This section describes the existing capacity for aircraft storage and parking throughout the individual RTPOs. It also reviews number of based aircraft to determine reserve capacity available by RTPO. The information provided in Figure 54 lists the number of based aircraft, aircraft storage capacity, and hangar wait list totals in each of the RTPOs in the state of Washington. As of 2005, aircraft storage capacity in Washington State totals 9,402, of which 4,459 are aircraft tie-downs and 4,943 are hangars. Since there is a total of 7,889 aircraft based in the state, the airport system as a whole has reached 84 percent of its existing aircraft storage capacity. In fact, 46 percent of all RTPOs (6 out of 13 RTPOs) have either exceeded or are approaching their existing based aircraft storage capacity. These include the Northeast Washington RTPO, the Spokane Regional Transportation Council RTPO, the Southwest Washington RTPO, the Thurston Regional Planning Council RTPO, the Whatcom Council of Governments RTPO, and the Yakima Valley Council of Governments RTPO. The remainder of the RTPOs has a greater reserve capacity to store aircraft; however, most pilots and owners in Washington prefer secure, weather-proof storage facilities for their aircraft. As such, the actual demand for hangars is far greater than demand for tie-downs.

Of the 4,459 aircraft tie-downs available in Washington State, 31 percent are designated for transient aircraft. Only the North Central RTPO, the Spokane Regional Transportation Council RTPO, and the Southwest Washington RTPO have more tie-downs designated for transient aircraft than based aircraft. Information on waiting list for hangars was also provided by airport managers as available. A total of 651 people are on wait list at airports to obtain a hangar rental. The PSRC accounts for 64 percent of the total number of people on the wait list, while the Whatcom Council of Governments RTPO and the Yakima Valley Council of Governments RTPO have not reported any people on a hangar wait list. It is unknown whether these people are existing airport tie-down tenants or how many are trying to move their aircraft from one airport to another. Nonetheless, it gives a representation of hangar demand for future planning purposes.

Figure 54: Aircraft Storage and Parking Capacity by Region

RTPO	2005 Based Aircraft	Total Tie-downs	Total Hangars	Total Aircraft Capacity	Reserve Capacity	Storage Capacity Utilization (%)
Benton-Franklin-Walla Walla	467	305	339	644	177	73%
Northeast Washington	60	39	17	56	0	100%
North Central	403	296	206	502	99	80%
Palouse	111	107	45	152	41	73%
Peninsula RTPO	329	276	198	474	145	69%
Puget Sound Regional Council	3,696	1,645	2,628	4,297	664	75%
Quad-County	406	292	193	485	79	84%
Skagit/Island	299	191	192	383	84	78%
Spokane Regional Transportation Council	541	232	312	544	65	89%
Southwest Washington Regional Transportation Council	448	383	363	746	298	60%
Southwest Washington	291	189	140	329	38	88%
Thurston Regional Planning Council	198	76	102	178	0	100%
Whatcom Council of Governments	223	115	136	251	28	89%
Yakima Valley Council of Governments	166	136	4	140	0	100%
Airports not in RTPO	251	177	68	245	0	100%
Total in Washington State	7,889	4,459	4,943	9,402	1,513	84%

Key Highlight:

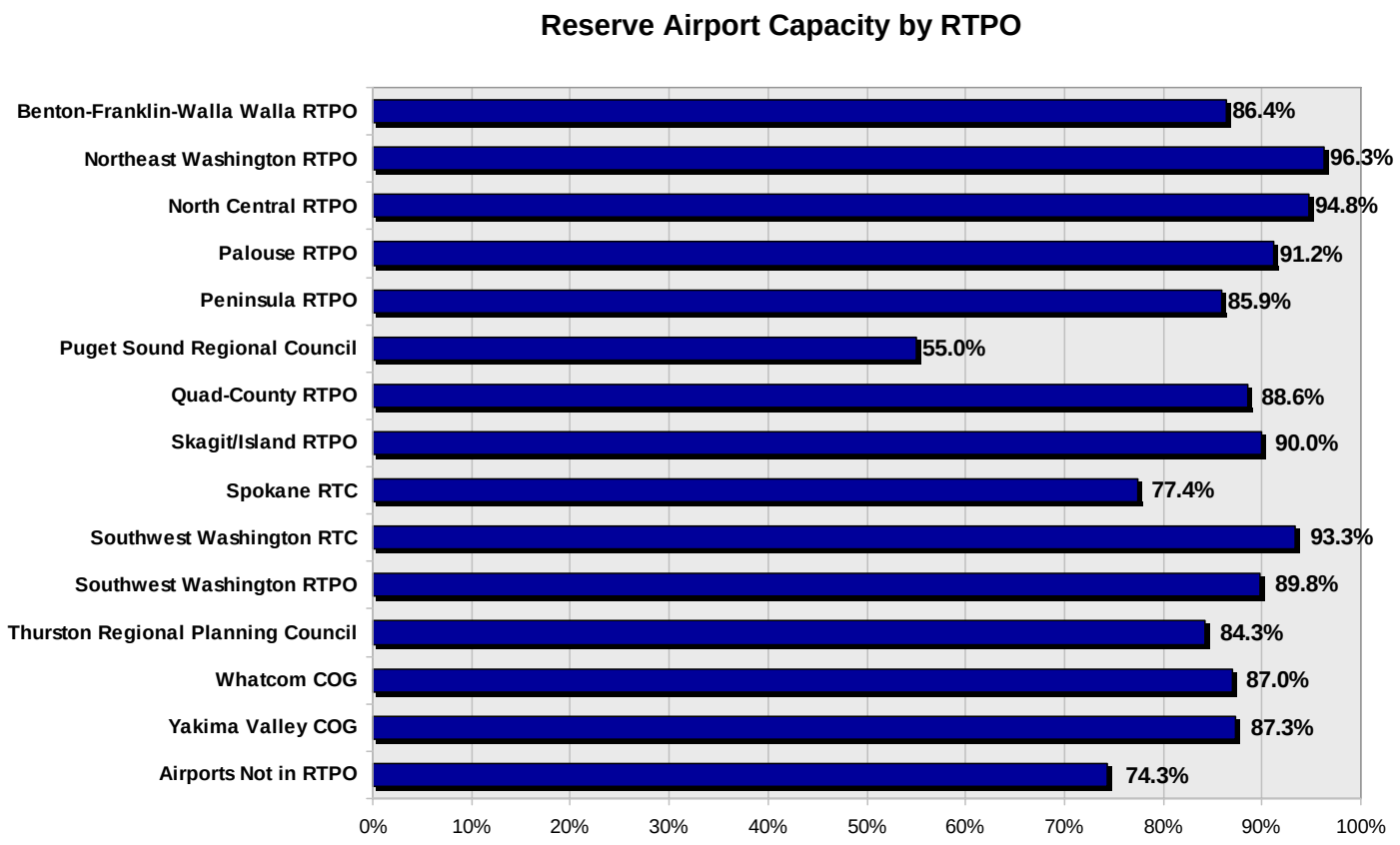
Forty six percent of all RTPOs (six out of 13 RTPOs) have either exceeded or are approaching their existing based aircraft storage capacity.

Aircraft Operations by RTPO Region

Aircraft operation capacities by RTPO region are summarized in Figure 55 below. When aircraft operations and airport capacity are aggregated at a regional level, significant reserve capacity is available throughout Washington State. The airports within the PSRC planning area have the least overall reserve capacity at 55 percent. This data suggests that airports in the Puget Sound area are generally the busiest airports in Washington. Given that Figure 55 data reflects all airports within a specific planning area, significant differences in activity levels and reserve capacity may exist between individual airports.

Figure 55: Aircraft Operations Capacity by RTPO Region

RTPO Region	2005 Demand[1]	Operations Capacity[1]	Capacity Used[1]	Reserve Capacity[1]
Benton-Franklin-Walla Walla RTPO	188,847	1,386,500	13.6%	86.4%
Northeast Washington RTPO	34,500	943,000	3.7%	96.3%
North Central RTPO	128,775	2,466,750	5.2%	94.8%
Palouse RTPO	100,639	1,138,000	8.8%	91.2%
Peninsula RTPO	154,100	1,092,500	14.1%	85.9%
Puget Sound Regional Council	1,668,382	3,705,459	45.0%	55.0%
Quad-County RTPO	375,906	3,307,950	11.4%	88.6%
Skagit/Island RTPO	101,393	1,017,500	10.0%	90.0%
Spokane Regional Trans. Council	207,367	916,500	22.6%	77.4%
Southwest Washington Regional Transportation Council	108,350	1,629,000	6.7%	93.3%
Southwest Washington RTPO	192,549	1,883,000	10.2%	89.8%
Thurston Regional Planning Council	89,990	575,000	15.7%	84.3%
Whatcom Council of Governments	89,652	690,000	13.0%	87.0%
Yakima Valley Conference of Govts	73,688	580,750	12.7%	87.3%
Airports Not in RTPO	153,946	598,000	25.7%	74.3%
Total[1]	**3,668,084**	**21,929,909**	**16.7%**	**83.3%**



Key Highlight:

Airports within the PSRC planning area have the least overall reserve capacity at 55 percent.

Undeveloped Land Capacity by RTPO Region

Washington State currently has a total of approximately 13,616 acres available to accommodate airport development needs. Of this total, about 75 percent of the available land is located in four RTPOs: Benton-Franklin-Walla Walla RTPO, PSRC, Quad-County RTPO, and Spokane Regional Transportation Council. Benton-Franklin-Walla Walla RTPO alone has approximately 24 percent of the state's undeveloped land.

It is important to note that the physical location as well as the geography of the undeveloped land can significantly affect how it can be used. Also, a total of 82 airports either have no land capacity or did not provide any information in the undeveloped land inventory database survey. As a result, the reported acreage could be significantly less than the actual land available.

Figure 56: Undeveloped Land Capacity by Region

RTPO	Undeveloped Land (acres)
Benton-Franklin-Walla Walla RTPO	3,308
Northeast Washington RTPO	114
North Central RTPO	250
Palouse RTPO	488
Peninsula RTPO	610
Puget Sound Regional Council	1,754
Quad-County RTPO	2,585
Skagit/Island RTPO	470
Spokane Regional Transportation Council	2,349
Southwest Washington Regional Transportation Council	639
Southwest Washington RTPO	115
Thurston Regional Planning Council	880
Whatcom Council of Governments	9
Yakima Valley Council of Governments	12
Airports not in RTPO	33
Total	**13,616**

Key Highlights:

Approximately 75 percent of the available land is located in four RTPOs: Benton-Franklin-Walla Walla RTPO, PSRC, Quad-County RTPO, and Spokane Regional Transportation Council.

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PART 5: ARE WASHINGTON'S AVIATION SYSTEM FACILITIES, ACTIVITIES AND SERVICES ADEQUATE?

In 2005, 140 public use airports were included in the Washington aviation system. Airports included in the study are shown in the fold-out map on Page 5 of this report. The airports range in size from turf runway facilities to large, multi-runway commercial facilities.

The data tables presented in this section provide a statistical overview summarizing the current state of the Washington Aviation System. The tables provide an understanding what is happening at the airports and the range of airport facilities and services available. The information in the tables helps to establish the baseline conditions and set the context for the airport and system capacity and performance analyses to follow. Information is arranged into three parts, which include:

- Washington State System Overview of Facilities, Activities and Services
- Summary of Minimum Criteria for all airports
- Detailed System Performance Presented by Airport Classification

The airport overview tables are not intended to provide a complete breakdown of all data compiled on Washington airports during the survey process. For more complete information on each airport in the state system, an inventory summary report for each airport is provided on the WSDOT Aviation Web site.

State System Facilities, Activities and Services Overview

Most of the airport survey data presented below is categorized according to the proposed State Airport Classifications and addresses the performance and capacity measures summarized in Part 3 and 4 of the report. This information provides background information on how each airport operates and the types and sizes of aircraft using the airport. The Washington Aviation System data summarized in this section is presented according to proposed state classification and includes the following information:

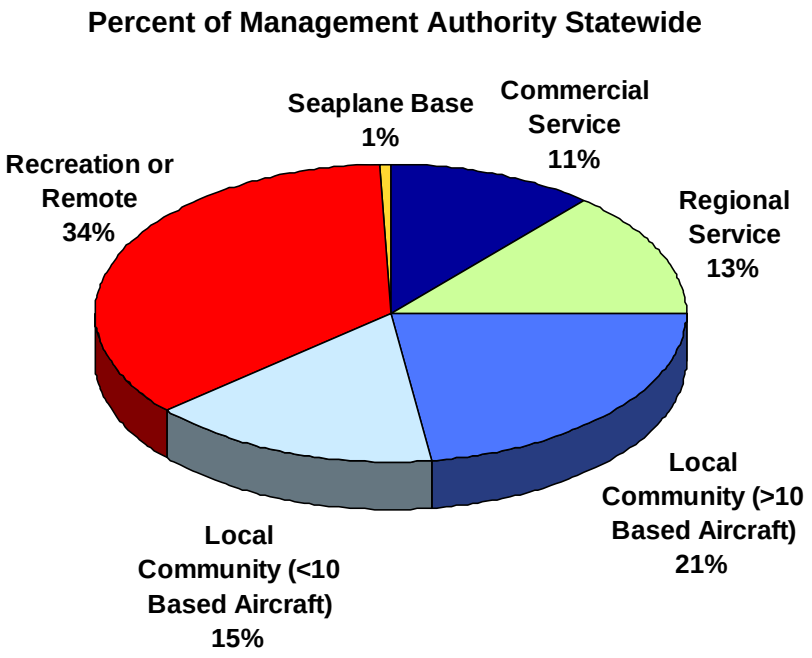
- Management authority
- 2005 airport activity
- Scheduled commercial passenger carriers serving Washington airports
- Commercial cargo carriers serving Washington airports and 2005 enplaned tonnage
- Aviation-related services and activities
- Airport reference code
- Instrument approach capabilities
- Airside facilities available
- Aircraft apron and parking
- Landside facilities available

1. Who Operates Washington's Airports?

In most cases, the entity managing the airport also owns the facility. Over 75 percent of Washington airports are under a public ownership and management structure. Of the Commercial Service Airports, 73 percent are managed by port districts. Over 75 percent of the privately owned airports in the state are recreational or remote airports.

Figure 57: Management Authority

Management Authority	Commercial Service	Regional Service	Local Community (Less then 10 Aircraft)	Local Community (More then 10 Aircraft)	Recreation or Remote	Seaplane Base	State System Total
Washington State					17		17
County	1	2	4	2	1		10
City/Municipal		7	17	12	6	2	44
Port District	11	7	7	6		2	33
Joint	2	1	2				5
Private	1	1		1	23	5	31
Total Airports	15	18	30	21	47	9	140



Since the majority of the airports within the state are owned and operated by public entities it would imply a level of stability and commitment that does not always exist at private airports. Public airports have access to state and federal grant funding and are more likely to be operated and maintained at a higher level. Private airports tend to be less consistent with respect to maintenance and also less secure. Recently, Evergreen Airport, one of the state's private airports, was closed due to outside influences. Ports and cities are likely to see the airport as a vital part of a local transportation system and as being a component of a community's total economic development package.

Commercial Airport Activity Key Findings

Commercial Service and Regional Service airports have broad ownership across numerous categories. All airports operated by WSDOT Aviation are included in the Recreation or Remote classification. Mostly privately owned airports in the state aviation system are assigned to the Recreation or Remote classification.

2. What is Happening at Washington's Airports?

In Figure 58, 2005 airport activity levels reported by the state system airports for enplaned passengers, aircraft operations and enplaned cargo tonnages are listed. The Commercial Service Airports report the greatest activity levels for enplaned passengers and cargo.

Figure 58 provides a breakdown of activity by service level for the following indicators:

- Enplaned Commercial Passengers: The number of departing passengers boarding scheduled commercial aircraft.
- Total Based Aircraft: Total number of planes permanently stationed at the airport in 2005.
- Total 2005 Operations: The sum total of all aircraft takeoffs and landings at the airport in 2005.
- GA Local Operations: Local takeoffs and landings that include training or touch-and-go activity and by definition do not leave the airport's air traffic control area.
- GA Itinerant Operations: Takeoffs and landing are aircraft operations extending beyond the airport traffic area or entering the traffic area from the outside.
- Air Carrier Operations: Represents either a takeoff or a landing by a scheduled commercial airline with seating capacity of more than 60 or an all-cargo airline of comparable size.
- Air Taxi Operations: Commercial includes takeoffs and landings by aircraft with 60 or fewer seats conducted on non-scheduled or for-hire flights.
- Military Operations: Represent takeoffs and landings by Department of Defense aircraft, including rotorcraft.
- Ultralight Operations: The sum total of all glider aircraft take-offs and landings at the airport in 2005.
- Seaplane Operations: The sum total of all amphibian/water capable aircraft takeoffs and landings in 2005.
- Enplaned Cargo Tonnage: Total freight and mail volume departing the airport via aircraft in 2005.

Figure 58: 2005 Summary of Commercial Airport Activity Including Passengers, Operations and Based Aircraft

Operation Type	Commercial Service	Regional Services	Local Community (Less than 10 Based Aircraft)	Local Community (More than 10 Based Aircraft)	Recreation or Remote	Seaplane Base	State System Total
Enplaned Commercial Passengers	11,303,909	-	3,500	-	-	70,000	11,377,409
Total Based Aircraft	3,274	2,130	414	67	136	81	6,102
Total 2005 Operations	3,996,558	663,315	38,820	63,663	30,560	73,825	4,866,741
GA Local Operations	531,936	303,696	17,900	28,763	4,700	5,100	892,095
GA Itinerant Operations	554,110	331,856	16,200	33,350	24,980	820	961,316
Air Carrier Operations	2,057,349	12,793	-	-	-	-	2,070,142
Air Taxi Operations	844,352	1,050	-	450	11,145	31,005	888,002
Military Operations	42,506	3,120	-	350	310	-	46,286
Ultralight Operations	-	500	3,710	150	70	-	4,430
Seaplane Operations	-	205	1,010	-	50	36,900	38,165
Enplaned Cargo Tonnage	865,004	251,060	-	-	-	-	1,116,064

Share of 2005 Operations by State Classification

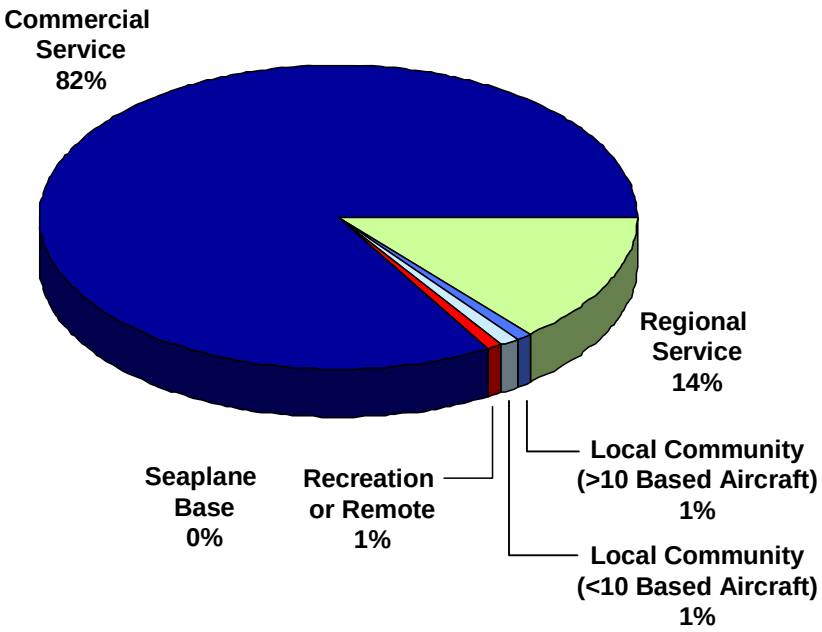


Figure 58 - Shows that the aviation system in Washington State is well balanced, providing the citizens of the state with the full range of aviation opportunities, as appropriate to the community that they serve. One unusual feature is the range of services available at seaplane facilities, representing WA's unique system.

The number of general aviation local operations suggest that significant flight training activities must be occurring within the state.

Commercial Airport Activity Key Findings:

Commercial Service airports accommodate the majority of general aviation operations and based aircraft in the state aviation system. Cargo tonnage is concentrated at to airports, one Commercial Service and one Regional Service. Commercial air carrier operations make up a significant percentage of total operations in Washington.

Washington Airports with Commercial Passenger Service

Scheduled commercial passenger service was reported at 14 airports statewide in 2005. Not all airports reporting commercial passenger service are included in the state Commercial Service airport classification. Two airports reporting passenger service are classified as Regional Service Airports, two are Local Community Airports, and one is a Seaplane Base. In Figure 59, the reported number of individual passenger carriers serving the airport is presented for those airports with scheduled passenger service.

Figure 59: Number of Scheduled Commercial Passenger Carriers Serving Washington Airports

Airport	Commercial Service	Regional Service	Local Community (Less than 10 Based Aircraft)	Local Community (More than 10 Based Aircraft)	Recreation or Remote	Seaplane Base
Anacortes	1					
Bellingham International	4					
Boeing Field/King Co. Int'l	1	1				
Grant County International	2					
Kenmore Air Harbor SPB						1
Omak		1				
Pangborn Memorial	1					
Pullman/Moscow Regional	1					
Sea-Tac International	24					
Skagit Regional				1		
Spokane International	11					
Tri-Cities	3					
Vista Field				1		
Walla Walla Regional	3					
Wm. R. Fairchild Int'l	1					
Yakima Air Terminal	1					

Figure 59 shows the dominant role of Sea-Tac and Spokane International within the state's commercial service system. Seattle provides regional service to the state's smaller communities and Spokane provides limited regional service to a few Washington communities as well. All other Washington commercial service airports are essentially "spoke points" to Sea-Tac, Spokane or another hub carrier market such as Salt Lake City. Therefore Sea-Tac has a critical role for future air service development within the state and its constraint issues, along with market demand, will impact the commercial service environment in Washington. (e.g. If Sea-Tac's capacity constraints result in delays, the entire state system experiences delays).

Research into the recently initiated, non-Sea-Tac destined, services offered at Bellingham and Tri-Cities could offer some opportunities for growth beyond Sea-Tac and this may benefit passenger growth in underdeveloped regions in the state. Other non-hub air service development examples include Kenmore Air Service at Port Angeles and

Skagit flights to Boeing Field/King County International. Both represent a market trend that will continue to positively impact air service in the state, as well as increase the disproportionate development of air service on the west side of the Cascade Mountains.

Several airports currently listed as community service facilities have reported some form of commercial service available. It is important to track commercial airline development of regional service in smaller communities as this may result in more effective use of underutilized airport facilities.

Commercial Passenger Service Key Findings

Passenger carrier activity is concentrated at Sea-Tac and Spokane International. Multiple passenger carriers are also located at Bellingham International, Tri-Cities, and Walla Walla. Grant County International, formerly a subsidize Essential Air Service market, has recently lost its USDOT subsidy and its commercial service has been discontinued. Previously, Grant County had twice daily, 19-seat turbo prop service to Portland and one daily flight to Boise.

Washington Airports with Air Cargo Service

Airports reporting air cargo service are presented in Figure 60. Each airport is identified by proposed State Airport Classification, along with the number of cargo carriers serving the airport and 2005 enplaned cargo tonnage figures, where tonnages are available. Not all airports have the means or mechanism for recording cargo tonnage levels.

There are 15 airports in the state reporting service by all cargo carriers. The top three are Seattle Tacoma International, Spokane International, and Boeing Field/King County International. Each of these is recognized by FAA as having significant operations by cargo carriers and, consequently, is eligible for cargo entitlement money for improvements at the airport under the AIP. Of these three airports, Sea-Tac captures the largest percentage of total reported cargo tonnage statewide.

Of the remaining airports served by cargo airlines only two, Skagit Regional and Omak track the volume of cargo being enplaned at their facilities. The remainder, Anacortes, Grant County International, Kenmore Air Harbor, Pangborn Memorial, Pullman Moscow, Richland, Tri-Cities, Vista Field, Walla Walla Regional, and William R. Fairchild International all have service by cargo carriers operating small package feeder aircraft. In these cases the volume of cargo is small and not tracked by the airport, and therefore not reported on the following table.

Primarily, this cargo consists of small packages being shipped through either Boeing Field/King County International or Sea-Tac.

Figure 60: Number of Cargo Carriers Serving Airports and 2005 Enplaned Tonnage

Airport	Commercial Service	Regional Service	Local Community (Less than 10 Based Aircraft)	Local Community (More than 10 Based Aircraft)	Recreation or Remote	Seaplane Base
Anacortes	No. of Carriers	1	-		-	
Boeing Field/ King County International	No. of Carriers	6	-		-	
	2005 Enplaned Tons	45,630	-		-	
Grant County International	No. of Carriers	2	-		-	
Kenmore Air Harbor	No. of Carriers	-	-		-	
Omak	No. of Carriers	-	2		-	
	2005 Enplaned Tons	-	125		-	
Pangborn Memorial	No. of Carriers	5	-		-	
Pullman/Moscow Regional	No. of Carriers	1	-		-	
Richland	No. of Carriers	-	1		-	
Sea-Tac International	No. of Carriers	15	-		-	
	2005 Enplaned Tons	338,657	-		-	
Skagit Regional	No. of Carriers	-	1		-	
	2005 Enplaned Tons	-	1,060		-	
Spokane International	No. of Carriers	5	-		-	
	2005 Enplaned Tons	55,347	-		-	

Figure 60 shows that air cargo demand is concentrated at a limited number of airports in the state. This implies that the majority of cargo is shipped by truck or operates on a Regional/feeder airline basis from most small communities to Sea-Tac or Boeing Field/King County International, and to a lesser extent Spokane International. As is often the case, air cargo is consolidated and shipped via points where lift capacity (widebody aircraft) is available and frequent service is offered. Air Cargo demand is dictated by the cost of an operation (air, surface, port) and the time-sensitive nature of goods and the shippers willingness to pay a premium for air service. Because Sea-Tac and Boeing Field/King County International have frequent daily, widebody service they serve the majority of Washington State's air cargo needs currently.

Omak and Skagit volumes warrant further examination during Phase II. Are the activity levels being reported representative of opportunities and trends that could develop into the future and that can be leveraged by other airports or are they specific, unique market driven situations contained to these airports?

Air Cargo Service Key Findings

Cargo activity concentrated at Sea-Tac, Spokane International and Boeing Field. Cargo tonnage is also recorded at Skagit Regional and Omak and should be evaluated further. Remaining airports are served by cargo airlines operating small package feeder aircraft.

3. Which Facilities and Services are Available at Washington's Airports?

Washington Airport Services and Aviation-Related Activities

Data on the type of aviation-related services and activities taking place at Washington airports was collected during the survey process. The individual airport data has been consolidated and summarized in Figures 61 and 62 on the following pages. In the figures, the number of airports reporting the service or activity is identified. This is an indicator of existing services in Washington's aviation system. Phase II of LATS will evaluate capacity to determine if existing facilities are sufficient to meet expected demand for these services and activities in the next 20 years.

The services listed represent a wide range of aviation-related business activities that support the needs of both based as well as transient aircraft. The availability of the services listed in the table contributes to the overall attractiveness and viability of the facility. In addition, they represent a potential source of revenue to the airport owner/operator through such means as land leases and fuel flowage fees, or other income such as tie-down fees.

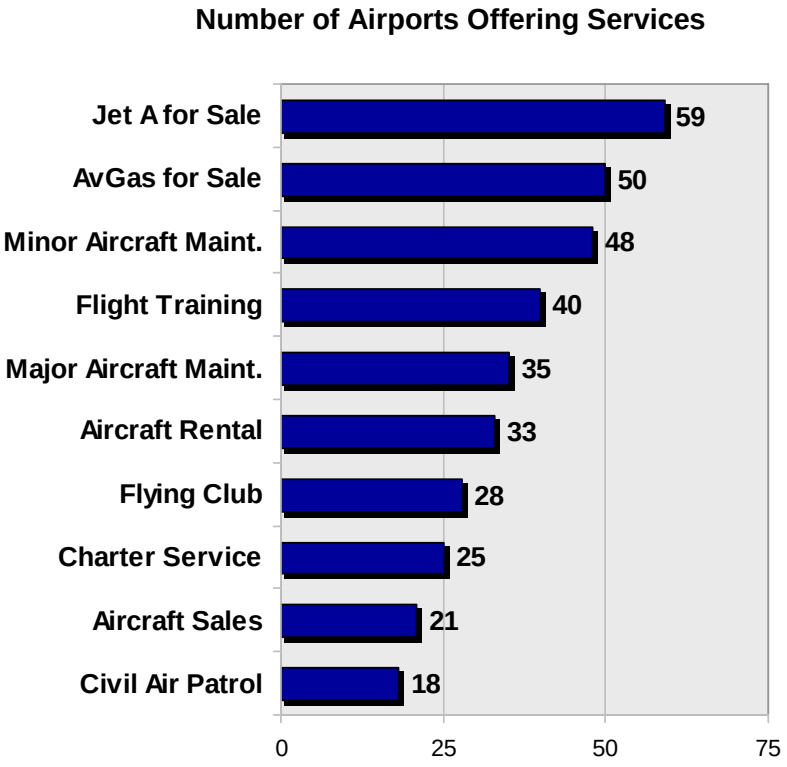
As is apparent from Figure 61, in most instances it is the Regional Service Airports that provide the greatest level of service to the general aviation community. This is a logical finding in that the Commercial Service Airports are managed more to address the needs of commercial aviation and consequently have facilities and pricing structures which exceed the needs of a large segment of the general aviation community.

The summary table also shows that many of Washington's airports offer a number of aviation related services within the state but that pilots based at small airports may have to travel to one of the regional service airports to gain access to certain services. FBOs at the largest airports are able to offer a variety of services that FBOs in smaller markets are not. One area of further research may be to explore whether the FBO business health is a better indicator of corporate jet activity than the number of based aircraft.

Figure 61: Number of Airports with Specific Services and Activities

	Commercial Service	Regional Service	Local Community >10	Local Community <10	Recreation or Remote	Seaplane Base	System Total
Major Aircraft Maintenance	10	12	8	1	3	1	35
Minor Aircraft Maintenance	10	16	16	1	5		48
Avionics	6	5	2		2	1	16
Aircraft Rental	10	13	7	1	2		33
Aircraft Sales	6	7	5		2	1	21
Flight Training	10	14	9	3	3	1	40
Charter Service	11	10	1	1	1	1	25
US Customs	5	5	2			1	13
Food Service	5	9	3				17
Lodging	1	3	1				5
Flying Club	3	11	10	1	3		28
Wildland Firefighting	2	5	1		1		9
Civil Air Patrol	4	9	5				18
Other Search/Rescue/ Disaster Assistance	1	5	3	1	1		11
Law Enforcement	4	3	5		1		13
Air Show		3	1				4
Skydiving/Parachute Drops		4	1				5
Agriculture Spraying	2	2	8	3	1		16
Aerial Surveying		5	2	1	1		9
Airplane / Parts Manufacturing	5	6	1	1	3	1	17
Military Aircraft Activity	5	4	1		1		11
Fuel Sales							
– Jet A for Sale	10	16	10	5	16	2	59
– AvGas for Sale	12	16	15	2	4	1	50

Figure 62: Top 10 Services at Airports Statewide



Airport Services and Aviation-Related Activities Key Findings

Although Regional Service airports have fewer annual operations, they tend to provide more aviation services and activities for general aviation pilots, including: major and minor maintenance, fuel sales and aircraft rental.

Airport Reference Code

Each airport in the state system is assigned an Airport Reference Code (ARC) designation. The FAA's Airport Reference Code is a classification system developed to relate airport design criteria to the operational and physical characteristics of the airplanes expected to operate at the airport. A Critical Aircraft is selected for each airport, which is the most demanding aircraft expected to generate 500 or more itinerant operations per year. The ARC is used to identify capital facility improvements necessary to adequately serve that aircraft. A review of current ARC designations for Washington's aviation system is an indicator of which airports are expected to serve various sizes of aircraft, and the types of improvement projects that will be required.

The ARC is based on two key characteristics of the designated Critical Aircraft (Figure 63 on the next page). The first characteristic, denoted in the ARC by a letter, is the Aircraft Approach Category as determined by the aircraft's approach speed in the landing configuration. Generally, aircraft approach speed affects runway length, exit taxiway locations, and runway-related facilities. The ARC approach speed categories are as follows:

- Category A: Speed less than 91 knots;
- Category B: Speed 91 knots or more, but less than 121 knots;
- Category C: Speed 121 knots or more, but less than 141 knots;
- Category D: Speed 141 knots or more, but less than 166 knots; and
- Category E: Speed 166 knots or more.

The second ARC component, denoted by a Roman numeral, is the Airplane Design Group. The Airplane Design Group is defined by the aircraft's wingspan and determines dimensional standards for the layout of airport facilities, such as separation criteria between runways and taxiways, taxi lanes, buildings, or objects potentially hazardous to aircraft movement on the ground. The Airplane Design Group categories include:

- Design Group I: Wingspan up to but not including 49 feet;
- Design Group II: Wingspan 49 feet up to but not including 79 feet;
- Design Group III: Wingspan 79 feet up to but not including 118 feet;
- Design Group IV: Wingspan 118 feet up to but not including 171 feet;

- Design Group V: Wingspan 171 feet up to but not including 214 feet;
- Design Group VI: Wingspan 214 feet up to but not including 262 feet.

Figure 63: Airport Aircraft Reference Codes

Note: Aircraft pictured are identified in bold italic type
Source: W&H Pacific

The number of state system airports within each ARC is listed in Figure 64. The ARCs listed represent those currently applicable. Subsequent analyses will determine whether each airport's ARC should be revised once the demand forecasts have been completed.

Figure 64: Number of Airports by Airport Reference Code

Airport Reference Code (ARC)	Commercial Service	Regional Service	Local Community (Less than 10 Based Aircraft)	Local Community (More than 10 Based Aircraft)	Recreation or Remote	Seaplane Base	State System Total
A-I			1	1	1		3
A-I (small)	4	2	13	14	45	9	87
A-II		3	1	1	1		6
B-I	1		3				4
B-I (small)			9	5			14
B-II		9	3				12
B-III	2						2
C-II		2					2
C-III	4						4
C-IV	1						1
D-II		1					1
D-V	3						3
E-V		1					1
Total	**15**	**18**	**30**	**21**	**47**	**9**	**140**

Figure 64 - Shows that most airports in the state are designed for use by small aircraft (BII or smaller). Does this mean that private aviation facilities in the state are more plentiful than commercial facilities? The distribution implies a healthy and safe operational environment for private pilots but suggests that most communities do not have facilities that can be used by corporate aircraft on a regular basis.

Airport Reference Code Key Finding

A majority of Washington's airports are designed for use by small aircraft and the large aircraft in categories D-V & E-V can only be accommodated at four airports.

Washington Airport Approach Capabilities

Airport approaches are either visual or instrument. Visual approaches are the least technical. Airports that have visual approaches can be used by pilots of all skill levels, and can be used in good weather conditions where pilots can fly by sight. Instrument approaches provide technologies that allow qualified pilots to fly using aircraft instrument controls rather than relying solely on sight. The two levels of instrument approaches are Precision and Non precision. Airports with instrument approaches allow access in varying weather conditions and provide greater capacity. A review of the types of approaches available at Washington's airports allows analysis to identify areas that are adequately or inadequately served by all-weather aviation access, and is used in capacity evaluation.

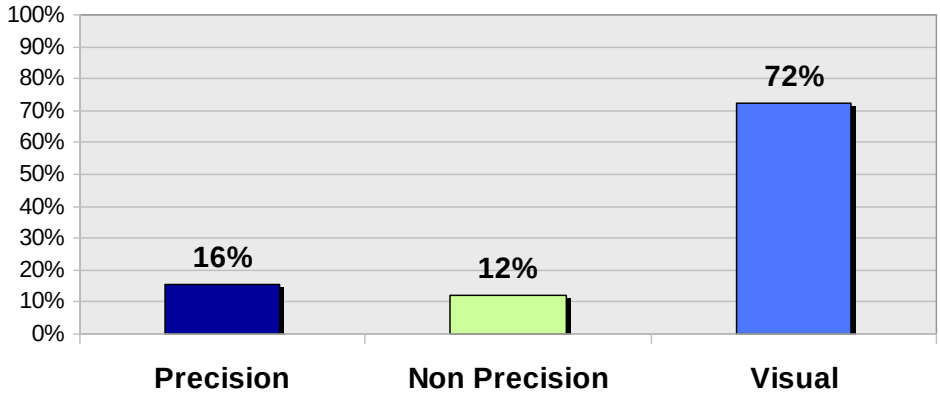
State system airports were surveyed to determine the highest existing instrument approach capabilities currently provided at the airport. Instrument approach capabilities were categorized as either Precision or Non precision based on the approach(es) available at the airport. Airports without instrument approach capabilities were categorized as Visual. Where different runway ends support different approach capabilities, the highest degree of precision available was requested from the airport. The level of precision assigned to an airport is to determine the existing conditions and makes no judgment as to any potential future or enhanced instrument approach capabilities at the facility.

The number of state system airports supporting Precision and Non precision instrument approaches is presented by service level classification in Figure 64 below. Not surprisingly, it is the Commercial Service Airports that have the greatest number of precision approaches of airports system-wide. The data indicate that most airports in the state have only visual approaches (including two of the commercial service facilities - probably seaplane bases). This is typical in a system dominated by BII and smaller facilities. The emerging technologies that are being developed and applied to instrument flying however would suggest that over the next several years the number of available instrument approaches will increase.

Figure 65: Instrument Approach Capabilities

Capability	Commercial Service	Regional Service	Local Community (Less than 10 Based Aircraft)	Local Community (More than 10 Based Aircraft)	Recreation or Remote	Seaplane Base	State System Total
Precision	11	6			4	1	22
Non Precision	2	9	4	1	1		17
Visual	2	3	26	20	42	8	101
Total Number of Airports	**15**	**18**	**30**	**21**	**47**	**9**	**140**

Percent of Washington Airports by Visual Approach Capabilities



Instrument Approach Capability Key Findings

A majority of Commercial Service airports have precision approach capability, supporting 24-hour, all-weather access. Precision approaches are also provided at six Regional Service airports and four Recreation or Remote airports. The majority of Washington's airports use visual approaches and cannot support 24-hour, all-weather access.

Washington Airport Airside Facilities Available

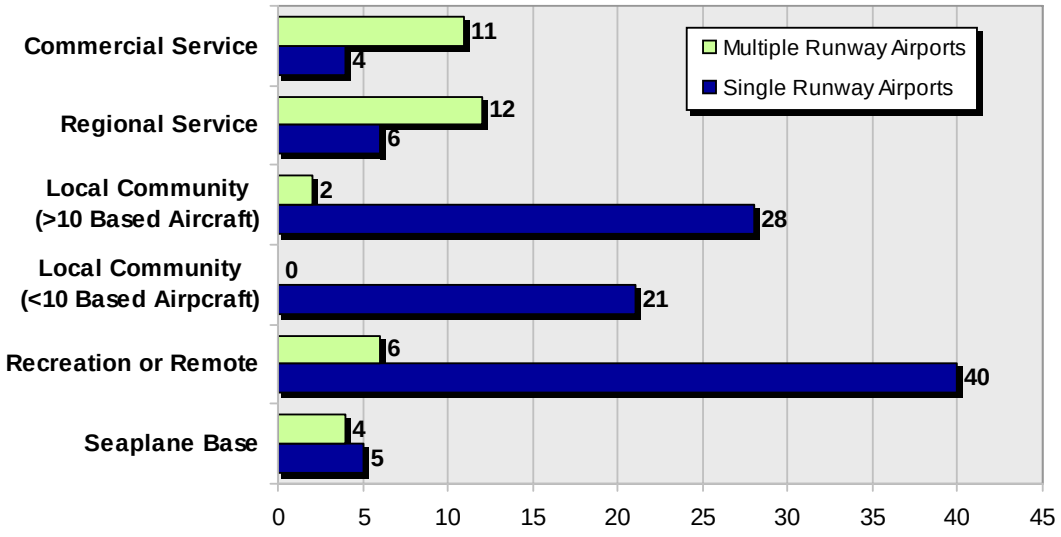
Airport data collected during the survey provided runway and taxiway data that will be used in subsequent capacity calculations for each airport. The number of runways indicates total system capacity, while runway length and pavement condition are indicators of the type of aircraft served. Figure 66 includes, summarized by proposed State Airport Classification:

- Number of runways provided at airports within the state system
- Longest runways available
- Number of airports providing only a single runway
- Number of airports providing multiple runways
- Breakdown of runway lengths into five categories, from less than 3,000 feet to 10,000 feet or greater

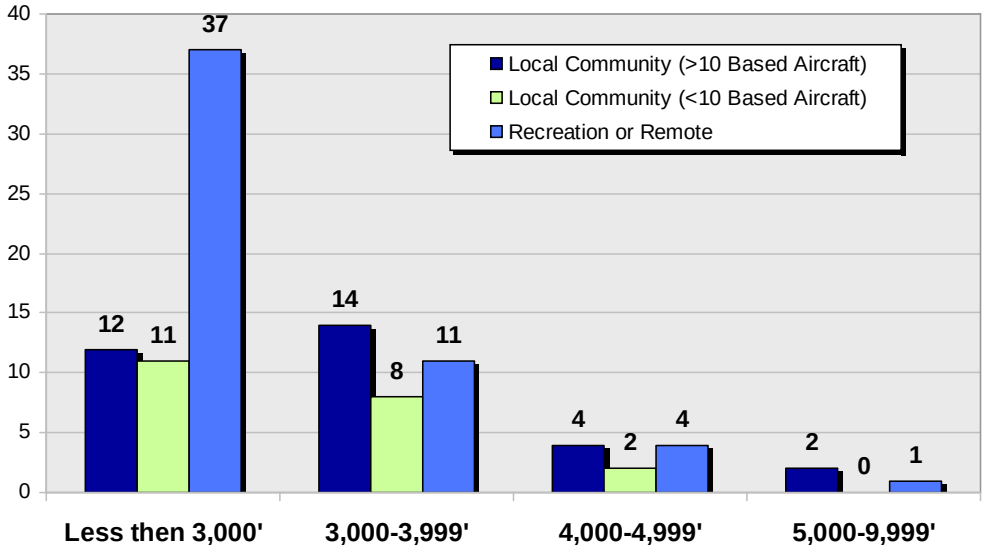
Figure 66: Airside Facilities

Capability	Commercial Service	Regional Service	Local Community (Less than 10 Based Aircraft)	Local Community (More than 10 Based Aircraft)	Recreation or Remote	Seaplane Base
Total Runway Count	31	35	32	21	53	13
Longest Runway	13,502	9,010	6,700	4,199	5,049	12,000
Single Runway Airports	4	6	28	21	40	5
Multiple Runway Airports	11	12	2		6	4
Runway Lengths						
Less than 3,000’	3	6	12	11	37	3
3,000 to 3,999’	7	7	14	8	11	
4,000 to 4,999’	3	9	4	2	4	
5,000 to 9,999’	13	13	2		1	6
10,000’ or Greater	5					4
Total Runway Count	**31**	**35**	**32**	**21**	**53**	**13**
Longest Runway	**13,502**	**9,010**	**6,700**	**4,199**	**5,049**	**12,000**

Runway Counts Statewide by State Classification



Runway Lengths Statewide by State Classification



Airside Facilities Key Findings

A majority of multiple runway airports in Washington State are in the Commercial Service and Regional Service classifications. A majority of Washington's airport runways are 3,000 feet long or less.

Pavement Condition

Pavement condition is measured and tracked to develop strategies for maintenance and rehabilitation that result in the lowest life cycle cost for paved facilities in Washington's aviation system. The importance of identifying the type of repair and optimal time of repair is critical for overall system performance and for managing improvement costs because there is a point in a pavement's life cycle where the rate of deterioration increases. The financial impact of delaying repairs beyond this point can be severe.

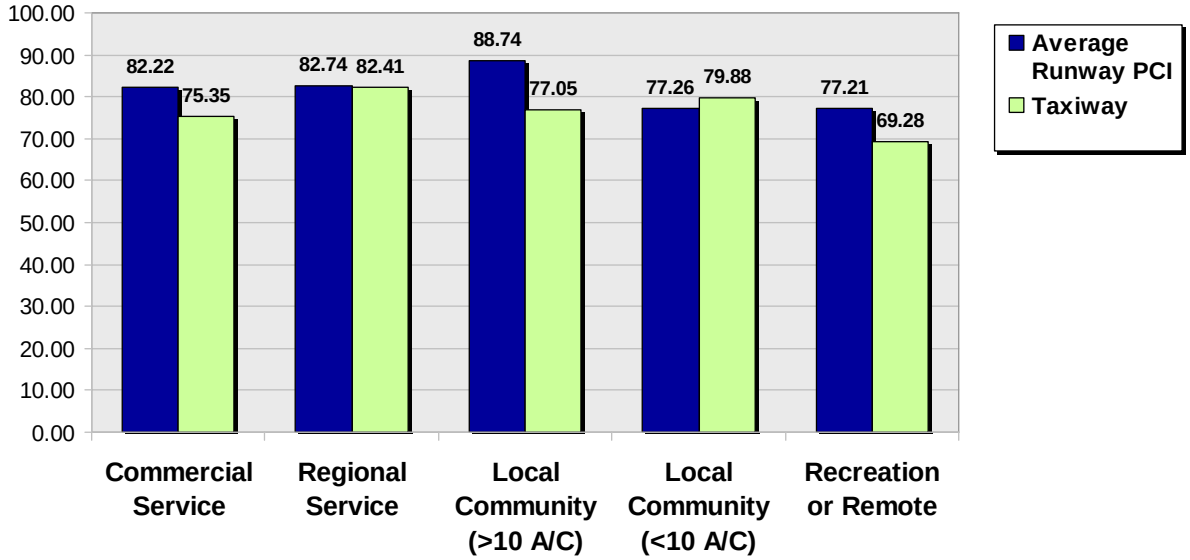
The FAA standard for monitoring the condition of airport pavements is the pavement condition index (PCI) system. This pavement evaluation system establishes a pavement condition index number between one and 100 for each section of pavement. Pavements considered to have excellent conditions have a high PCI index numbers, and those in poor condition have low index numbers. The types of distress identified during the PCI inspection provide insight into the cause of pavement deterioration. Understanding the cause of pavement distress helps in selecting a rehabilitation alternative that corrects the cause and eliminates its recurrence. Monitoring, documenting and maintaining PCI index help support the overall airport system and allow for systematic prioritization of maintenance decisions/treatment and repair.

Figure 67: Average Airport PCI Values

		Local Community				
	Commercial Service	Regional Service	(>10 Based Aircraft)	(<10 Based Aircraft)	Recreation or Remote	Seaplane Base
Max Runway PCI	100	100	100	100	100	-
Average Runway PCI	82.22	82.74	88.74	77.26	77.21	-
Min Runway PCI	45.37	55.28	50.45	13	42	-
Max Taxiway PCI	86.56	91.87	100	100	100	-
Average Taxiway PCI	75.35	82.41	77.05	79.88	69.28	-
Min Taxiway PCI	57.48	66.22	21.34	25.8	36.84	-

Source: WSDOT Aviation PCI Study by Applied Pavement Technology, July 2006

Figure 68: Average Runway and Taxiway PCI by Washington State Airport Classifications (2005)



Note: Avg Pavement Condition Index (PCI) for runways, 100 represents new pavement, 0 completely failed

Pavement Condition Key Findings

On average, Washington's runway pavements are in good condition. Overall runway pavements in the state system are performing slightly better than taxiway pavements.

Washington Airport Aircraft Parking

The ability of Washington airports to accommodate aircraft on the ground will be an important factor in determining both individual airport as well as state system capacity. It indicated the ability to accommodate visiting aircraft, passenger traffic and cargo activity. In Figure 69 below, the total square footage of terminal and cargo apron available to support commercial operations is presented by proposed State Airport Classification. In addition, the total number of apron and transient tie down positions for based and transient aircraft are also summarized.

Figure 69: Aircraft Parking

	Commercial Service	Regional Service	Local Community (Less than 10 Based Aircraft)	Local Community (More than 10 Based Aircraft)	Recreation or Remote	Seaplane Base	State System Total
Terminal Apron (Sq. Ft.)	975,400	413,042	10,000	20,000	8,000	-	1,426,442
Cargo Apron (Sq. Ft.)	5,235,500	456,000	-	-	-	-	5,691,500
No. of Apron Tie downs	571	989	409	49	155	68	2,241
No. of Transient Tie downs	314	490	228	87	155	5	1,279
Total No. of Tie downs	**885**	**1,479**	**637**	**136**	**310**	**73**	**3,520**
Total Parking Apron (Sq. Ft.)	**7,777,353**	**4,281,341**	**2,830,090**	**517,480**	**375,320**	**1,000**	**15,782,584**

Airport Aircraft Parking Key Finding

System-wide, there is significant square footage for cargo at Commercial Service and Regional Service airports.

Washington Airport Landside Facilities

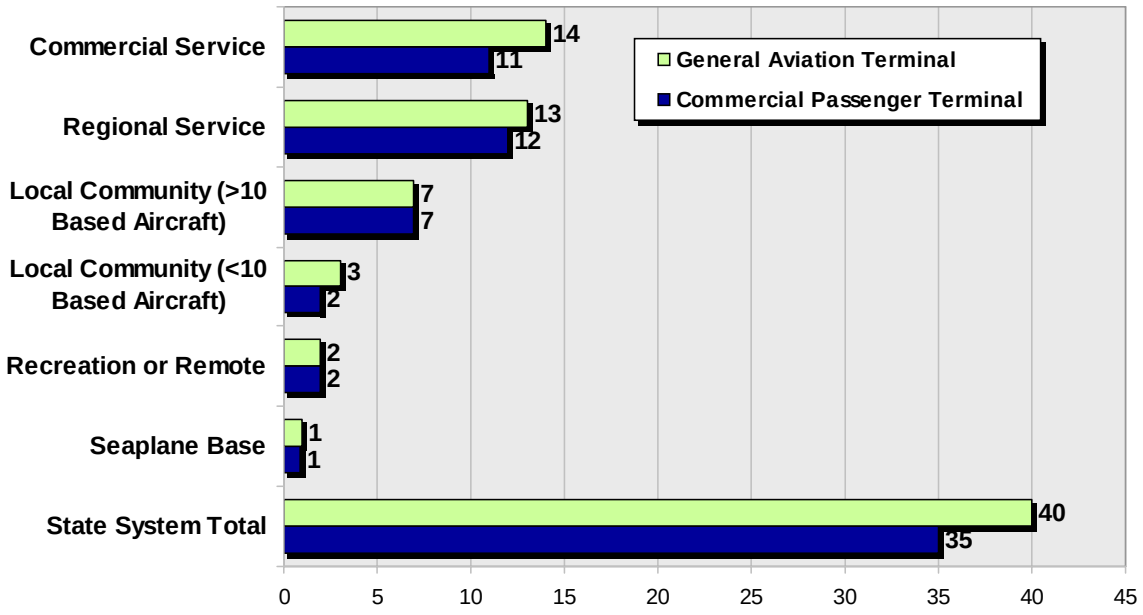
The final data set summarized in this overview addresses the number of airports throughout the state providing passenger and/or general aviation terminal facilities. The total number of hangars reported at system airports are also presented and categorized by hangar door opening - less than 50 feet, greater than 50 feet, or other to indicate the size of aircraft that can be accommodated. Lastly, the total number of public automobile parking spaces available are presented. These measures are indicators of the capacity of the aviation system to accommodate commercial service and general aviation activities.

As the survey showed, 35 airports in the state have passenger terminals for commercial activity and 40 have general aviation terminals regardless of the category of the airport. These facilities provide for a high level of service for airport users in the state, whether they are based within the state or visiting from outside the area. Also, there are more than 3,894 hangars available at airports across the state. Follow-up phone calls to the airport mangers revealed that some of the hangars classified as "other" housed more than one aircraft.

Figure 70: Landside Facilities

	Commercial Service	Regional Service	Local Community (Less than 10 Based Aircraft)	Local Community (More than 10 Based Aircraft)	Recreation or Remote	Seaplane Base	State System Total
Commercial Passenger Terminal	11	12	7	2	2	1	35
General Aviation Terminal	14	13	7	3	2	1	40
Individual Hangar <50'	298	1,617	415	29	232	1	2,592
Individual Hangar >50'	181	378	213	14	17	-	803
Other Hangars	212	78	176	15	18	-	499
Public Auto Parking	19,145	1,642	532	125	179	102	21,725

Washington Airports by Passenger and GA Terminals



Airport Landside Facilities Key Findings

The majority of hangars available systemwide are located at Regional Service airports. Terminals for passenger and general aviation are concentrated at Commercial Service and Regional Service airports.

Summary of Minimum Criteria at All Airports

The previous section presents an overview of the Washington State aviation system, using the framework of the proposed state airport classifications to present a general understanding of who operates the airports, what is happening at the airports, and which facilities and services are available at the airports. The following assessment evaluates how well the airport system is performing, also using the framework of the proposed State Airport Classifications. This performance assessment of airport facilities and services relates to the type, rather than the amount of aviation activity. The amount of aviation activity—airport capacity--is addressed in Part 4 of this report.

The state classification system identifies minimum criteria that apply to all public-use airports, and specific minimum criteria appropriate to the role and function of airports assigned to each classification level.

How is the System Performing on Minimum Criteria that Apply to All Airports?

WSDOT Aviation proposed the following minimum criteria for all public use airports:

- Visual navigational aids (rotating beacon, segmented circle, and wind cone)
- Local support
- Operational safety issues
- Compatible land use policies and zoning

Visual Navigational Aids

Airport visual aids are used to provide information and guidance to pilots maneuvering on airports. These aids may consist of single units or complex systems of many parts and are adapted to each individual airport. As airports provide a unique working environment, with aircraft traveling at high speeds, multi directions, and under a variety of weather conditions, maintaining a uniform system of navigational aids provides for a safer and more efficient aviation environment. Visual Navigation Aid systems support safe operations.

- A rotating beacon is a lighting system that supports nighttime operations. The systems are not required unless the airport is approved for night operations or has a published instrument approach.
- A segmented circle is a system of visual indicators designed to provide traffic pattern information at airports without operating control towers.
- A wind cone provides pilots with a visual cue of the strength and direction of the wind at the landing surface.

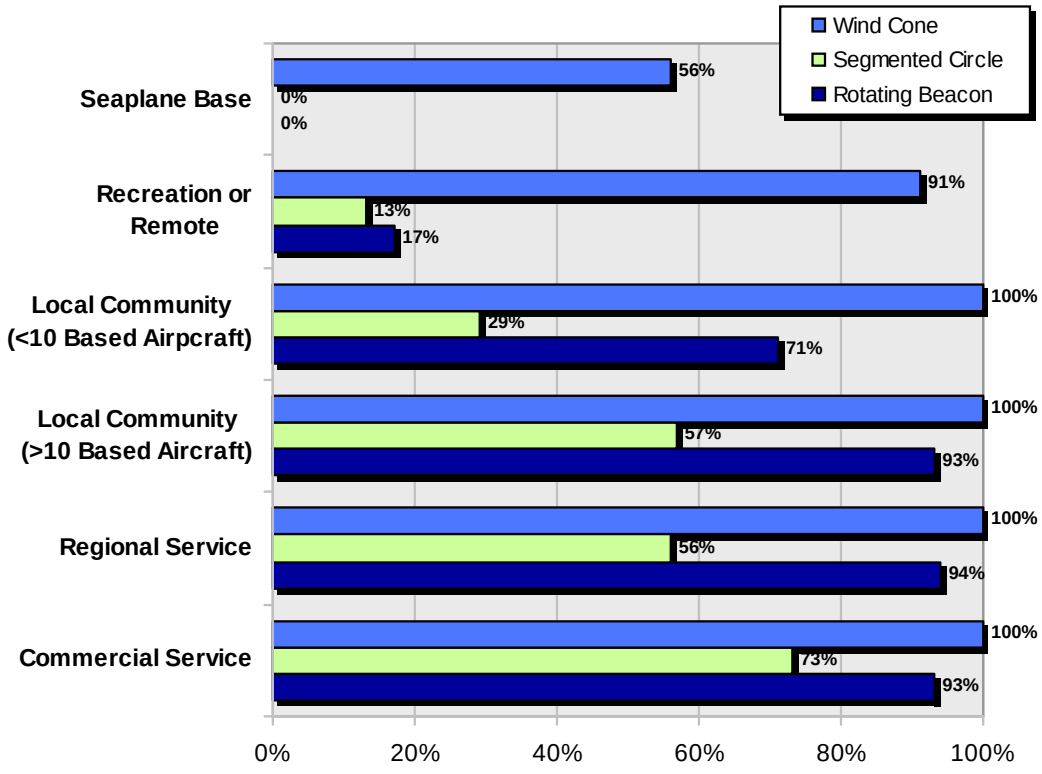
Figure 71 indicates the percentages of airports that have rotating beacons, segmented circles, and wind cones. Seaplane Bases are the most deficient regarding the visual navigational aids criteria. Most are used in daylight hours only, so a rotating beacon is not required. Also, it is difficult to provide a wind cone and segmented circle near the landing area when the landing area is water. Few of the Recreation or Remote Airports have rotating beacons or segmented circles. Some Recreation or Remote

Airports are not used at night so a rotating beacon is not required; also, they may have so little traffic that a segmented circle is unnecessary.

Figure 71: Visual Navigational Aids – Airports Meeting the Criteria

	Commercial Service	Regional Service	Local Community (Less than 10 Based Aircraft)	Local Community (More than 10 Based Aircraft)	Recreation or Remote	Seaplane Base	State System Total
Rotating Beacon	93%	94%	93%	71%	17%	0%	59%
Segmented Circle	73%	56%	57%	29%	13%	0%	36%
Wind Cone	100%	100%	100%	100%	91%	56%	94%
Rotating Beacon	93%	94%	93%	71%	17%	0%	59%

Airports by State Classification and Visual Navigational Aids



Visual Navigational Aids Assessment Key Findings

With the exception of Seaplane Bases, all Washington airports have a high compliance for providing a wind cone (91-100%). Commercial Service, Regional Service and Local Community airports with ten or more based aircraft report high compliance in providing a rotating beacon. Significantly fewer airports have a segmented circle. The highest numbers of these visual indicators are available at Commercial Service airports.

Local Support

This measure is an indicator of a community's ability and willingness to support maintenance and improvement of its airport. Local Support is not easy to quantify; however, the ability to finance the local share of federal and state airport improvement grants is one indicator.

Roughly half the public use airports reported medium or high ability to match grants. About three-fourths of the Commercial Service, Regional Service, and Local Community (at least 10 Based Aircraft) Airports reported medium or high ability to match grants. Not surprisingly, the ability to match grants is lower at the smaller airports.

Financial support is only one component of local support, however. Because the grant match amount is so low, typically five percent of an AIP-funded project at a NPIAS airport, local match money is relatively easy to obtain. The support of politicians, civic organizations, and neighborhood is a factor. Do these groups support airport expansion as well as preservation? Phase III of LATS will address this question for airports that are expected to require additional capacity.

Operational Safety Issues

Many airports in the aviation system do not currently meet many of the FAA standards for airport runway width, taxiway separation and other issues that contribute to a safe aviation system. Determining that an airport has no operational safety issues is difficult to measure. In 2003 an extensive effort was conducted to assess existing airport conditions with minimum FAA standards. The development of airport master plans and airport layout plans has also helped to identify issues related to confusing taxiway patterns or other factors that increase the potential for collisions and near-misses at airports, referred to as runway incursions.

While the 2003 database contains information about compliance with FAA design standards, detailed analysis of this issue was not undertaken

as part of the 2006 update. Instead, the information was reviewed by the consultant team to determine whether any changes had occurred at the airport since 2003 that could affect the capacity of the facility or the system. This included a review of Master Plans and Airport Layout Plans that had been updated after 2003 and, where necessary, follow-up conversations with airport management.

Statewide, 71 percent of airports report obstruction-free approaches; however, only 40 percent of Commercial Service Airports and 50 percent of Regional Service Airports report their approach surfaces are free of obstructions. This circumstance may be less serious than it appears, because a penetration of the imaginary approach surface is not necessarily hazardous to air navigation, a determination that only the FAA can make.

Because safety is typically the first priority for airport improvement programs, it may be appropriate to identify compliance with critical airport design standards, such as the runway safety area, threshold siting criteria, or obstacle free zones, for future performance assessment.

Compatible Land Use and Zoning

The primary purpose of land use controls around an airport is to protect the airport environs from encroachment that could compromise the integrity of the airport operations, now or in the future. In Washington, state law requires towns, cities and counties to discourage development of incompatible land uses adjacent to public-use airports through adoption of comprehensive plan policies and development regulations. Communities that are considered "fully planning" under Washington's Growth Management Act are also required to recognize those airports as essential public facilities.

Figure 72 indicates that the airport system is not performing very well with regard to these indicators, according to information provided in 2003 and updated in 2006. The factors assessed for compatible land use policies and zoning follow:

- ***The airport zoning designation is appropriate*.** The survey asked respondents to indicate how the airport is zoned. The zoning designations Airport, Industrial, and Public Use are assessed as appropriate zoning and are reported at 41 percent of the airports. Unfortunately, 56 airports' zoning was listed as "Unknown" in the online survey.

- ***Runway protection zones (RPZ) are owned by the airport.*** The RPZ is an area off each runway end whose purpose is to enhance the

protection of people and property on the ground. The RPZ size ranges from eight to 79 acres, depending on the critical design aircraft and the type of approach. FAA design standards prohibit residences and places of public assembly (churches, schools, hospitals, etc) in RPZs. Statewide, 61 percent of the public use airports own the RPZ and are therefore able to control development in that area.

- ***City and County plans include the airport as an essential public facility.*** This is reported for only 17 percent of the airports in the state. Even in the Commercial Service Airport classification, only a third of the airports are designated essential public facilities in city and county plans.

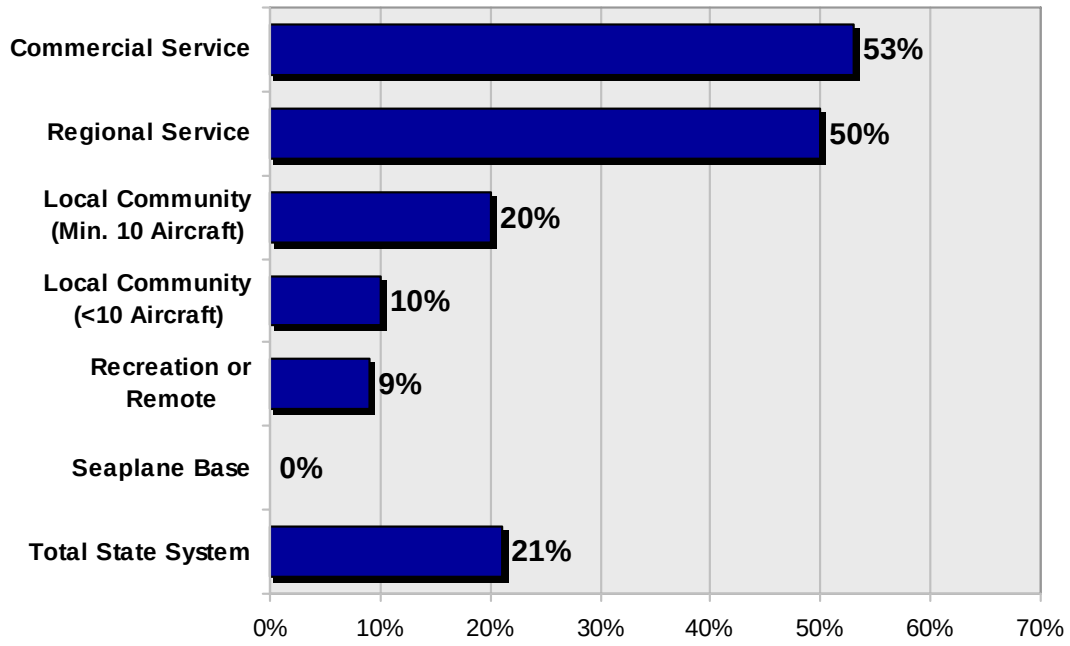
- ***Zoning is in place to regulate height hazards.*** Height hazard zoning is reported at 40 percent of the airports.

- ***Current development regulations prohibit incompatible development adjacent to the airport.*** Only 21 percent of the airports answered yes to this survey question.

Figure 72: Compatible Land Use and Zoning – Airports Meeting the Criteria

	Commercial Service	Regional Service	Local Community (Less than 10 Based Aircraft)	Local Community (More than 10 Based Aircraft)	Recreation or Remote	Seaplane Base	State System Total
Airport zoning designation is appropriate.	80%	67%	63%	33%	15%	0%	41%
Runway Protection Zones (RPZ) are owned by the airport sponsor.	73%	72%	40%	43%	70%	78%	61%
City and County plans include airport as essential public facility.	33%	44%	20%	19%	2%	0%	17%
Zoning is in place to regulate height hazards.	60%	83%	73%	24%	11%	0%	40%
Current development regulations prohibit incompatible development adjacent to the airport.	53%	50%	20%	10%	9%	0%	21%

Airports that Prohibit Incompatible Adj. Dev. By State Classification



Compatible Land Use and Zoning Assessment Key Findings

Overall, many airports are zoned appropriately and own associated Runway Protection Zones. Performance on regulations to discourage development of incompatible land uses is highest among the busiest passenger facilities including Commercial and Regional Service airports, however, a majority of airports system-wide do not meet all minimum criteria for compatible land use and zoning.

Airport Zoning

Appropriate on-airport zoning is also important to protecting airports from incompatible land uses that could compromise the integrity of airport operations. Airport, Industrial, and Public Use are zoning designations that are appropriate for airport property.

Obstructions

Obstructions are objects such as terrain, buildings, trees, and vehicles that could be hazardous to aircraft during takeoff or landing. Imaginary surfaces around runways, which are defined by 14 CFR Part 77, Objects Affecting Navigable Airspace, should be kept clear of obstructions. If construction or vegetation around an airport is allowed to obstruct an imaginary surface, particularly the approach surface, the FAA can impose measures that degrade the usefulness of an airport for safety reasons. A runway threshold might have to be displaced, which would shorten the useable runway. Shortening the useable runway could reduce the types of aircraft that could use the runway or reduce aircraft payloads or fuel loads, which could result in a negative economic impact on the local community and on the aircraft operator. If a runway has an instrument approach, the FAA might raise the visibility minimums for the instrument approach, in order to keep landing aircraft a safe distance above an obstruction. Higher visibility minimums increase the amount of time an airport is closed due to weather, which reduces availability of the airport for emergencies, as well as for business and recreation purposes.

How is the Aviation System Performing On Specific Minimum Criteria Set for Airport Classifications?

The following sections assess the performance of the different airport classifications according to their individual criteria. The criteria proposed for individual airport classifications relate to the same types of facilities and services, but are calibrated to each classification. In other words, the criteria are more demanding for the larger airports.

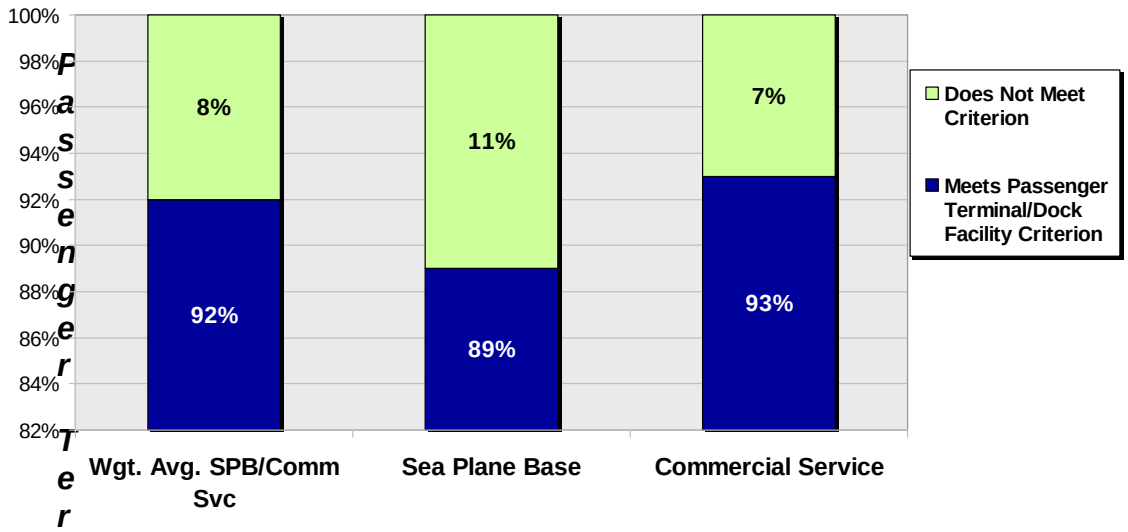
The figures in this section compare how well the different airport classifications are performing with respect to the passenger, runway length, taxiway, runway lighting, approach, vertical glide slope indicator, weather reporting, fuel sales, and maintenance criteria.

Passenger Terminal

Having a passenger terminal is critical to having scheduled commercial service at an airport. Aside from the obvious benefits of protecting travelers in inclement weather, comfort and convenience is part of the travel experience that is a minimum expectation for both airlines and passengers. The objective to have a passenger terminal applies only to Commercial Service Airports, although it would be desirable to have a building for arriving and departing passengers at Regional Service Airports and at the larger Local Community Airports to facilitate future conversion for passenger service, if necessary. Information about the availability of passenger terminals at these other classifications is presented below.

Figure 73 summarizes an assessment of passenger facilities. Only Commercial Service Airports have a criterion to have a passenger terminal, which almost all have. Only one has no building, but requires passengers to load and unload on the apron. Sea Plane Bases have a criterion to have a dock facility, which supports passenger loading and unloading. Most of the Sea Plane Bases have a dock facility.

Figure 73: Passenger Facility Criteria Assessment



Term Passenger Terminal Assessment Key Finding

Most commercial airports and seaplane bases provide passenger terminals.

Runway Length

The runway length performance criterion for each state classification is based on accommodating the type of aircraft and/or the instrument approach level that is appropriate for the airport role. The runway length an aircraft needs depends on a combination of factors, including aircraft performance characteristics, operating weight, temperature, airport elevation, runway gradient, and runway surface condition. In addition, the FAA specifies minimum lengths for runways to have instrument approaches using WAAS and other navigational aids, dependent upon the approach visibility minimums.

Runway length should be determined for the critical design aircraft, which is the most demanding aircraft in regular or substantial use at the airport. The design temperature used in the length calculation is the mean maximum temperature in the hottest month; the design temperatures at Washington airports generally fall between 65 and 85 degrees F. Performance objective for runway length are shown in Figure 74 on the following page

.

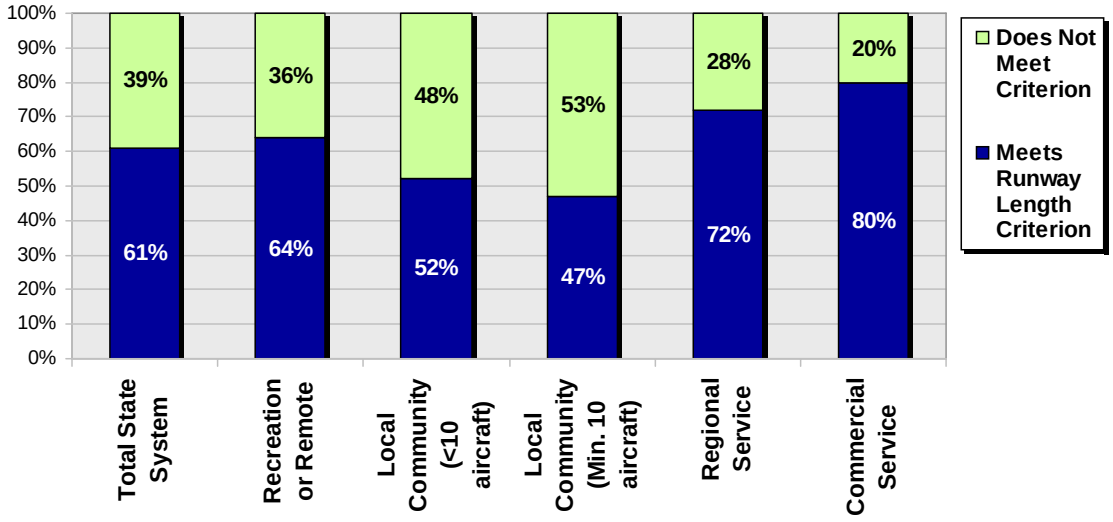
Figure 74: Runway Length Performance Objective

Airport Classification	Runway Length	Purpose
Commercial Service	5,500 feet	Accommodates heavy business jets
Regional Service	5,000 feet	Accommodates medium business jets
Local Community (Less than10 Based Aircraft)	3,200 feet	Required for an instrument approach
Local Community (More than 10 Based Aircraft)	2,800 feet	Length required for 95% of small aircraft
Recreation or Remote	2,400 feet	Length required for 75-95% small aircraft

Note: Longer runway lengths may be justified based on runway length analysis conducted according to the FAA Advisory Circular 150/5325-4B, Runway Length Requirements for Airport Design.

Figure 75 shows that most of Washington's airports meet their runway length criteria, however, every airport classification has significant deficiencies. Less than half of Local Community Airports with at least 10 based aircraft meet the FAA's minimum runway length for an instrument approach (without penalties to the approach visibility minimums). This translates to 16 airports that cannot realize the full benefit of a WAAS approach.

Figure 75: Runway Length Criteria Assessment



Runway Length Assessment Key Findings

System-wide, a majority of airports meet the runway length performance objective. Weakest performance on the runway length objective is among Local Community airports – over half the airports with fewer than ten based aircraft meet or exceed the desired runway length, while 47 percent of airports with ten or more based aircraft meet the objective.

Parallel Taxiway

The taxiway criterion relates to whether or not aircraft must taxi on the runway before takeoff or after landing. The lack of a full-length parallel taxiway connected to both ends of a runway reduces its capacity for aircraft operations. A parallel taxiway enhances safety by reducing the potential of taxiing aircraft colliding with aircraft departing or arriving on the runway. A full-length parallel taxiway is desirable for any airport and considered "fundamental" NPIAS airport development by FAA Order 5090.3C. However, a full-length parallel taxiway can be very expensive to build and a low priority at low-activity airports.

FAA design standards do not require runways to have parallel taxiways except in the following specific circumstances:

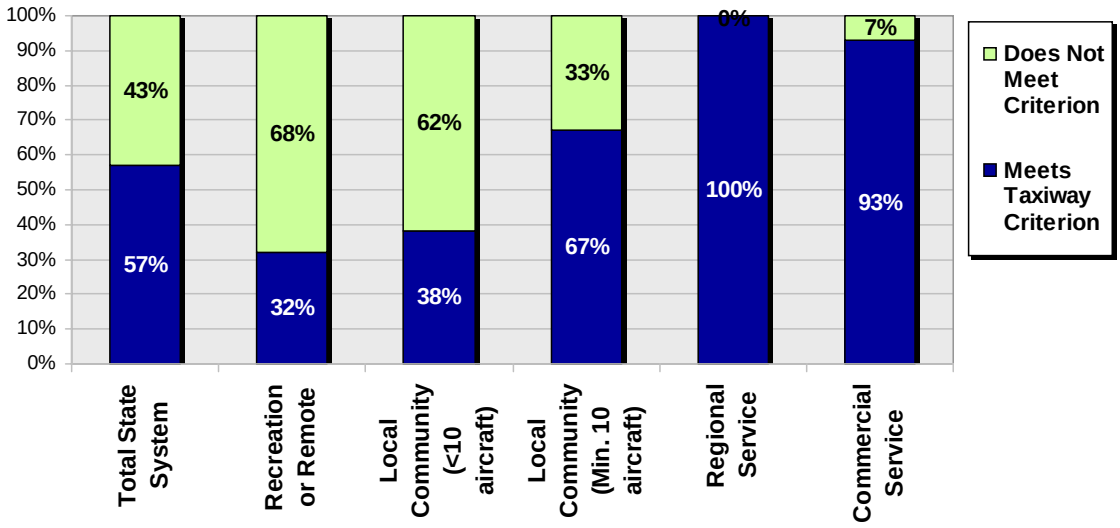
- A parallel taxiway is required for a runway to have an instrument approach with visibility minimum lower than one statute mile. The instrument approach may be one that uses WAAS or other navigational aids. (A parallel taxiway is recommended for runways with higher visibility minimum instrument approaches.)

- One of FAA's runway gradient standards is for a runway to provide line of sight from one end to the other at a point five feet above the runway. If the runway has a full length parallel taxiway, the line of sight requirement is only for each half of the runway.

FAA Order 5100.38C states that a partial parallel taxiway may be considered at NPIAS general aviation airports where the cost to construct the full length is excessive and the benefits do not warrant it. Older FAA and International Civil Aviation Organization (ICAO) criteria used 20,000 to 30,000 annual aircraft operations as an activity threshold for a parallel taxiway. The proposed minimum performance taxiway criterion for smaller airports is to have turnarounds at the runway ends. Turnarounds provide areas suitably surfaced and wide enough for aircraft to turn 180 degrees.

The assessment of taxiway criteria appears in Figure 76. A full-length parallel taxiway is the criterion for the first three classifications, while the criterion for the smaller Local Community and Recreation or Remote airports is a turnaround. Nearly all the Commercial Service and Regional Service airports have parallel taxiways. One-third of the Local Community Airports with at least 10 based aircraft lack a parallel taxiway, which is a requirement for an instrument approach with visibility minimum lower than one statute mile, such as is achievable with WAAS.

Figure 76: Taxiway Criteria Assessment



Taxiway Assessment Key Findings

All Commercial Service airports and most Regional Service airports meet the performance objective for parallel taxiways. A majority of Local Community airports with ten or more based aircraft also meet this performance objective. A minority of airports in the Recreation or Remote and Local Community (with fewer than ten based aircraft) classifications have the desired runway turnarounds.

Runway Lighting

Runway lighting refers to the type of edge lighting provided around the runway. Runway lights help pilots identify the runway location as they approach the airport to land.

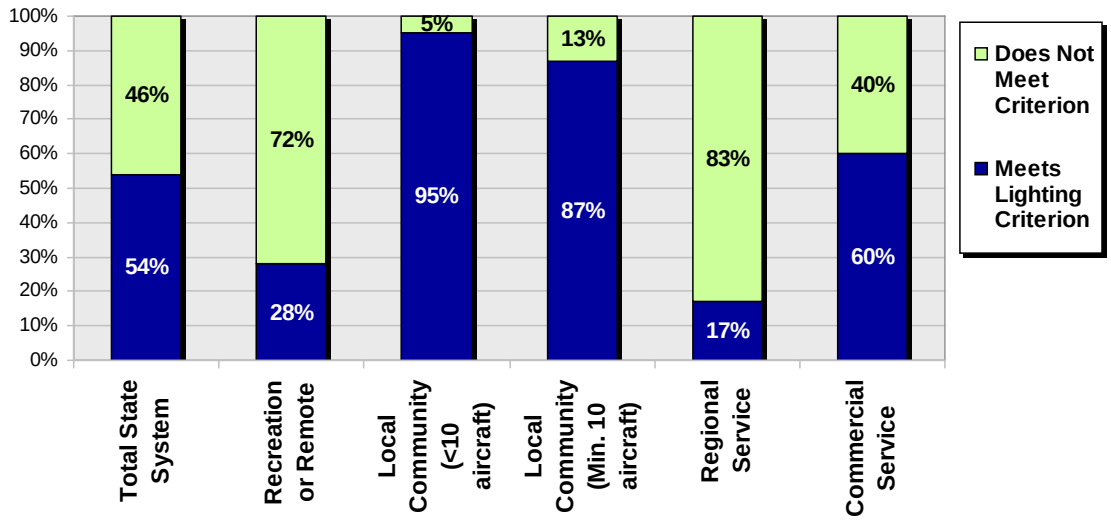
- The FAA requires High Intensity Runway Lighting (HIRL) or Medium Intensity Runway Lighting (MIRL) for instrument approaches with visibility minimums lower than one statute mile using WAAS or other navigational aids.

- MIRL or Low Intensity Runway Lighting (LIRL) is required for instrument approaches with higher visibility minimums, although the FAA recommends installing MIRL instead of LIRL.

Runway lighting also helps pilots see visual runways at night. Where an airport lacks electrical power or where runway lights are not affordable, reflectors can be used to outline a visual runway. The approaching aircraft's lights are reflected, providing the pilot a better view of the runway location.

As Figure 77 shows, the majority of Commercial Service and Regional Service airports do not meet their criteria for runway edge lighting. For the most part, the type of runway lighting at these airports is consistent with FAA lighting requirements, so the criteria should probably be changed from HIRL to MIRL. For precision and other instrument approaches with visibility minimums lower than ¾ mile, the FAA allows either HIRL or MIRL. Most of the airports in the top two classifications assessed as deficient have MIRL instead of HIRL. Atypically, a large number of Local Community airports meet their lighting criteria. However, most of the Recreation or Remote airports lack reflectors.

Figure 77: Lighting Criteria Assessment



Lighting Assessment Key Findings

A majority of Commercial Service and Local Community airports meet performance objective for runway lighting. Weakest performance in this objective is among airports in the Regional Service and Recreation or Remote classifications. Most airports shown as deficient in the Commercial Service and Regional Service classifications have MIRL lighting but not the more advanced HIRL lighting identified in the performance objective.

Approach

The type of runway approach available at an airport—visual or instrument—determines whether or not the airport can be used in rainy, foggy, snowy, and dark conditions. Instrument approaches have ceiling and horizontal visibility minimums that determine how bad the weather can be for the airport to remain open. The minimums define the height above and distance from the airport where the pilot must be able to see the runway before committing to landing. FAA design standards differ according to the horizontal visibility minimum, expressed in statute miles.

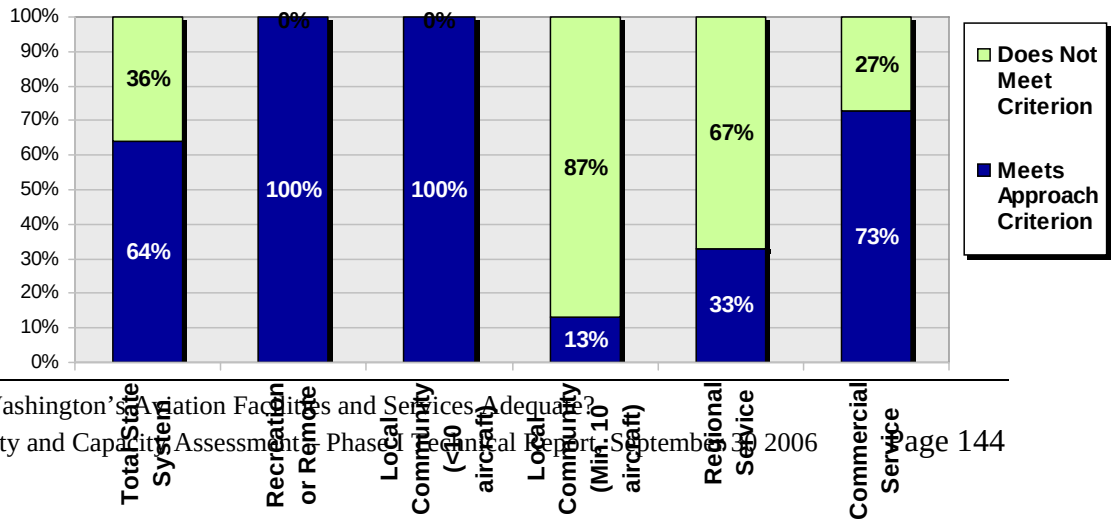
Runway approach instrumentation enhances safety and the level of service. Instrument approaches provide pilots with navigational guidance to ensure they will avoid hazardous obstructions near their path to the runway. Without an instrument approach procedure, a runway can only be used in visual meteorological conditions, which means the pilot can see to avoid terrain and other obstacles while landing. Having an instrument

approach that allows the airport to remain open in most weather conditions increases the reliability of air service, which is vital at Commercial Service Airports. Minimal airport closure due to weather "below minimums" is very important at any airport used for business aviation; business aviation typically flies by Instrument Flight Rules (IFR) all the time. An all-weather airport is also important at smaller airports for medical evacuation and other emergency purposes.

Until Global Positioning System (GPS) satellite navigation became available, ground-based navigational aids were required at or near an airport for it to have an instrument approach. Before GPS, there were only non precision and precision instrument approaches, which used a variety of navigational aids. A non precision approach provides a pilot with two-dimensional guidance to a runway, while a precision approach, such as an Instrument Landing System (ILS), also provides a third dimension--glideslope guidance. GPS-aided approaches are three dimensional. However, until the Wide Area Augmentation System (WAAS) was established in 2003, GPS approaches were only possible for visibility minimums comparable to non precision approaches — one statute mile. WAAS consists of ground-based transmitters located around the country to improve the accuracy of GPS signals. WAAS-aided GPS approaches are possible down to one-half mile visibility minimum—comparable to an ILS.

As Figure 78 shows, Local Community airports with at least 10 based aircraft are the most deficient with respect to the type of approach. This correlates with the fact that many of these airports lack the parallel taxiway, sufficient runway length, and weather reporting equipment needed for an instrument approach. The fact that two-thirds of Regional Service airports lack precision instrument approaches means that they do not meet one of the most desirable factors for business aviation. Local Community Airports with fewer than 10 aircraft and Recreation or Remote airports fully meet the criterion of having visual approaches.

Figure 78: Approach Criteria Assessment



Approach Assessment Key Findings

A majority of Commercial Service airports meet the performance objective and have a precision or ½ mile visibility minimum approach. All Recreation or Remote and Local Community (with less than ten based aircraft) classifications have a visual approach or better. A select number of airports in the Regional Service and Local Community (with ten or more based aircraft) airports meet the performance objective for approach capability.

Vertical Glide Slope Indicators (VGSI)

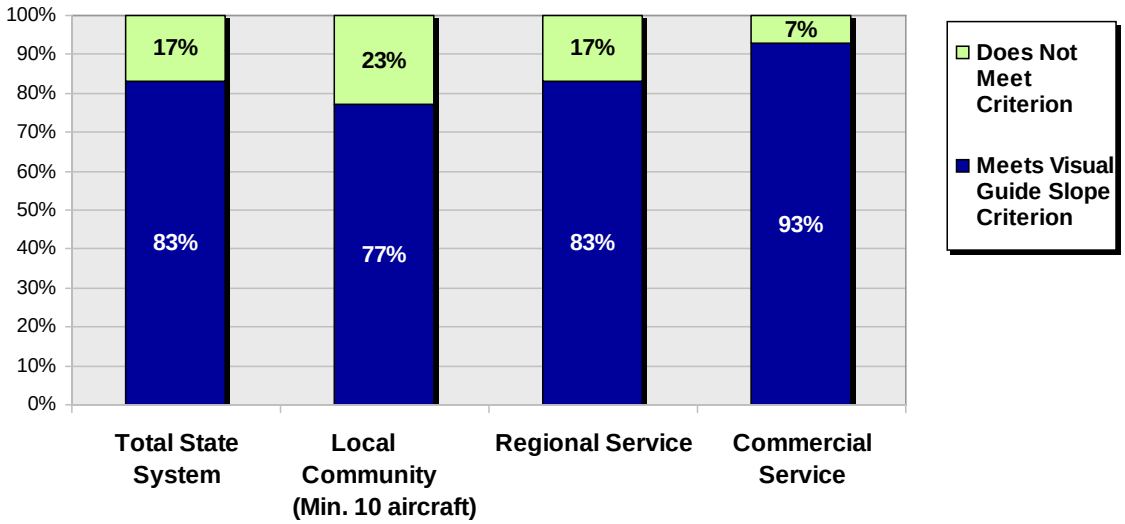
VGSI are navigational aids used during visual approaches. Lights convey to the pilot whether the aircraft is on the appropriate glide path to the runway threshold. Specifically, the various sequences of lights convey to the pilot whether the aircraft is on above, below or on the appropriate glide path to the runway threshold. Several different types of VGSI are in use, including PAPI, VASI, PLASI, and PVASI and are detailed as followed:

- **Precision Approach Path Indicator (PAPI) –** A lighting system located along side of a runway which contains red and white lights configured in a single row.
- **Visual Approach Slope Indicator (VASI)** – A lighting system located along side of a runway which contains red and white lights configured using near and far bars (one row of lights in front of the other).
- **Pulsating Visual Approach Slope Indicator (PVASI) or Pulsating Approach Slope Indicator (PLASI) -** A lighting system located along side of a runway which contains either a steady or pulsating red or white light to indicate glide slope position.

These systems improve safety and functioning of visual approaches and are identified in the performance objectives for Commercial Service, Regional Service and Local Community airports with 10 or more based aircraft.

Figure 79 shows that a high proportion of airports meet their VGSI criterion.

Figure 79: Visual Glide Slope Indicator Assessment



Visual Guide Slope Indicator Assessment Key Finding

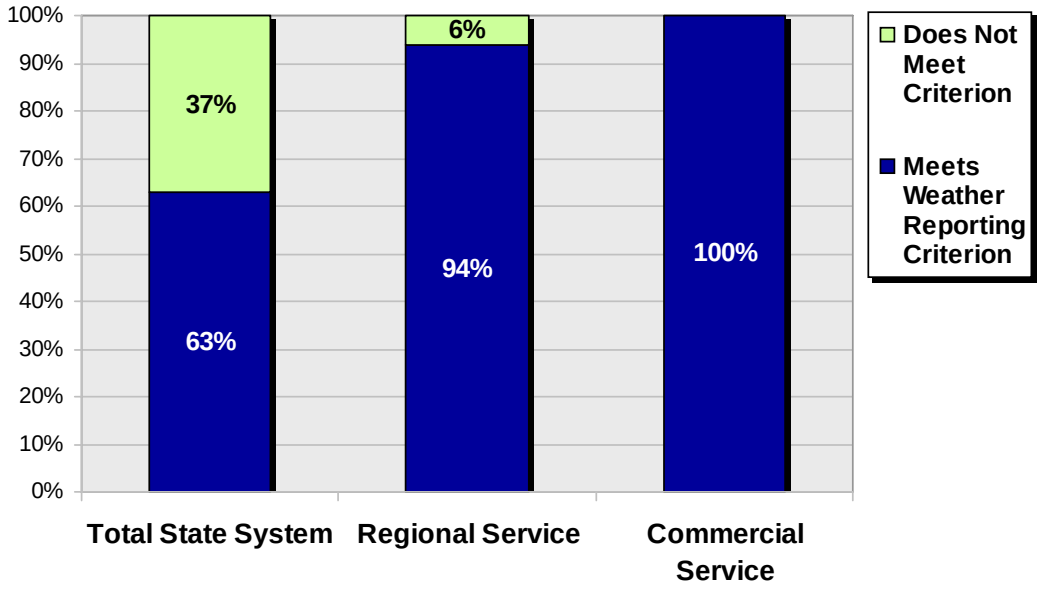
System-wide compliance with this performance objective is high – a majority of Commercial Service, Regional Service and Local Community airports with ten or more based aircraft have the desired systems.

Weather Reporting

Weather reporting on a real-time basis is important to aviation safety, particularly in areas where visibility can decrease quickly. In addition, weather reporting equipment that can provide a certified altimeter reading is required for a runway to have an instrument approach. The types of weather reporting equipment are Automated Weather Observation System (AWOS), Automated Surface Observing System (ASOS), and SuperUnicom, which is a less costly system than AWOS or ASOS that provides pilots with radio checks as well as airport advisories. Weather reporting systems are identified in the performance objectives for Commercial Service, Regional Service and Local Community airports with 10 or more based aircraft. WSDOT is conducting a statewide study to determine where frequent adverse weather conditions may warrant weather reporting equipment at Local Community airports with fewer than 10 based aircraft, at Recreation or Remote airports, or at off-airport locations such as mountain passes.

Figure 80, shows that all the Commercial Service airports and nearly all the Regional Service airports have real-time weather reporting. Most of the Local Community airports with at least 10 based aircraft lack weather reporting systems, which are needed in order to have an instrument approach.

Figure 80: Weather Reporting Assessment



Weather Reporting Assessment Key Findings

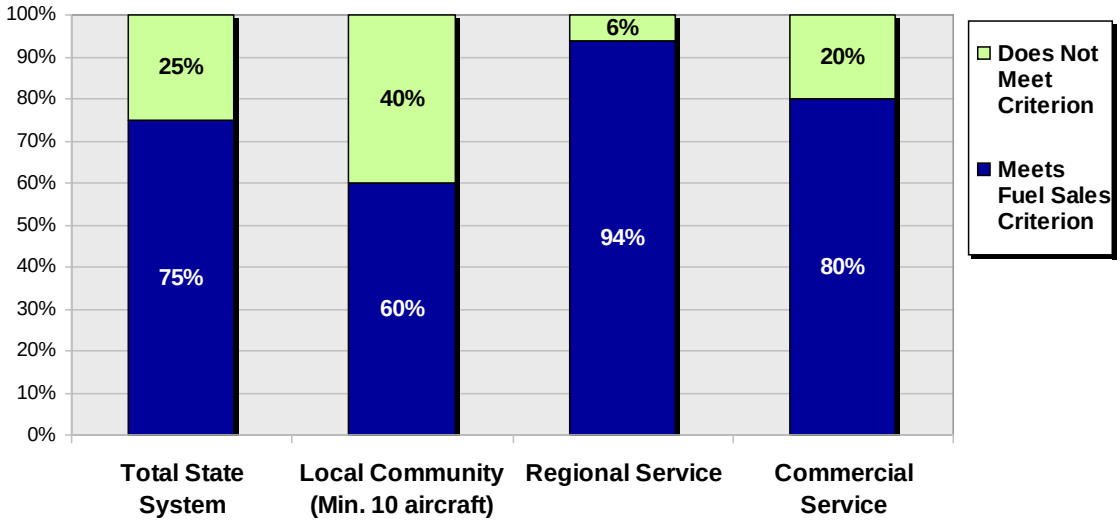
All Commercial Service facilities, and a majority of airports in the Regional Service airports, provide real-time weather reporting. A majority of Local Community airports with ten or more based aircraft do not provide real-time weather reporting.

Fuel Sales

Having fuel available for sale is an airport service that supports the viability of an airport and represents a potential source of revenue for the owner/operator. However, the investment in fuel-dispensing systems and storage is not economically feasible at low activity airports. Airports typically used only by piston-driven aircraft need 100LL (100 octane low lead) fuel available. Airports that are used frequently by jet and turbojet aircraft also need Jet A fuel available for sale. Fuel sales are identified in the performance objectives for Commercial Service, Regional Service and Local Community airports with 10 or more based aircraft.

Figure 81 shows that most of the airports with fuel sales and aircraft maintenance service criteria meet the criteria.

Figure 81: Fuel Sales Assessment



Fuel Assessment Key Findings

Regional Services airports provide the highest availability of fuel sales. Only 60 percent of Local Community airports with ten or more based aircraft provide fuel sales.

Maintenance

Having aircraft maintenance service available is also important, particularly at larger airports. This service provides annual maintenance checks that are required by the FAA for aircraft to operate. Maintenance levels identified for performance criteria are Full-Service Fixed Base Operator (FBO), Major Maintenance, and Minor Maintenance.

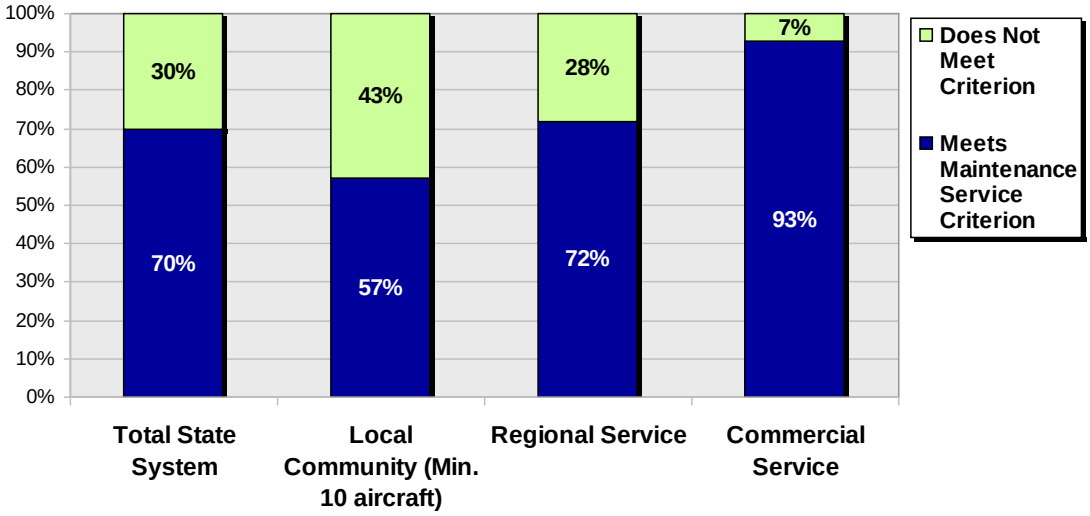
- A Full-Service FBO is understood to be a business at an airport that provides a range of aircraft services, usually in addition to fuel sales. The FAA defines a fixed base operator as "an individual or firm operating at an airport and providing general aircraft services such as maintenance, storage, and ground and flight instruction." In their minimum standards for commercial aeronautical activities, airport owners often establish facility and service thresholds for businesses to be considered FBOs.

- Major Maintenance refers to repairs that may affect weight, balance, structural strength, power plant operations, flight characteristics, or other qualities affecting air worthiness.

- Minor Maintenance is general or preventative maintenance other than major maintenance.

Full-Service FBO and major maintenance service are identified as performance objectives at Commercial Service and Regional Service airports. Minor maintenance is identified as a measure for Local Community Airports with 10 or more based aircraft.

Figure 82: Maintenance Assessment



Maintenance Assessment Key Findings

There is lower availability of maintenance service at Regional Service airports than at Commercial Service airports. Just over half the Local Community airports with ten or more based aircraft provide some type of maintenance service.

How is the Aviation System Performing Based on Objectives Set for Each Classification?

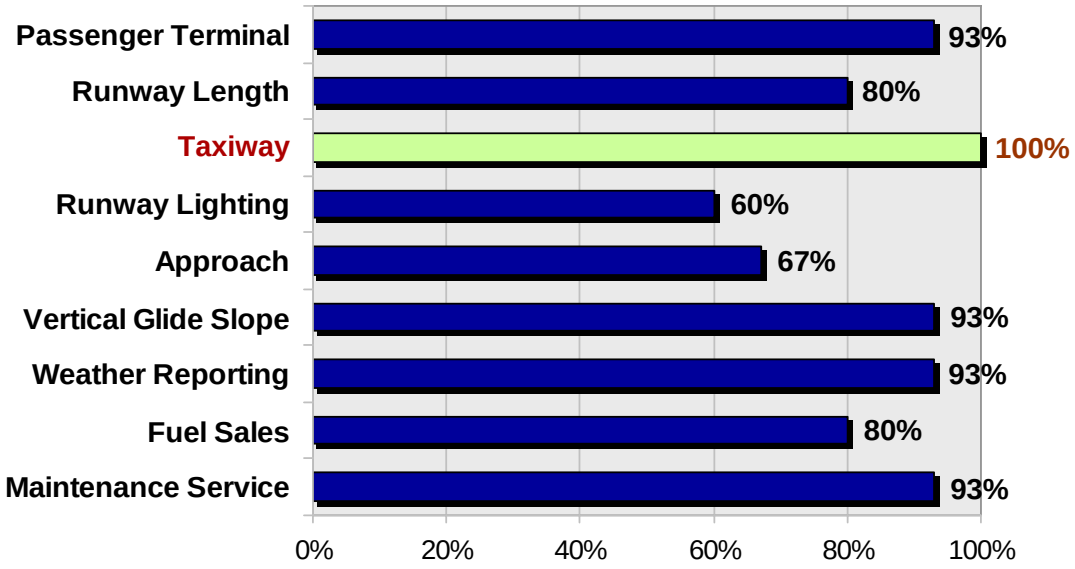
Criteria for Commercial Service Airports

Figure 83 presents the minimum performance criteria proposed for Commercial Service Airports and the percentage of the 15 airports in that draft classification that meet the criteria. The 5,500-foot minimum runway length is the minimum length recommended for heavy business jets (75,000 pounds) by the National Business Aviation Association (NBAA) at standard conditions, where standards are sea level and 59 degrees F. This minimum runway length is also adequate for most regional jets used for commercial passenger service. Airport conditions may warrant a longer runway or an individual airport may require a longer runway for its critical design aircraft.

Figure 83: Performance Criteria for Commercial Service Airports

Criteria	Explanation	Airports Meeting Criteria
Passenger Terminal	Yes	93%
Runway Length	5,500 ft.*	80%
Taxiway	Parallel	100%
Runway Lighting	HIRL	60%
Approach	Precision, or ½ mile visibility minimum	67%
Visual Glide Slope Indicator	Yes	93%
Weather Reporting	AWOS or ASOS	93%
Fuel Sales	100LL and Jet A	80%
Maintenance Service	Full Service FBO and major maintenance	93%

Commercial Service Airports Level of Performance by Criteria



**NBAA minimum recommendation for heavy business jets (75,000 pounds) at standard conditions (59 degrees F and sea level). Airport conditions may warrant a longer runway or an individual airport may require a longer runway for its critical design aircraft.*

Figure 84 lists the airports that do not meet the proposed criteria for Commercial Service Airports. Runway lighting, VGSI, and instrument approach criteria are all inapplicable for Kenmore Air Harbor, Inc. because it is a seaplane base. The airports not meeting the minimum runway length are all airports located in the San Juan Islands and have runways between 2,900 and 3,400 feet long. All the airports lacking HIRL have runway lighting. Anacortes, Orcas Island, Pangborn Memorial, and Wm. R. Fairchild International Airports have Medium Intensity Runway Lights (MIRL), while Grant County International Airport has nonstandard HIRL. Anacortes and Orcas Island have visual approaches only, while Friday Harbor and Pangborn Memorial have non precision instrument approaches with one mile and 1-1/4 miles visibility approach minimums, respectively.

The three airports in Figure 84 that do not meet the fuel sales criteria have 100LL available for sale, but not Jet A. Friday Harbor's online survey indicates an FBO and minor maintenance at the airport, but no major maintenance, although the Airport Master Record indicates major airframe and powerplant repair service is available.

Figure 84: Commercial Service Airports Not Meeting Criteria

Criteria	Airports Not Meeting Criteria
Passenger Terminal	Anacortes
Runway Length	Anacortes, Friday Harbor, Orcas Island
Taxiway	None
Runway Lighting	Anacortes, Grant County International, Kenmore Air Harbor, Inc., Orcas Island, Pangborn Memorial, Wm. R. Fairchild International
Approach	Anacortes, Friday Harbor, Orcas Island, Pangborn Memorial
Visual Glide Slope Indicator (VGSI)	Kenmore Air Harbor, Inc.
Weather Reporting	Anacortes
Fuel Sales	Friday Harbor, Kenmore Air Harbor, Inc., Orcas Island
Maintenance Service	Friday Harbor

Anacortes and Orcas Island are among the most deficient airports in the draft Commercial Service Airport classification. Based upon draft 2005 passenger enplanement data, these two airports no longer meet the FAA criteria for primary or non-primary Commercial Service Airports.

Commercial Service Airport Key Findings

A majority of airports meet all seven performance objectives identified for this classification. Although a majority of airports have adequate systems, the weakest performance in this classification is in the runway lighting and approach capability. Runway lighting is critical to enhanced safety on the airfield - these criteria should be examined further.

Criteria for Regional Service Airports

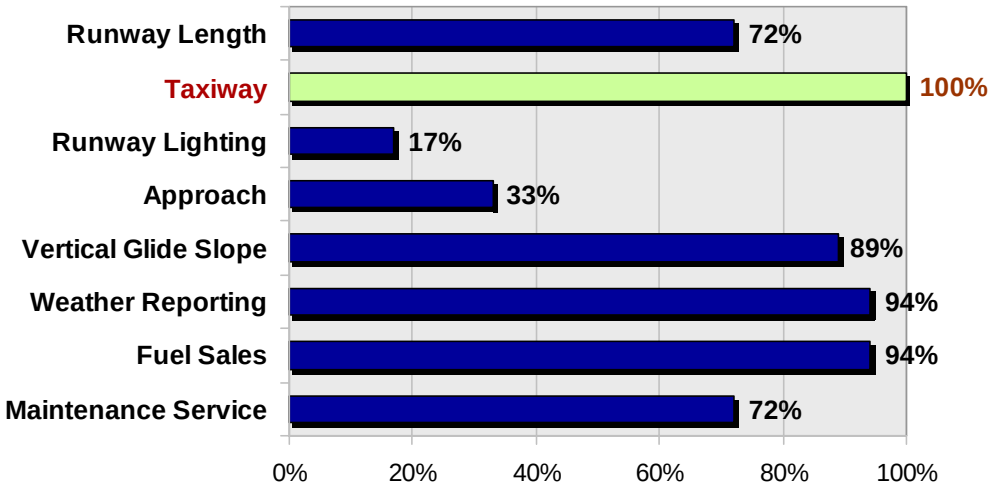
The performance criteria for Regional Service Airports, as well as the criteria for inclusion of airports in the Regional Service classification, are based on the assumption that these airports may someday become Commercial Service Airports. Population growth and other changes in air service market conditions may bring commercial service to them in the future or they may need to replace a Commercial Service Airport in case of a natural disaster.

Figure 85 lists the minimum performance criteria proposed for the 18 Regional Service Airports and the percentages of airports meeting the criteria. The runway length is the minimum recommended by NBAA for medium business jets (40,000 pounds) at standard conditions (sea level and 59 degrees F). Airport conditions may warrant a longer runway or an individual airport may require a longer runway for its critical design aircraft. The approach visibility minimum is slightly higher than the minimum for Commercial Service Airports. Other Regional Service Airport criteria are the same as Commercial Service Airport criteria.

Figure 85: Performance Criteria for Regional Service Airports

Criteria	Explanation	Airports Meeting Criteria
Runway Length	5,000 ft.*	72%
Taxiway	Parallel	100%
Runway Lighting	HIRL	17%
Approach	Precision, or lower than ¾ mile visibility minimum	33%
Vertical Glide Slope Indicator	Yes	89%
Weather Reporting	AWOS or ASOS	94%
Fuel Sales	100LL and Jet A	94%
Maintenance Service	Full Service FBO and Major Maintenance Available	72%

Regional Service Airports Level of Performance by Criteria



**NBAA minimum recommendation for medium business jets (40,000 pounds) at standard conditions (59 degrees F and sea level). Airport conditions may warrant a longer runway or an individual airport may require a longer runway for its critical design aircraft.*

Figure 86 lists the airports that do not meet the proposed criteria for Regional Service Airports. The four airports lacking a runway 5,000 feet long have runways that range between 2,671 feet and 4,654 feet long. All of the airports have primary runways with full-length parallel taxiways or nonparallel taxiway connections to both thresholds, such as at Harvey Field. The greatest deficiencies are for HIRL and precision instrument approaches/visibility minimums lower than ¾ statute mile. All of the airports have runway lighting. Most have MIRL that is sufficient for their instrument approaches. Harvey Field, Kelso-Longview, and Renton Municipal have nonstandard runway lighting.

Of the 12 airports lacking a precision instrument approach, only two lack any sort of instrument approach. High percentages of airport have VGSI, weather reporting, and 100LL/Jet A fuel sales. Auburn Municipal has 100LL but lacks Jet A fuel. The five airports reported as lacking both a full-service FBO and major aircraft maintenance warrant closer examination. All five airports have FBOs reported in the inventory database and on the AirNav Web site; all five are listed as having major airframe and power plant repair in the Airport Master Records, but their inventory databases exclude major aircraft maintenance.

Figure 86: Regional Service Airports Not Meeting Criteria

Criteria	Airports Not Meeting Criteria
Runway Length	Auburn Municipal, Harvey Field, Kelso-Longview, Omak, Richland
Taxiway	None
Runway Lighting	Arlington Municipal, Auburn Municipal, Bowers Field, Columbia Gorge Regional/The Dalles, Deer Park Municipal, Felts Field, Harvey Field, Kelso-Longview, Olympia, Omak, Renton Municipal, Richland, Sanderson Field, Skagit Regional, Tacoma Narrows
Approach	Arlington Municipal, Auburn Municipal, Bowers Field, Columbia Gorge Regional/The Dalles, Deer Park Municipal, Harvey Field, Kelso-Longview, Omak, Renton Municipal, Richland, Sanderson Field, Skagit Regional
Vertical Glide Slope Indicator	Columbia Gorge Regional/The Dalles, Harvey Field
Weather Reporting	Harvey Field
Fuel Sales	Auburn Municipal
Maintenance Service	Auburn Municipal, Bowers Field, Columbia Gorge Regional/The Dalles, Felts Field, Olympia

Regional Service Airport Key Findings

A majority of Regional Service airports meet five of the seven performance objectives identified for this classification: AWOS or ASOS weather reporting, fuel sales, Vertical Guide Slope Indicator, runway length and maintenance service. All but five airports in this classification (72 percent) meet the performance objective for runway length and are adequate to accommodate medium business jets. Airports in this classification had the weakest performance on approach capability (33 percent) and runway lighting (17 percent).

Criteria for Local Community Airports

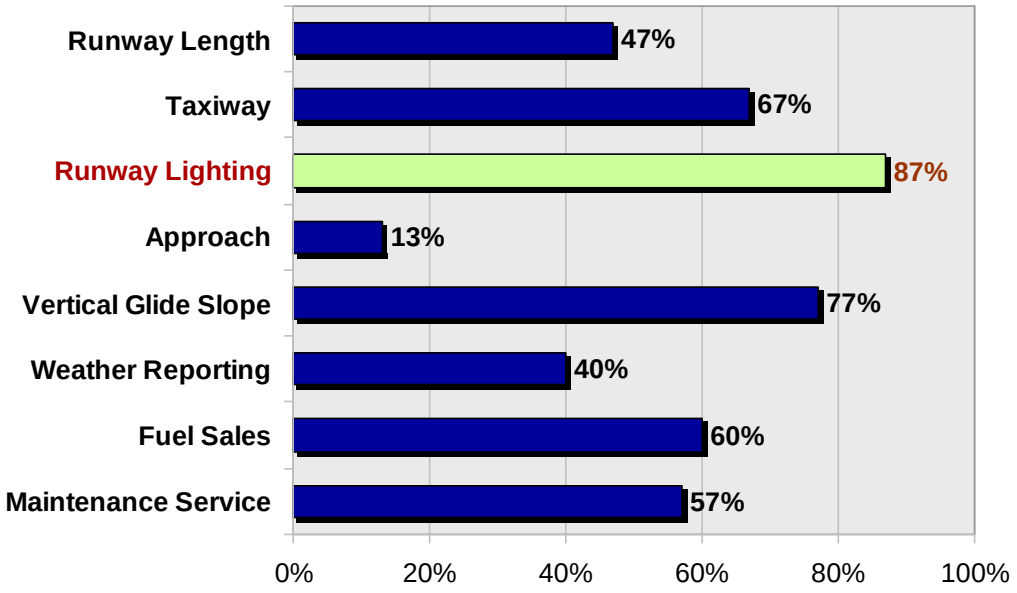
Proposed minimum performance criteria for Local Community Airports are slightly more demanding for airports with 10 or more based aircraft than for airports with fewer than 10 based aircraft. For the airports with at least 10 aircraft, the minimum runway length, need for a parallel taxiway, instrument approach, and weather reporting criteria all relate to facilities required by FAA for instrument approaches.

Figure 86 presents the proposed minimum performance criteria for the Local Community Airports (10 or More Based Aircraft) and the percentages of the 30 airports in this draft classification that meet the criteria. The minimum runway length, 3,200 feet, is the minimum required by FAA for an instrument approach with visibility minimum lower than one statute mile. However, runways as short as 2,400 ft. could support an instrument approach provided the lowest Height Above Threshold (HAT) is based on clearing any 200-foot obstacle approach within the final approach segment. A runway 3,200 feet long would be adequate for between 95 percent and 100 percent of the small airplane fleet with fewer than 10 passenger seats, at sea level and 65 degrees F design temperature. An airport's specific conditions or critical design aircraft may require a longer runway.

Figure 87: Performance Criteria for Local Community Airports (10 or More Based Aircraft)

Criteria	Explanation	Airports Meeting Criteria
Runway Length	3,200 ft.*	47%
Taxiway	Parallel	67%
Runway Lighting	MIRL	87%
Approach	Nonprecision, 1 mile visibility minimum	13%
Vertical Glide Slope Indicator	Yes	77%
Weather Reporting	Superunicom	40%
Fuel Sales	100LL	60%
Maintenance Service	Minor Service	57%

Local Community More than 10 Based Aircraft Airports Level of Performance by Criteria



**According to FAA Advisory Circular 5300-13, Change 9, 3,200 ft. is the minimum required at an airport with instrument approach visibility minimum lower than 1 mile. However, runways as short as 2,400 ft. could support an instrument approach provided the lowest Height Above Threshold (HAT) is based on clearing any 200-foot obstacle approach within the final approach segment. An individual airport may require a longer runway for its specific conditions or critical design aircraft.*

Figure 88 lists the airports that do not meet the proposed criteria for Local Community Airports (10 or More Based Aircraft).

Figure 88: Local Community Airports Not Meeting Criteria (10 or More Based Aircraft)

Criteria	Airports Not Meeting Criteria
Runway Length	Blaine Municipal, Cashmere Dryden, Colville Municipal, Concrete Municipal, Davenport Municipal, Grove Field, Jefferson County International, Lopez Island, Moses Lake Municipal, Odessa Municipal, Okanogan Legion, Rosalia Municipal, Tonasket Municipal, Waterville, Wilbur Municipal, Willard Field
Taxiway	Anderson Field, Chelan Municipal, Concrete Municipal, Davenport Municipal, Goldendale Municipal, Okanogan Legion, Othello Municipal, Toledo-Winlock Ed Carlson Memorial Airport, Waterville, Willard Field
Runway Lighting	Concrete Municipal, Davenport Municipal, Lopez Island, Sunnyside Municipal
Approach	Anderson Field, Blaine Municipal, Cashmere Dryden, Chelan Municipal, Colville Municipal, Concrete Municipal, Davenport Municipal, Dorothy Scott Municipal, Goldendale Municipal, Grove Field, Jefferson County International, Lopez Island, Moses Lake Municipal, Odessa Municipal, Okanogan Legion, Othello Municipal, Prosser, Rosalia Municipal, Sand Canyon, Sunnyside Municipal, Ed Carlson Memorial Airport, Tonasket Municipal, Waterville, Whitman County Memorial, Wilbur Municipal, Willard Field
Vertical Glide Slope Indicator	Concrete Municipal, Davenport Municipal, Odessa Municipal, Okanogan Legion, Whitman County Memorial, Wilbur Municipal, Willard Field
Weather Reporting	Anderson Field, Cashmere Dryden, Colville Municipal, Concrete Municipal, Davenport Municipal, Dorothy Scott Municipal, Goldendale Municipal, Moses Lake Municipal, Odessa Municipal, Okanogan Legion, Othello Municipal, Sand Canyon, Sunnyside Municipal, Ed Carlson Memorial Airport, Tonasket Municipal, Waterville, Whitman County Memorial, Willard Field
Fuel Sales	Anderson Field, Cashmere Dryden, Concrete Municipal, Goldendale Municipal, Grove Field, Lopez Island, Moses Lake Municipal, Odessa Municipal, Pierce County/Thun Field, Sand Canyon, Tonasket Municipal, Whitman County Memorial
Maintenance Service	Blaine Municipal, Davenport Municipal, Goldendale Municipal, Lopez Island, Odessa Municipal, Othello Municipal, Prosser, Rosalia Municipal, Sunnyside Municipal, Tonasket Municipal, Waterville, Whitman County Memorial, Wilbur Municipal

Local Community Airport (10 or More Based Aircraft) Key Findings

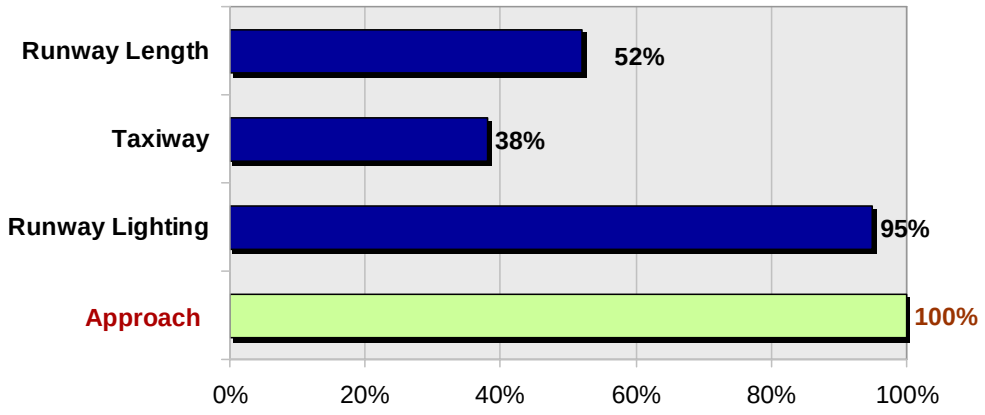
A majority of Local Community airports meet the performance objective for runway lighting, Vertical Glide Slope Indicator, parallel taxiway and fuel sales. Local Community airports had the weakest performance on runway length (4 percent) and superunicom weather reporting (40 percent).

Figure 89 presents the proposed minimum performance criteria for the Local Community Airports (Less Than 10 Based Aircraft) and the percentages of the airports in this draft classification that meet the criteria. The minimum runway length is 2,800 feet, which is nominally the length required for 95 percent of the small aircraft fleet with fewer than ten seats at sea level and 65 degrees design temperature.

Figure 89: Performance Criteria for Local Community Airports (Less than 10 Based Aircraft)

Criteria	Explanation	Airports Meeting Criteria
Runway Length	2,800 ft.*	52%
Taxiway	Turnaround at each end	38%
Runway Lighting	Reflectors	95%
Approach	Visual	100%

Local Community Less than 10 Based Aircraft Airports Level of Performance by Criteria



**2,790 ft. is the length required by FAA software for 95 percent of the small aircraft fleet with fewer than 10 seats at sea level and 85 degrees F.*

Figure 90 lists the airports that do not meet the proposed criteria for Local Community Airports (Less Than 10 Based Aircraft).

Figure 90: Local Community Airports Not Meeting Criteria (Less Than 10 Based Aircraft)

Criteria	Airports Not Meeting Criteria
Runway Length	Cle Elum Municipal, Darrington Municipal, Forks Municipal, Mansfield, Ocean Shores Municipal, Packwood, Port of Ilwaco, Strom Field, Twisp Municipal, Westport
Taxiway	Darrington Municipal, Ferry County, New Warden, Packwood, Port of Ilwaco, Quincy Municipal, Sekiu, Strom Field, Westport, Wilson Creek
Runway Lighting	Wilson Creek
Approach	None

Local Community Airport (Less than 10 Based Aircraft) Key Findings

Performance on the runway lighting objective is high for Local Community Airports (Less than 10 Based Aircraft) – all but one airport have reflectors or a more advanced lighting system. Just over half the airports in this classification meet the performance objective for runway length. Almost 40 percent of Local Community airports meet the safety performance objective for providing a runway turnaround or parallel taxiway.

Criteria for Recreation or Remote Airports

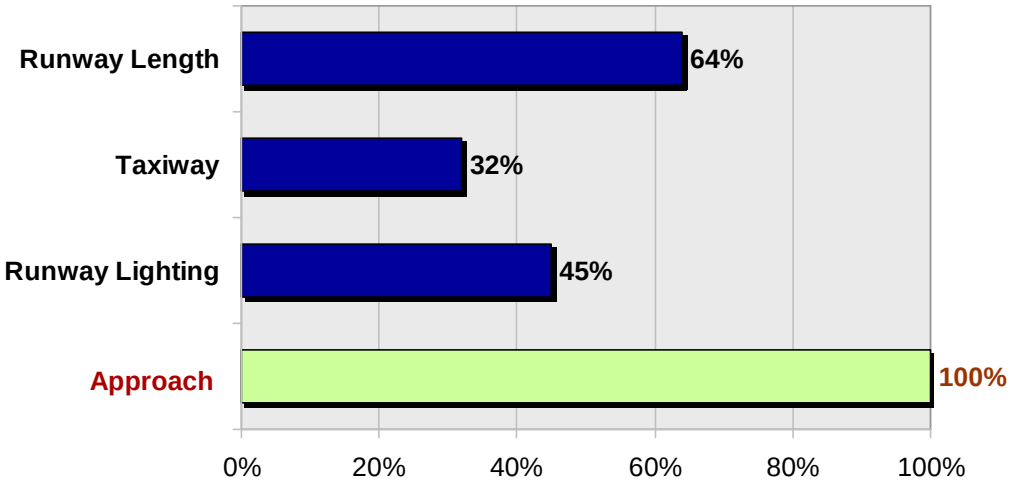
Proposed minimum performance criteria for Recreation or Remote Airports are similar to the criteria for Local Community Airports (Less Than 10 Based Aircraft), except that the minimum runway length is shorter. The length of 2,400 feet is the minimum for an instrument approach according to FAA criteria, provided the HAT is based on clearing any 200-foot obstacle approach within the final approach segment. A runway length of 2,400 feet would be adequate for between 75 percent and 95 percent of the small aircraft fleet with fewer than 10 seats at sea level and 65 degrees F design temperature. Specific airport conditions or critical design aircraft may require a longer runway.

Figure 91 presents the proposed performance criteria for the Recreation or Remote Airports and the percentages of the 47 airports in this draft classification that meet the criteria.

Figure 91: Performance Criteria for Recreation or Remote Airports

Criteria	Explanation	Airports Meeting Criteria
Runway Length	2,400 ft.*	64%
Taxiway	Turnaround at each end	32%
Runway Lighting	Reflectors	45%
Approach	Visual	100%

Recreation or Remote Airports Level of Performance by Criteria



**Min. for instrument approach and adequate for between 75 percent and 95 percent of small aircraft with fewer than 10 seats at sea level and 65 degrees F. Airport conditions or critical design aircraft may require a longer runway.*

Figure 92 lists the airports that do not meet the proposed criteria for Recreation or Remote Airports.

Figure 92: Recreation or Remote Airports Not Meeting Criteria

Criteria	Airports Not Meeting Criteria
Runway Length	Avey Field State, Bandera State, Camano Island Airfield, DeVere Field, Elma Municipal, Evergreen Field, Firstair Field, Hoskins Field, J-Z, Lester State, Rogersburg State, Shady Acres, Sky Harbor, Skykomish State, Sullivan Lake State, Vashon Municipal, Woodland State
Taxiway	Insufficient data to determine
Runway Lighting	Bandera State, Camano Island Airfield, Cedars North Airpark, Copalis State, Cross Winds, Firstair Field, Fly For Fun, Hoskins Field, J-Z, Lake Wenatchee State, Lester State, Little Goose Lock & Dam State, Lost River Airport, Lower Granite State, Mead Report, Point Roberts Airpark, Quillayute, Ranger Creek State, Rogersburg State, Sky Harbor, Skykomish State, Stehekin State, Sullivan Lake State, Tieton State, Whidbey Airpark
Approach	None

Recreation or Remote Airport Key Findings

A majority of airports in this classification – 64 percent – meet the performance objective for runway length. The runway turnarounds and reflectors are safety objectives that are currently met by a minority of airports in the Recreation or Remote classification.

Criteria for Seaplane Bases

Figure 93 presents the proposed minimum performance criteria for Seaplane Bases and the percentages of the nine airports in this draft classification that meet the criteria.

Figure 93: Performance Criteria for Seaplane Bases

Criteria	Explanation	Airports Meeting Criteria
Dock Facility	Yes	89%
Approach	Visual	100%

Seaplane Bases Level of Performance by Criteria

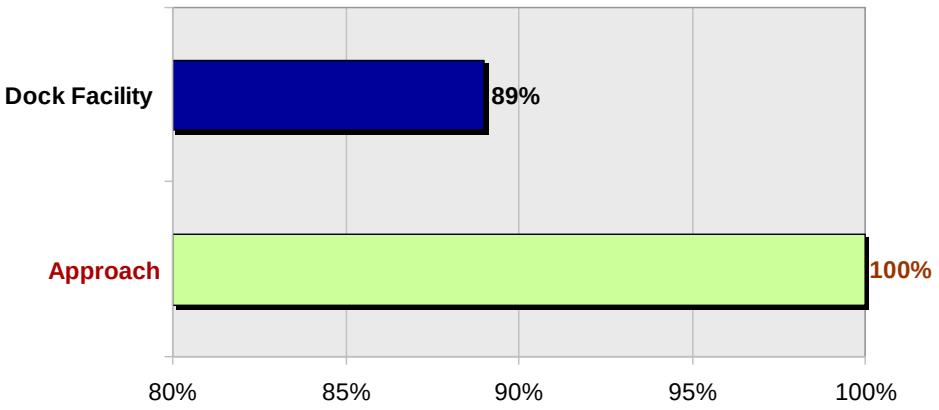


Figure 94 lists the Seaplane Bases that do not meet the proposed criteria. The determination of dock facilities was from information available in the Airport Facility Directory, Washington State Pilots Guide, and AirNav.com. Seaplane Bases charging landing fees, selling fuel, providing maintenance, and having adjacent boat docks were assumed to have dock facilities for airplanes.

Figure 94: Seaplane Bases Not Meeting Criteria

Criteria	Airports Not Meeting Criteria
Dock Facility	Skyline SPB
Approach	None

Seaplane Base Key Findings

Seaplane bases in Washington's aviation system have adequate approach capabilities to meet the needs of users. Almost all seaplane bases have dock facilities that support operations. Only one seaplane base requires a dock.

PART 6: WHAT DID WE LEARN?

Is the state meeting current demand and performance objectives? This section summarizes some of the key findings from the Phase I assessment to help answer those crucial questions. This section also identifies key areas of further evaluation for the remaining two phases. As the first comprehensive airport system study in over 20 years, it is important the capacity issues and market demand are thoroughly evaluated at all levels from the individual airport level up to the statewide perspective. Since Washington's population and aviation activity are concentrated in four key regions, it is important to identify the potential capacity issues that may have differing impacts throughout the state. The clearer the understanding of these issues, the more effective policy makers can be in targeting airport development and investment for the future.

The capacity findings from Phase I are summarized below and will serve as the foundation for the Phase II efforts, which will include demand forecasts and future capacity. The findings are grouped by the industry capacity measures outlined in Part 3.

Passenger capacity adequate at Special Emphasis Region Airports with exception of Sea-Tac and Boeing Field, with Bellingham showing signs of capacity constraint

Based on the peak hour passenger demand and terminal capacities analyzed above, the Seattle-Tacoma International Airport and the Tri-Cities Airport, both at 68 percent capacity, exceed the 60 percent threshold identified by FAA to initiate planning for new facilities. In fact, the two airports have nearly reached the 70 percent capacity level where FAA recommends additional capacity should be in place. Bellingham's market dynamics have changed considerably as new larger jet service has increased between 2005 and 2006 (130-150 seat MD80s), causing peak-hour capacity constraint issues.

All other airports evaluated under the Special Emphasis Regions have ample reserve peak hour passenger capacity.

Discussion:

The airports continue to operate efficiently today, but exceed 60 percent utilization threshold set by the FAA as the point at which airports should begin planning for expansion. Sea-Tac will open a third runway that is fully operation in 2009 and has been planning for this infrastructure since

the early 1990's. However, even with this new runway capacity, Sea-Tac airport planners estimate air side capacity will reach its peak at approximately 2021 to 2023. These demand and capacity estimates assume no unforeseen industry shocks like the events of September 11th. There are no plans for any further airside expansion at Sea-Tac.

Tri-Cities has performed an aircraft parking study evaluating further ramp and aircraft parking positions on the airside and they are watching airside capacity issues closely as service and passenger demand continues to grow.

Currently, Bellingham is developing plans to evaluate terminal expansion alternatives to meet the needs of the new service growth.

Phase II will include a market demand analysis that will closely examine the need for passenger service in Washington. There appears to be adequate reserve capacity in the state aviation system to accommodate passenger services, but will it be enough to serve the demand anticipated in the next 20 years? More importantly, will regional capacity adequately serve focused market demand concentrated in select areas across the state?

Ample cargo capacity exists statewide with the exception of Boeing Field and Sea-Tac

The analysis of cargo facilities presented above concluded that, with the exception of Boeing-Field/King County International Airport and Seattle-Tacoma International Airport, there is ample cargo capacity at the remaining airports throughout Washington State. Boeing Field and Sea-Tac Airports are at approximately 80 percent and 60 percent of their respective capacities. Given the distribution of population within the Puget Sound Region and economic influences driving forces driving cargo activity at these two airports, it may be difficult to relocate future cargo activity to other airports in Washington State with available capacity. The cargo demand forecasts prepared under Phase II of this analysis will identify future anticipated cargo demand throughout the state system.

Many areas of the state are approaching capacity for aircraft storage

The aircraft storage and parking for the total of all Washington airports has reached 85 percent of its existing capacity. Several of the airports throughout Washington State have reached or exceeded the existing aircraft storage capacity, including: Harvey Field, Renton Municipal, Sea-Tac International, Spokane International, Cross Winds, Fly for Fun, Ceders North Airpark. While many of the airports still have existing excess aircraft storage capacity, the majority of available storage is with

aircraft tie-downs rather than hangars. The actual demand for hangars is far greater than demand for tie-downs as most aircraft owners prefer secure, weather-proof storage facilities. This demand has resulted in the creation of wait lists by airports to track the individuals who desire hangar rentals at their airport. The survey information illustrates a total of 651 individuals are currently on hangar wait lists throughout the state.

Discussion:

Aircraft storage facilities are vitally important for supporting general aviation activity in Washington. Hangars and tiedowns provide access to the air transportation system for local pilots, and facilitate transient aircraft visiting the community or utilizing aviation-related services at the airport. The limited amount of reserve capacity in certain areas of the state degrades access to the air transportation, even in the short term.

The demand forecasts conducted in Phase II will identify future demand for based aircraft storage at the state's airports and compare future needs to existing capacity. It is likely that existing facilities may not be adequate to accommodate future needs.

Six airports appear to be at or nearing operations capacity

The three Commercial Service airports, Boeing Field, Kenmore Air Harbor and Sea-Tac are the most severely impacted airports relative to reserve operations capacity, with Boeing Field the most impacted Commercial Service airport in the state. Of the remaining land-based airports, the Regional Service facilities of Auburn Municipal and Harvey currently exceed the FAA's 60 percent planning threshold while Ephrata Municipal, a Local Community facility, is approaching 60 percent capacity. However, the majority of Ephrata's operations are glider aircraft, serving a large recreation role for the state system. The Kenmore Air Harbor/Lake Union Seaplane Base is well over capacity – particularly significant given the busy marine environment within which it operates.

It should be emphasized that the reserve operations capacities identified below, and throughout the analyses presented above, are existing capacities based on 2005 data. Subsequent analyses under Phase II of this study will generate forecasts of future demand for airports throughout Washington State. Once the forecasts are completed, the available reserve capacity of each individual airport, as well as the state system as a whole, will need to be revisited to assess the implications of long-term trends in aviation demand versus capacity of the system.

Discussion:

The airports identified are currently utilizing 60 percent or more of existing capacity. Five of the six airports are located in the Puget Sound Region. Ephrata, located in Grant County, is largely a recreation facility serving glider activity. Ephrata's ability to serve this type of activity allows other existing facilities to accommodate different user types. Thus Ephrata plays an important role in the overall system and its capacity to accommodate future recreational growth is important to monitor.

This capacity analysis is based on existing conditions. Phase II will include demand forecasts to identify future demand for air transportation in Washington. Future demand will be compared to existing capacity to determine future needs for improvement and/or expansion.

Airports statewide are demonstrating moderate performance on minimum criteria

While many airports are at various stages of compliance with state planning law, a majority of airports systemwide do not meet all criteria for compatible land use and zoning. There is high compliance on wind cone and rotating beacon visual navigation aids, but significantly fewer airports have a segmented circle.

Discussion:

Minimum criteria were set to ensure a basic level of operational safety and preservation at the state's public-use airports.

Commercial Service and Regional Service airports providing high level of service and safe travel for general aviation

All Commercial Service and a majority of Regional Service airports meet the performance objectives for parallel taxiways. A majority of Commercial Service and Regional Service airports meet the performance objectives for runway length. A majority of Commercial Service airports meet the performance objective for runway lighting. Only 17 percent of Regional Service airports have the HIRL identified in the performance objective, although a majority of the deficient airports do have MIRL.

A majority of Commercial Service airports meet the performance objective and have a precision or ½ mile visibility minimum. A minority of Regional Service airports meet this performance objective.

All airports in the Commercial Service classification and a majority of airports in the Regional Service classification provide real-time weather reporting. Maintenance service and fuel sales are widely available at Commercial Service and Regional Service airports.

Discussion:

Safety: While compliance on parallel taxiways and weather reporting is high, the two objectives shown with significantly lower performance – approach capability and runway lighting – are safety features that are critically important for high service level airports.

Service Level: Both classifications are performing well in terms of providing appropriate services for airport users. It is significant that although general aviation operations are higher at Commercial Service airports, Regional Service airports provide the greatest level of support services for general aviation pilots.

Local Community airports with ten or more based aircraft have high compliance on five of seven performance objectives

A majority of airports in this classification meet the objectives for runway lighting, Visual Guide Slope Indicator, parallel taxiways and fuel sales. More than half the Local Community airports with ten or more based aircraft meet the performance objective for the availability of minor maintenance service. Airports in this classification had the weakest performance on runway length and superunicom weather reporting.

Discussion:

Safety: Compliance on parallel taxiways is high for this category, enhancing safety by separating aircraft to avoid collisions and near-misses, also referred to as *runway incursions.* Performance among airports in this classification on runway lighting was also high. Performance on approach capability and weather reporting was relatively low, however, limiting 24-hour and all weather access to Local Community airports.

Service Level: Compliance was high on most service level objectives. Only 47 percent of airports met the runway length performance objective, however; suggesting limited access for larger aircraft at these airports.

While the airports have adequate approaches and many meet the performance objective for runway length, a minority of Recreation or Remote and Local Community airports with fewer than ten based aircraft meet the performance objective for runway turnarounds

Improvements to approaches are not needed for airports in these classifications. Performance on the runway lighting objective is high in the Local Community classification – all but one airport have reflectors or a more advanced lighting system. Conversely, performance among the Recreation or Remote airports is low. Community classification – all but one airport have reflectors or a more advanced lighting system. Conversely, performance among the Recreation or Remote airports is low. Just over half the airports in the Local Community classification meet the performance objective for runway length, while 64 percent of Recreation or Remote airports meet the objective.
A minority of airports in these classifications meet the safety performance objective for providing a runway turnaround or parallel taxiway.

Discussion:

Safety: Compliance on runway turnarounds, which provide the aircraft separation that is preferred for safe operations. Recreation and Remote airports also show low compliance with the runway lighting performance objective.

Service Level: Airports in these classifications generally meet service level objectives. Approach capability beyond visual is not identified, and a majority of the airports meet the performance objective for runway length.

Seaplane bases provide adequate service levels

Improvements to approaches are not necessary for this classification. All but one of the seaplane bases in the state aviation system provides dock facilities.

Discussion:

Based on existing criteria, seaplane bases in Washington are providing aviation users with adequate approaches and dock facilities for aircraft storage.

PART 7: WHAT'S NEXT?

Phase II:

Phase II is scheduled for completion by July 2007. The Phase II analysis will include a statewide needs analysis of airport facilities, passenger and air cargo transportation capacity, and demand and forecast market needs over the next twenty-five years with a more detailed analysis of the Puget Sound, southwest Washington, Spokane, and Tri-Cities regions. While the analysis will address the forecasted needs of both commercial aviation and general aviation; the primary focus of the analysis must be on commercial aviation.

Airport Activity Forecasting and Market Analysis

Once complete, LATS will serve as the strategic plan for Washington's air transportation system, ensuring that the state has a safe and reliable network of airports to efficiently serve the needs of both residents and visitors. One of the most important steps in creating this strategic plan is the development of reasonable estimates of future demand. For general aviation airports, forecasts of based aircraft and aircraft operations will largely determine future facility requirements at system airports and help WSDOT and the FAA assess the relative costs and benefits of potential improvements and investments.

Market analysis of Washington's commercial airports will be conducted at the airports served by commercial airlines. If other airports exist with a consistent level of air service within the last decade, but currently lack commercial airlines, we will evaluate their market potential.

High-Speed Passenger Transportation Facilities and Services

The purpose of this task is to identify and evaluate potential opportunities for implementing high-speed passenger services between airports, cities, and activity centers in and around Washington State. High-speed transportation systems, such as maglev and high speed rail services, offer the potential to:

- Enhance the mobility of Washington residents and visitors traveling between the state's cities and other nearby cities and activity centers in Washington, Oregon and British Columbia; and

- Alleviate airport congestion levels by providing viable non-air traveling options for shorter intercity trips.

Phase III:

Near the end of Phase II the Governor will evaluate candidates that WSDOT's office will provide as potential members. The 10 members will include:

- WSDOT Aviation Director
- Director of Washington State Community, Trade and Economic Development (CTED)
- Member of Transportation Commission
- Two members of general public
- FAA technical expert
- Commercial airport operator
- Member of Growth Management Act (GMA) hearings board
- Washington Airport Managers Association representative
- Airline representative

The governor will appoint members to the Aviation Planning Council that will provide recommendations on how to best meet the statewide commercial and general aviation air transportation needs in the state. The Governor's Airport Planning Council will base its recommendations on the assessment and analysis completed in LATS Phases I and II, as well as public input.

The Governor's Airport Planning Council will identify priority areas for aviation development and investment in Washington State with regard to existing or long-range airport needs. The Governor's Airport Planning Council is also expected to make recommendations regarding the potential placement of future/expanded commercial and general aviation airport facilities.

The Governor's Airport Planning Council will evaluate the findings and submit its recommendations to the governor, appropriate standing committees of the legislature, the transportation commission, and applicable regional transportation planning organizations. The legislative deadline for completion of Phase III is July 2009.

APPENDIX A: DETAILED TABLE OF THE WASHINGTON STATE AIRPORTS

The detailed table of the Washington State Airports is shown on the following pages.

Site	Name	City	NPIAS Service Level	Service Level State
26433.C	American Lake SPB	Tacoma	None	Seaplane Base
26098.1A	Anacortes	Anacortes	CM-Commercial Service – NonPrimary	Commercial Service
26123.1A	Anderson Field	Brewster	GA General Aviation Airport	Community Local >10
26099.A	Arlington Municipal	Arlington	GA General Aviation Airport	Regional Service
26103.11A	Auburn Municipal	Auburn	RL Reliever Airport	Regional Service
26267.4A	Avey Field State	Laurier	None	Recreation or Remote
26104.A	Bandera State	Bandera	None	Recreation or Remote
26109.A	Bellingham International	Bellingham	PR Commercial Service - Primary	Commercial Service
26116.A	Blaine Municipal	Blaine	GA General Aviation Airport	Community Local >10
26396.A	Boeing Field/King County Internationa	Seattle	PR Commercial Service - Primary	Commercial Service
26236.A	Bowerman Field	Hoquiam	GA General Aviation Airport	Regional Service
26195.A	Bowers Field	Ellensburg	GA General Aviation Airport	Regional Service
26120.*A	Bremerton National	Bremerton	GA General Aviation Airport	Regional Service
26424.3*A	Camano Island Airfield	Stanwood	None	Recreation or Remote
26135.A	Cashmere Dryden	Cashmere	GA General Aviation Airport	Community Local >10
26104.11*A	Cedars North Airpark	Battle Ground	None	Recreation or Remote
26144.A	Chehalis Centralia	Chehalis	GA General Aviation Airport	Community Local >10
26147.A	Chelan Municipal	Chelan	GA General Aviation Airport	Community Local >10
26159.A	Cle Elum Municipal	Cle Elum	GA General Aviation Airport	Community Local <10
19614.*A	Columbia Gorge Regional/The Dalles	The Dalles	None	Regional Service
26165.A	Colville Municipal	Colville	GA General Aviation Airport	Community Local >10
26167.A	Concrete Municipal	Concrete	None	Community Local >10
26170.A	Copalis State	Copalis	None	Recreation or Remote
26252.1A	Crest Airpark	Kent	None	Recreation or Remote
26157.*A	Cross Winds	Clayton	None	Recreation or Remote
26180.A	Darrington Municipal	Darrington	None	Community Local <10
26181.A	Davenport Municipal	Davenport	GA General Aviation Airport	Community Local >10
26184.A	Deer Park Municipal	Deer Park	GA General Aviation Airport	Regional Service
26290.9A	Desert Aire	Mattawa	None	Recreation or Remote
26159.1A	DeVere Field	Cle Elum	None	Recreation or Remote
26333.A	Dorothy Scott Municipal	Oroville	GA General Aviation Airport	Community Local >10
26189.A	Easton State	Easton	None	Recreation or Remote
26196.A	Elma Municipal	Elma	None	Recreation or Remote

Site	Name	City	NPIAS Service Level	Service Level State
26204.A	Ephrata Municipal	Ephrata	GA General Aviation Airport	Community Local >10
26441.1A	Evergreen Field	Vancouver	None	Recreation or Remote
26417.A	Felts Field	Spokane	RL Reliever Airport	Regional Service
26384.12A	Ferry County	Republic	None	Community Local <10
26304.21A	Firstair Field	Monroe	None	Recreation or Remote
26110.11C	Floathaven SPB	Bellingham	None	Seaplane Base
26444.4A	Fly For Fun	Vancouver	None	Recreation or Remote
26213.A	Forks Municipal	Forks	None	Community Local <10
26219.4A	Friday Harbor	Friday Harbor	GA General Aviation Airport	Commercial Service
26219.1C	Friday Harbor SPB	Friday Harbor	None	Seaplane Base
26104.1A	Goheen Field	Battle Ground	None	Recreation or Remote
26222.1A	Goldendale Municipal	Goldendale	None	Community Local >10
26193.1A	Grand Coulee Dam	Electric City	GA General Aviation Airport	Community Local <10
26307.A	Grant County International	Moses Lake	CM Commercial Service - Non Primary	Commercial Service
26130.A	Grove Field	Camas	GA General Aviation Airport	Community Local >10
26411.A	Harvey Field	Snohomish	RL Reliever Airport	Regional Service
26222.*A	Hillcrest	Goldendale	None	Recreation or Remote
26328.1*A	Hoskins Field	Olympia	None	Recreation or Remote
26240.5A	Ione Municipal	Ione	GA General Aviation Airport	Recreation or Remote
26096.*A	J-Z	Almira	None	Recreation or Remote
26363.A	Jefferson County International	Port Townsend	GA General Aviation Airport	Community Local >10
26246.A	Kelso-Longview	Kelso	GA General Aviation Airport	Regional Service
26395.5*C	Kenmore Air Harbor SPB	Kenmore	None	Seaplane Base
26248.C	Kenmore Air Harbor, Inc.	Seattle	GA General Aviation Airport	Commercial Service
26269.1A	Lake Wenatchee State	Leavenworth	None	Recreation or Remote
26271.*U	Lester State	Lester	None	Recreation or Remote
26273.A	Lind Municipal	Lind	None	Community Local <10
26424.5A	Little Goose Lock & Dam State	Starbuck	None	Recreation or Remote
26274.7A	Lopez Island	Lopez	GA General Aviation Airport	Community Local >10
26291.6*A	Lost River Airport	Mazama	None	Recreation or Remote
26162.1A	Lower Granite State	Colfax	None	Recreation or Remote
26243.5A	Lower Monumental State	Kahlotus	None	Recreation or Remote
26275.A	Lynden Municipal	Lynden	None	Recreation or Remote
26282.A	Mansfield	Mansfield	None	Community Local <10

Site	Name	City	NPIAS Service Level	Service Level State
26163.A	Martin Field	College Place	None	Recreation or Remote
26293.A	Mead Airport	Mead	None	Recreation or Remote
26477.A	Methow Valley	Winthrop	GA General Aviation Airport	Recreation or Remote
26305.A	Moses Lake Municipal	Moses Lake	None	Community Local >10
26454.A	New Warden	Warden	None	Community Local <10
26323.21A	Ocean Shores Municipal	Ocean Shores	GA General Aviation Airport	Community Local <10
26323.4A	Odessa Municipal	Odessa	GA General Aviation Airport	Community Local >10
26324.A	Okanogan Legion	Okanogan	None	Community Local >10
26327.A	Olympia	Olympia	GA General Aviation Airport	Regional Service
26330.A	Omak	Omak	GA General Aviation Airport	Regional Service
26190.*A	Orcas Island	Eastsound	PR Commercial Service - Primary	Commercial Service
26336.2A	Othello Municipal	Othello	GA General Aviation Airport	Community Local >10
26341.A	Packwood	Packwood	GA General Aviation Airport	Community Local <10
26461.A	Pangborn Memorial	Wenatchee	PR Commercial Service - Primary	Commercial Service
26444.A	Pearson Field	Vancouver	GA General Aviation Airport	Community Local >10
26374.1A	Pierce County/Thun Field	Puyallup	GA General Aviation Airport	Community Local >10
26354.*A	Point Roberts Airpark	Point Roberts	None	Recreation or Remote
26240.A	Port of Ilwaco	Ilwaco	None	Community Local <10
26365.C	Poulsbo SPB	Poulsbo	None	Seaplane Base
26369.A	Prosser	Prosser	GA General Aviation Airport	Community Local >10
26388.A	Pru Field	Ritzville	GA General Aviation Airport	Community Local <10
26372.A	Pullman/Moscow Regional	Pullman / Moscow, I	PR Commercial Service - Primary	Commercial Service
26376.5A	Quillayute	Quillayute	GA General Aviation Airport	Recreation or Remote
26376.83A	Quincy Municipal	Quincy	None	Community Local <10
26388.8*A	R & K Skyranch	Rochester	None	Recreation or Remote
26230.A	Ranger Creek State	Greenwater	None	Recreation or Remote
26381.A	Renton Municipal	Renton	RL Reliever Airport	Regional Service
26386.1A	Richland	Richland	GA General Aviation Airport	Regional Service
26388.63C	Roche Harbor SPB	Roche Harbor	None	Seaplane Base
26098.6*A	Rogersburg State	Anatone	None	Recreation or Remote
26389.1A	Rosalia Municipal	Rosalia	GA General Aviation Airport	Community Local >10
26389.4C	Rosario SPB	Rosario	None	Seaplane Base
26150.A	Sand Canyon	Chewelah	None	Community Local >10
26405.A	Sanderson Field	Shelton	GA General Aviation Airport	Regional Service

Site	Name	City	NPIAS Service Level	Service Level State
26395.A	Sea-Tac International	Seattle	PR Commercial Service - Primary	Commercial Service
26401.*A	Sekiu	Sekiu	None	Community Local <10
26402.1A	Sequim Valley	Sequim	None	Recreation or Remote
26414.1*A	Shady Acres	Spanaway	None	Recreation or Remote
26125.1A	Skagit Regional	Burlington/Mount Ve	GA General Aviation Airport	Regional Service
26425.8*A	Sky Harbor	Sultan	None	Recreation or Remote
26409.A	Skykomish State	Skykomish	None	Recreation or Remote
26098.23C	Skyline SPB	Anacortes	None	Seaplane Base
26210.A	Snohomish County/Paine Field	Everett	RL Reliever Airport	Regional Service
26415.A	Spanaway	Spanaway	None	Recreation or Remote
26416.A	Spokane International	Spokane	PR Commercial Service - Primary	Commercial Service
26425.A	Stehekin State	Stehekin	None	Recreation or Remote
26304.8A	Strom Field	Morton	None	Community Local <10
26300.A	Sullivan Lake State	Metaline Falls	None	Recreation or Remote
26428.A	Sunnyside Municipal	Sunnyside	GA General Aviation Airport	Community Local >10
26191.1A	Swanson Field	Eatonville	None	Recreation or Remote
26434.4A	Tacoma Narrows	Tacoma	GA General Aviation Airport	Regional Service
26386.6A	Tieton State	Rimrock	None	Recreation or Remote
26437.A	Ed Carlson Memorial Airport	Toledo	GA General Aviation Airport	Community Local >10
26438.A	Tonasket Municipal	Tonasket	GA General Aviation Airport	Community Local >10
26345.A	Tri-Cities	Pasco	PR Commercial Service - Primary	Commercial Service
26440.A	Twisp Municipal	Twisp	None	Community Local <10
26448.A	Vashon Municipal	Vashon	GA General Aviation Airport	Recreation or Remote
26249.A	Vista Field	Kennewick	None	Community Local <10
26450.A	Walla Walla Regional	Walla Walla	PR Commercial Service - Primary	Commercial Service
26457.A	Waterville	Waterville	None	Community Local >10
26322.11A	Wes Lupien	Oak Harbor	GA General Aviation Airport	Community Local <10
26485.01A	Western Airpark	Yelm	None	Recreation or Remote
26463.A	Westport	Westport	GA General Aviation Airport	Community Local <10
26266.2A	Whidbey Airpark	Langley	GA General Aviation Airport	Recreation or Remote
26162.A	Whitman County Memorial	Colfax	GA General Aviation Airport	Community Local >10
26471.A	Wilbur Municipal	Wilbur	GA General Aviation Airport	Community Local >10
26381.01C	Will Rogers Wiley Post SPB	Renton	None	Seaplane Base
26412.A	Willapa Harbor	South Bend (Raymo	None	Community Local <10

Site	Name	City	NPIAS Service Level	Service Level State
26436.A	Willard Field	Tekoa	GA General Aviation Airport	Community Local >10
26471.5*A	Wilson Creek	Wilson Creek	None	Community Local <10
26357.A	Wm. R. Fairchild International	Port Angeles	PR Commercial Service - Primary	Commercial Service
26478.1A	Woodland State	Woodland	None	Recreation or Remote
26480.A	Yakima Air Terminal	Yakima	PR Commercial Service - Primary	Commercial Service

APPENDIX B: TECHNICAL MEMOS

Technical Memo 1: Data Collection

WSDOT Aviation maintains a database of information on the 140 public use airports. This information for the database was first collected in 1997 and then updated in 2003. To adequately locate and document all the data currently included in Washington State's database, an exhaustive effort was made to collect this information. This included an airport data search, airport site visits, airport management interviews, physical facility inventories, evaluation of existing operational activity, WSDOT/FAA design standard compliance, runway safety area inspections, estimates of future operational activities, multi-modal connection information, identification of approach surface obstructions, preparation of development needs lists, pavement condition surveys and preparation of an airport data condition assessment compendium.

As part of the long range system plan (LATS) efforts, updated information was required for the public use airports. In addition, there was new material previously uncollected required to complete the analysis efforts for the system capacities and future growth potential. In an effort to obtain the new and updated material several data collection methods were considered, including desktop airport reviews, physical site visits, and online surveys.

An online, web-based survey was developed to effectively collect the new and updated airport inventory information state-wide. Prior to developing a web-based survey, the existing data needed to be reviewed to determine both the level of detail of the existing information and the information that was available. The LATS team developed a significant number of new items that were not in the existing database that would provide beneficial information for LATS and WSDOT Aviation uses. The information was then grouped into similar categories and definitions were created to develop a database dictionary that would be used as help functions for the survey.

A Web site was constructed that would allow individual airport sponsors access to their own secure Web site to review questions regarding their airport. The Web site was constructed as a series of 16 individual update pages that allowed the airport managers to access the Web site and either complete the survey at one

time, or over a series of several days. Once the information was updated to the satisfaction of the airport sponsor, they could save the information "as complete".

Upon completion of the surveys by each airport sponsor, the consultant team reviewed the surveys and provided follow-up phone calls to individual sponsors to resolve any items of concern. There were several airport sponsors that did not have the capability to access the web-based survey, and for these airports, a paper copy of the survey was distributed to each of those sponsors. Upon receipt of the completed paper copy of the survey, the consultant team entered the information into the database.

The initial electronic surveys were emailed out on June 12th, with the request to have the survey's completed by June 30th. Follow-up emails and phone calls were made beginning the week of June 19th and continued through July. The goal of WSDOT Aviation was to receive 100 percent survey participation and completion of this update. By mid July, over 60 percent of the surveys had been completed by the various airport sponsors. The consultant team provided updated information to the database for the airports who had not responded to the survey based on master plans, airport layout plans, other planning documentation, aviation Web sites, and FAA sources to provide the most updated information possible to complete the analysis.

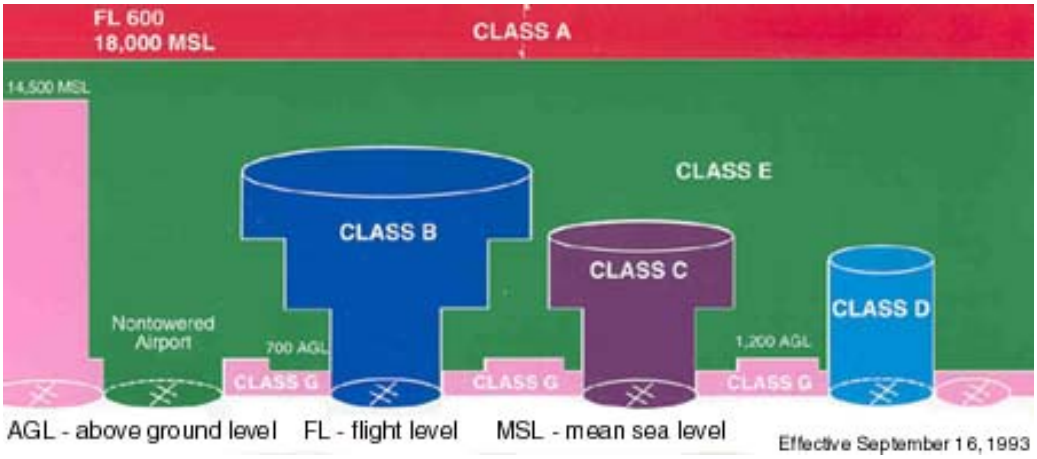
Technical Memo 2: Airspace System Analysis

Unlike the other criteria being assessed, measuring airspace capacity cannot be done using mathematical calculations or FAA manuals. Also, no in-depth studies of the airspace have been conducted in recent years. Therefore, this report will examine the airspace structure of the state overall and examine the interaction of the airport's within that space for the Engrossed Substitute Senate Bill (ESSB) 5121, Special Emphasis Regions, where the number of airports sharing airspace makes for complicated interactions.

The Federal Aviation Administration (FAA) has developed a system for defining the airspace of the United States that accounts for both the space that individual airports require for safe operations as well as accounting for requirement to separate aircraft in transit between airports. The following summary explains this structure in general and how it relates to Washington State airspace in particular, Exhibit X.X depicts the airspace of Washington State.

There are two basic categories of airspace, Regulatory and Non-regulatory. Regulatory Airspace is defined as the "Class A, B, C, D, and E Airspace Areas," Restricted Areas and Prohibited Areas. There is also a "Class G" airspace that the FAA defines as not being A, B, C, D, or E. Each of these are depicted on the attached graphic and described in the following.

FAA Airspace Classes – Industry Categories by Altitude



Source: Safety Advisor: Regulations No. 1, Aircraft Owner and Pilots Association, 2006.

Regulatory Airspace

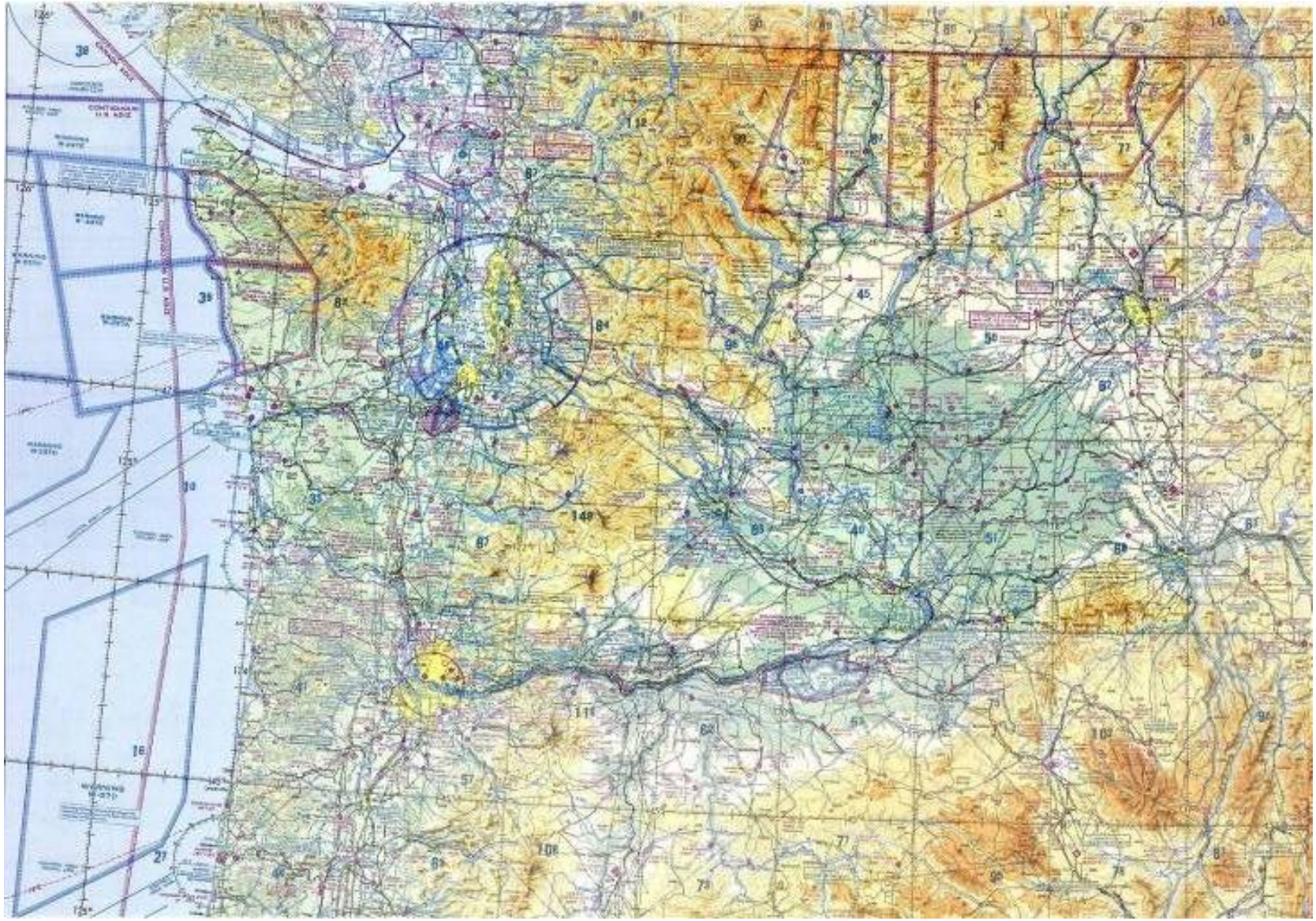
Class "A" Airspace

Class "A" airspace is all of the airspace from 18,000 feet Mean Sea Level (MSL) up to Flight Level (FL) 600 (60,000 feet MSL). Class A airspace covers all of Washington State and is the airspace where commercial flight operations occur.

Class "B" Airspace

Class B airspace extends from the surface of the ground to 10,000 feet MSL. Class B surrounds the country's busiest airports. The configuration is often referred to as resembling an "upside down wedding cake." Within Class B airspace all pilots must operate in compliance with the following rules;

Statewide Airspace

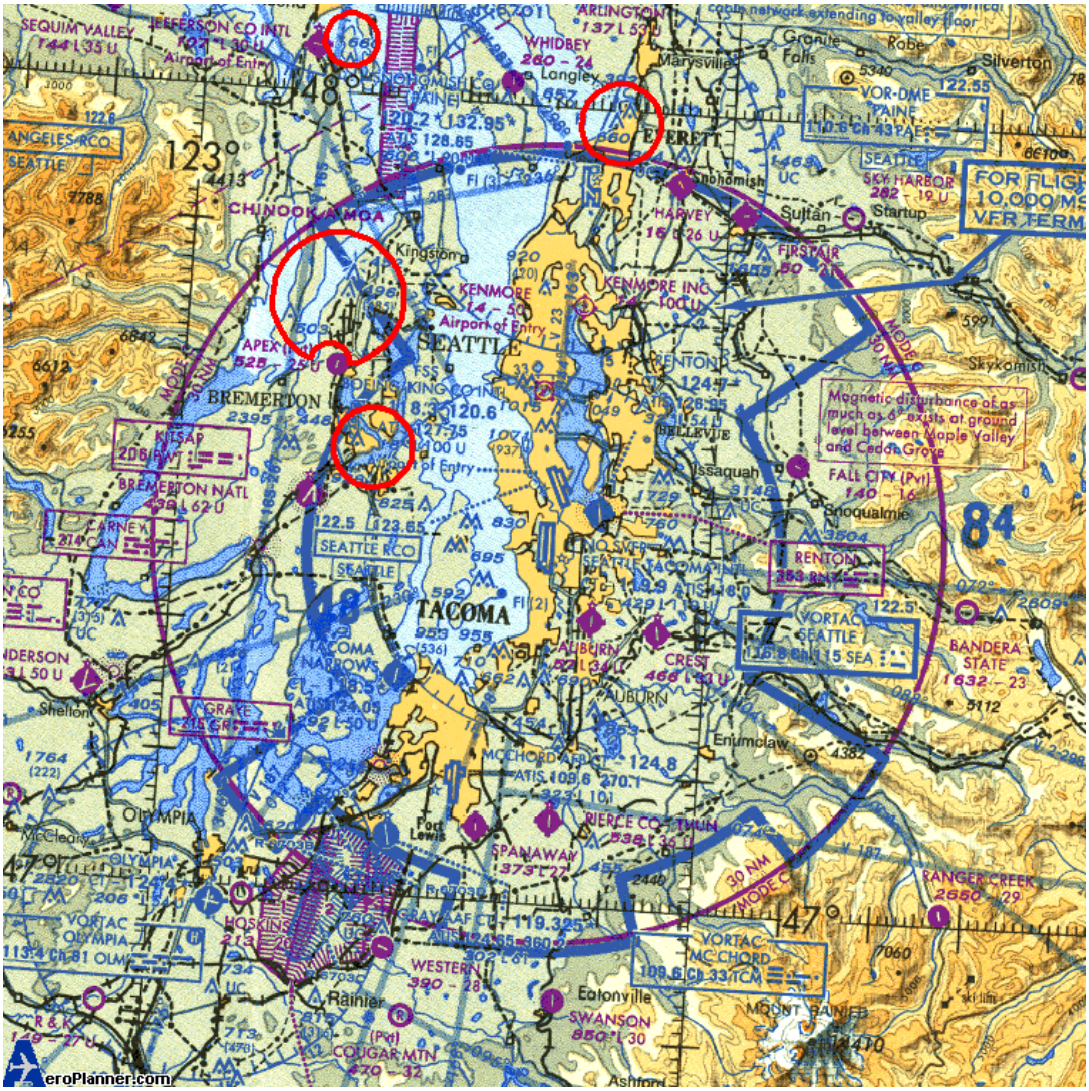


1. The pilot must receive an Air Traffic Control (ATC) clearance from the ATC facility having jurisdiction for the area before operating an aircraft within that area.
2. Unless otherwise authorized by ATC, each person operating a large turbine engine-powered airplane to or from a primary airport for which a Class B airspace area is designated must operate at or above the designated floors of the Class B airspace area while within the lateral limits of that area.
3. Any person conducting pilot training operations at an airport within a Class B airspace area must comply with any procedures established by ATC for such operations in that area.

The only Class B airspace in Washington State is that associated with the Sea-TacAirport (SEA) and depicted in the attached exhibit (Exhibit 20). All aircraft operating within this airspace, whether VFR or IFR, must obtain clearance from Seattle ATC. Additionally, all aircraft operating within Class B airspace must maintain radio contact with the ATC and be equipped with transponders. As exhibit X.X shows, of airports in this study, the following is a list of those within or beneath SEA's Class B Airspace include;

1. Snohomish County International Airport (Paine Field)
2. King County International Airport/Boeing Field
3. Harvey Field
4. Firstair
5. Kenmore SPB
6. Renton Municipal/Clayton Scott Field
7. Wiley Post SPB
8. Crest Airpark
9. Auburn Municipal Airport
10. Pierce County/Thun Field
11. Spanaway
12. Tacoma Narrows Airport

Seattle-Tacoma International Airport Class B Airspace.



Class "C" Airspace

This is the airspace reserved for most commercial airports. It can be altered for regional conditions, but is generally a circle around the airport that is five miles in diameter from the surface to 1,200 feet AGL (Above Ground Level), and then expands to a 10 mile diameter from that point to 4,000 feet AGL.

Aircraft can operate VFR in this airspace but must first establish two-way radio communications before entry. They must have three miles of visibility, and remain 500 feet below, 1,000 feet above, and 2,000 feet horizontal distances away from clouds.

Class C airspace in Washington includes Spokane International Airport, two military facilities, Fairchild Air Force Base and Naval Air Station (NAS) Whidbey Island, and the area in southwest Washington where airspace associated with the Portland International Airport impacts operations at airports within Clark County.

Class "D" Airspace

For all intents and purposes, Class D airspace is associated with any other airport that has a control tower. Class D airspace extends from the surface up to 2,500 feet, with a radius of five miles. There may be "keys" that extend out from the circle to protect instrument approaches.

Aircraft may operate VFR in Class D airspace if they establish two-way radio communications before entry. Pilots must have three miles of visibility, and remain 500 feet below, 1,000 feet above, and 2,000 feet horizontal distances away from clouds.

Class D airspace in Washington exists at the following towered airports;

1. Walla Walla City-County
2. King County International/Boeing Field
3. Bellingham International
4. Grant County International
5. Olympia Regional
6. Snohomish County/Paine Field
7. Tri-Cities
8. Renton Municipal
9. Felts Field
10. Tacoma Narrows
11. Yakima Air Terminal

Class "E" Airspace

The definition for Class E Airspace is complicated because it covers the all airspace not designated in above classes. If it is Controlled Airspace, and it is not A, B, C, or D, then it is Class "E". All of the airways (the "V Routes") are in this airspace. It commences at 14,500 feet and extends up to 18,000 feet.

Aircraft can operate VFR in this airspace, however they must have three miles of visibility, and remain 500 feet below, 1,000 feet above, and 2,000 feet horizontal distances away from clouds.

Non Regulatory Airspaces

Included under this category are Prohibited areas, MOA's (Military Operating Areas), Warning Areas, Alert Areas, Controlled Firing areas and other specialty use airspace.

Prohibited Areas

These are designated for national security, or national welfare. For example, the White House has prohibited airspace above it. There are no prohibited areas in Washington State.

Restricted Areas

This is a category that covers everything from test flight areas to missile tests and artillery or aerial gunnery ranges. The restricted area may or may not be "hot", or active. Before operating in these areas, the pilot needs to check with the nearest ATC facility to find out the current status. If the area is not active, operations in VFR are permitted. ATC will not allow aircraft in if the area is "hot." Three such restricted areas exist in the state. These are

1. Whidbey Island Naval Air Station (NAS Whidbey) – R6701
2. Yakima Firing Range – R-6714A and B
3. Umitilla (located in Oregon but parts extend into Washington) – R-5701 and R- 5706

Warning Areas

Warning areas extend from three miles off the U.S. coastlines and continue outward. They contain "....activity that may be hazardous to nonparticipating aircraft." There are warning areas off the entire coast of Washington State. These are designated as W- 237, A, B, C, D, & E.

MOAs, Military Operating Areas

MOAs are established as areas where military pilots can practice. The areas can be of any size or shape. If non-military aircraft are operating under IFR within these areas, ATC will provide the proper separation while within a MOA but VFR flights are permitted on a see-and-be-seen basis. It is strongly suggested that VFR operations contact the controlling facility to check on the MOA's status. ATC will provide separation for all VFR flights that contact them.

Several MOAs exist over Washington State in support of the numerous military facilities including;

1. Olympic A MOA
2. Olympic B MOA
3. Chinook A
4. Chinook B
5. Rainier 1, 2 & 3
6. Okanogan A, B & C
7. Roosevelt A & B
8. Boardman

ADIZ, Air Defense Identification Zones

These zones are located over the water, along the East Coast and West Coast, around Hawaii and Guam. They are there to protect the country from potentially hostile aircraft. If an aircraft is operating under IFR, ATC will handle the coordination with the military. If they are VFR, they must file a DVFR flight plan.

ADIZs exist all along the coast of Washington State.

Victor Airway

The Victor Airway routes connect radio navigation beacons called "very high frequency omnidirectional range" or VOR stations that radiate a signal in all directions. These stations are usually located at or near airports. North-south Victor Airways have odd numbers while east-west airways have even numbers. These Federal or Victor Airways are used by both IFR and VFR aircraft. The airspace set aside for a Victor Airway is eight miles wide with a floor at 1,200 AGL; they extend up to FL 180 (18,000' msl).

Military Training Routes

Each Military Training Route has its own identification, and the identifier has two parts. "VR" means that pilots flying the training routes will be flying under visual flight rules. "IR" means the pilots will be flying under instrument flight rules. The second part of the identifier is either a three or a four-digit number. Four digits means the route will be flown at or below 1,500 feet AGL, a three-digit number means the route will be flown both below and above 1,500 feet. Thus, VR-1260 means a training route flown under VFR at a relatively low level. IR-141 would be a route flown under IFR conditions at any level.

Aircraft Operations Capacity - NPIAS Airports

Site ID	Airport Name	NPIAS Role	WSDOT Role	2005 Operations	Annual Service Volume	2005 Operations as% of ASV	Reserve Capacity
Primary Airports (12)							
26109.A	Bellingham International	Primary	Commercial Service	82,432	230,000	35.8%	64.2%
26219.4A	Friday Harbor	Primary	Commercial Service	60,000	138,000	43.5%	56.5%
26307.A	Grant County International	Primary	Commercial Service	85,553	470,000	18.2%	81.8%
26248.C	Kenmore Air Harbor, Inc.	Primary	Commercial Service	40,000	56,250	71.1%	28.9%
26461.A	Pangborn Memorial	Primary	Commercial Service	50,050	230,000	21.8%	78.2%
26372.A	Pullman/Moscow Regional	Primary	Commercial Service	72,439	195,000	37.1%	62.9%
26395.A	Sea-Tac International	Primary	Commercial Service	341,471	533,041	64.1%	35.9%
26416.A	Spokane International	Primary	Commercial Service	99,366	215,000	46.2%	53.8%
26345.A	Tri-Cities	Primary	Commercial Service	87,952	260,000	33.8%	66.2%
26450.A	Walla Walla Regional	Primary	Commercial Service	35,318	310,000	11.4%	88.6%
26357.A	Wm. R. Fairchild International	Primary	Commercial Service	49,700	230,000	21.6%	78.4%
26480.A	Yakima Air Terminal	Primary	Commercial Service	49,388	230,000	21.5%	78.5%
Commercial Service (4)							
26098.1A	Anacortes	Commercial	Commercial Service	16,900	230,000	7.3%	92.7%
26125.1A	Skagit Regional	Commercial	Regional Service	61,580	270,000	22.8%	77.2%
26396.A	Boeing Field/King County Int'l	Commercial	Commercial Service	300,478	380,000	79.1%	20.9%
26190.*A	Orcas Island	Commercial	Commercial Service	58,272	230,000	25.3%	74.7%
Reliever (5)							
26103.11 A	Auburn Municipal	Reliever	Regional Service	153,618	231,000	66.5%	33.5%
26417.A	Felts Field	Reliever	Regional Service	68,649	230,000	29.8%	70.2%
26411.A	Harvey Field	Reliever	Regional Service	139,859	230,000	60.8%	39.2%
26381.A	Renton Municipal	Reliever	Regional Service	87,226	230,000	37.9%	62.1%
26210.A	Snohomish County/Paine Field	Reliever	Regional Service	150,220	316,218	47.5%	52.5%
General Aviation (46)							
26099.A	Arlington Municipal	GA	Regional Service	137,737	270,000	51.0%	49.0%
26236.A	Bowerman Field	GA	Regional Service	19,899	97,500	20.4%	79.6%
26195.A	Bowers Field	GA	Regional Service	55,000	198,700	27.7%	72.3%
26120.*A	Bremerton National	GA	Regional Service	55,000	240,000	22.9%	77.1%
19614.*A	Columbia Gorge Reg/The Dalles	GA	Regional Service	46,650	230,000	20.3%	79.7%
26184.A	Deer Park Municipal	GA	Regional Service	31,552	230,000	13.7%	86.3%
26246.A	Kelso-Longview	GA	Regional Service	38,850	230,000	16.9%	83.1%
26327.A	Olympia	GA	Regional Service	83,050	230,000	36.1%	63.9%
26330.A	Omak	GA	Regional Service	19,175	230,000	8.3%	91.7%
26386.1A	Richland	GA	Regional Service	22,377	115,000	19.5%	80.5%
26405.A	Sanderson Field	GA	Regional Service	44,209	230,000	19.2%	80.8%
26434.4A	Tacoma Narrows	GA	Regional Service	88,423	240,000	36.8%	63.2%
26123.1A	Anderson Field	GA	Local Community > 10	18,900	120,750	15.7%	84.3%
26135.A	Cashmere Dryden	GA	Local Community > 10	11,150	230,000	4.8%	95.2%
26147.A	Chelan Municipal	GA	Local Community > 10	4,000	120,750	3.3%	96.7%
26165.A	Colville Municipal	GA	Local Community > 10	19,200	230,000	8.3%	91.7%
26181.A	Davenport Municipal	GA	Local Community > 10	7,000	120,750	5.8%	94.2%
26333.A	Dorothy Scott Municipal	GA	Local Community > 10	12,600	230,000	5.5%	94.5%

Site ID	Airport Name	NPIAS Role	WSDOT Role	2005 Operations	Annual Service Volume	2005 Operations as% of ASV	Reserve Capacity
26204.A	Ephrata Municipal	GA	Local Community > 10	134,618	230,000	58.5%	41.5%
26323.4A	Odessa Municipal	GA	Local Community > 10	8,200	230,000	3.6%	96.4%
26336.2A	Othello Municipal	GA	Local Community > 10	30,000	120,750	24.8%	75.2%
26369.A	Prosser	GA	Local Community > 10	12,200	230,000	5.3%	94.7%
26389.1A	Rosalia Municipal	GA	Local Community > 10	7,000	230,000	3.0%	97.0%
26428.A	Sunnyside Municipal	GA	Local Community > 10	24,000	230,000	10.4%	89.6%
26162.A	Whitman County Memorial	GA	Local Community > 10	12,000	230,000	5.2%	94.8%
26471.A	Wilbur Municipal	GA	Local Community > 10	9,300	230,000	4.0%	96.0%
26116.A	Blaine Municipal	GA	Local Community >10	7,000	230,000	3.0%	97.0%
26144.A	Chehalis Centralia	GA	Local Community >10	46,874	210,000	22.3%	77.7%
26130.A	Grove Field	GA	Local Community >10	5,000	230,000	2.2%	97.8%
26363.A	Jefferson County International	GA	Local Community >10	51,643	230,000	22.5%	77.5%
26274.7A	Lopez Island	GA	Local Community >10	35,674	230,000	15.5%	84.5%
26444.A	Pearson Field	GA	Local Community >10	48,120	180,000	26.7%	73.3%
26374.1A	Pierce County/Thun Field	GA	Local Community >10	90,000	213,200	42.2%	57.8%
26437.A	Ed Carlson Memorial Airport	GA	Local Community >10	36,363	172,500	21.1%	78.9%
26193.1A	Grand Coulee Dam	GA	Local Community < 10	11,750	120,750	9.7%	90.3%
26323.21 A	Ocean Shores Municipal	GA	Local Community < 10	5,800	120,750	4.8%	95.2%
26388.A	Pru Field	GA	Local Community < 10	5,500	230,000	2.4%	97.6%
26159.A	Cle Elum Municipal	GA	Local Community <10	1,000	120,750	0.8%	99.2%
26341.A	Packwood	GA	Local Community <10	9,650	172,500	5.6%	94.4%
26240.5A	Ione Municipal	GA	Recreation/Remote	2,700	120,750	2.2%	97.8%
26376.5A	Quillayute	GA	Recreation/Remote	568	230,000	0.2%	99.8%
26448.A	Vashon Municipal	GA	Recreation/Remote	6,000	120,000	5.0%	95.0%
26266.2A	Whidbey Airpark	GA	Recreation/Remote	14,273	172,500	8.3%	91.7%
26219.1C	Friday Harbor SPB	GA	Seaplane Base	NR	230,000	NC	NC
26477.A	Methow Valley	State	Recreation/Remote	7,650	120,750	6.3%	93.7%
26395.5* C	Kenmore Air Harbor SPB/ Lake Union	None	Seaplane Base	73,600	60,000	122.7%	-22.7%

Washington Public Use Airports

Airport	City	County	Sponsor (Owner)	FAA Service Level
American Lake SPB	Tacoma	Pierce	City of Lakewood	None
Anacortes	Anacortes	Skagit	Port of Anacortes	CM
Anderson Field	Brewster	Okanogan	City of Brewster	GA
Arlington Municipal	Arlington	Snohomish	City of Arlington	GA
Auburn Municipal	Auburn	King	City of Auburn	RL
Avey Field State	Laurier	Ferry	WSDOT Aviation	None
Bandera State	Bandera	King	WSDOT Aviation	None
Bellingham International	Bellingham	Whatcom	Port of Bellingham	PR
Blaine Municipal	Blaine	Whatcom	City of Blaine	GA
Boeing Field/King County International	Seattle	King	King County	PR
Bowerman Field	Hoquiam	Grays Harbor	Port of Grays Harbor	GA
Bowers Field	Ellensburg	Kittitas	Kittitas County	GA
Bremerton National	Bremerton	Kitsap	Port of Bremerton	GA
Camano Island Airfield	Stanwood	Island	Steven & Norma Knopp	None
Cashmere Dryden	Cashmere	Chelan	Chelan County	GA
Cedars North Airpark	Battle Ground	Clark	Cedars Homeowners Ass	None
Chehalis Centralia	Chehalis	Lewis	City of Chehalis/Lewis County	GA
Chelan Municipal	Chelan	Chelan	City of Chelan/Port of Chelan	GA
Cle Elum Municipal	Cle Elum	Kittitas	City of Cle Elum	GA
Columbia Gorge Regional/The Dalles	The Dalles	Klickitat	City of the Dalles/Klickitat County	None
Colville Municipal	Colville	Stevens	City of Colville	GA
Concrete Municipal	Concrete	Skagit	City of Concrete	None
Copalis State	Copalis	Grays Harbor	WSDOT Aviation	None
Crest Airpark	Kent	King	Norm Grier/Rikki Birge	None
Cross Winds	Clayton	Spokane	Lynden P Brown	None
Darrington Municipal	Darrington	Snohomish	Town of Darrington	None
Davenport Municipal	Davenport	Lincoln	City of Davenport	GA

Airport	City	County	Sponsor (Owner)	FAA Service Level
Deer Park Municipal	Deer Park	Spokane	City of Deer Park	GA
Desert Aire	Mattawa	Grant	Desert Aire Owner's Association	None
DeVere Field	Cle Elum	Kittitas	James De Vere	None
Dorothy Scott Municipal	Oroville	Okanogan	City of Oroville	GA
Easton State	Easton	Kittitas	WSDOT Aviation	None
Elma Municipal	Elma	Grays Harbor	Jack Duffy	None
Ephrata Municipal	Ephrata	Grant	Grant County Port District No 9	GA
Evergreen Field*	Vancouver	Clark	Helanor Olson	None
Felts Field	Spokane	Spokane	City of Spokane/Spokane County	RL
Ferry County	Republic	Ferry	Ferry County	None
Firstair Field	Monroe	Snohomish	Daryl Habich	None
Floathaven SPB	Bellingham	Whatcom	MELLEMARK, INC	None
Fly For Fun	Vancouver	Clark	George Manley	None
Forks Municipal	Forks	Clallam	City of Forks	None
Friday Harbor	Friday Harbor	San Juan	Port of Friday Harbor	PR
Friday Harbor SPB	Friday Harbor	San Juan	Port of Friday Harbor	GA
Goheen Field	Battle Ground	Clark	Gordon Goheen	None
Goldendale Municipal	Goldendale	Klickitat	City of Goldendale	None
Grand Coulee Dam	Electric City	Grant	Port of Grant County No 7	GA
Grant County International	Moses Lake	Grant	Port of Moses Lake	CM
Grove Field	Camas	Clark	Port of Camas Washougal	GA
Harvey Field	Snohomish	Snohomish	K. Harvey	RL
Hillcrest	Goldendale	Klickitat	William Nelson	None
Hoskins Field	Olympia	Thurston	Chambers Estate Ass	None
Ione Municipal	Ione	Pend Oreille	City of Ione	GA
Jefferson County International	Port Townsend	Jefferson	Port of Port Townsend	GA
J-Z	Almira	Lincoln	Town of Almira	None
Kelso-Longview	Kelso	Cowlitz	City of Kelso	GA
Kenmore Air Harbor SPB	Kenmore	King	Gregg Munro	None

Airport	City	County	Sponsor (Owner)	FAA Service Level
Kenmore Air Harbor, Inc.	Seattle	King	Greg Munro	GA
Lake Wenatchee State	Leavenworth	Chelan	WSDOT Aviation	None
Lester State	Lester	King	WSDOT Aviation	None
Lind Municipal	Lind	Adams	City of Lind	None
Little Goose Lock & Dam State	Starbuck	Columbia	WSDOT Aviation	None
Lopez Island	Lopez	San Juan	Port of Lopez	GA
Lost River Airport	Mazama	Okanogan	Lost River ART Ass	None
Lower Granite State	Colfax	Whitman	WSDOT Aviation	None
Lower Monumental State	Kahlotus	Walla Walla	WSDOT Aviation	None
Lynden Municipal	Lynden	Whatcom	City of Lynden	None
Mansfield	Mansfield	Douglas	Port of Douglas County	None
Martin Field	College Place	Walla Walla	David Cheney	None
Mead Airport	Mead	Spokane	Patricia Erickson	None
Methow Valley	Winthrop	Okanogan	WSDOT Aviation	GA
Moses Lake Municipal	Moses Lake	Grant	City of Moses Lake	None
New Warden	Warden	Grant	City of Warden	None
Ocean Shores Municipal	Ocean Shores	Grays Harbor	City of Ocean Shores	GA
Odessa Municipal	Odessa	Lincoln	City of Odessa	GA
Okanogan Legion	Okanogan	Okanogan	City of Okanogan	None
Olympia	Olympia	Thurston	Port of Olympia	GA
Omak	Omak	Okanogan	City of Omak	GA
Orcas Island	Eastsound	San Juan	Port of Orcas	CM
Othello Municipal	Othello	Adams	Port of Othello	GA
Packwood	Packwood	Lewis	Lewis County	GA
Pangborn Memorial	Wenatchee	Douglas	Port of Chelan/Port of Douglas	PR
Pearson Field	Vancouver	Clark	City of Vancouver	GA
Pierce County/Thun Field	Puyallup	Pierce	Pierce County	GA
Point Roberts Airpark	Point Roberts	Whatcom	Robin Lamb	None
Port of Ilwaco	Ilwaco	Pacific	Port of Ilwaco	None
Poulsbo SPB	Poulsbo	Kitsap	Port of Poulsbo	None
Prosser	Prosser	Benton	Port of Benton	GA

Airport	City	County	Sponsor (Owner)	FAA Service Level
Pru Field	Ritzville	Adams	City of Ritzville	GA
Pullman/Moscow Regional	Pullman / Moscow, ID	Whitman	City of Pullman/City of Moscow	PR
Quillayute	Quillayute	Clallam	City of Forks	GA
Quincy Municipal	Quincy	Grant	City of Quincy	None
R & K Skyranch	Rochester	Thurston	Skyranch Group	None
Ranger Creek State	Greenwater	Pierce	WSDOT Aviation	None
Renton Municipal	Renton	King	City of Renton	RL
Richland	Richland	Benton	Port of Benton	GA
Roche Harbor SPB	Roche Harbor	San Juan	WASHINGTON STATE	None
Rogersburg State	Anatone	Asotin	WSDOT Aviation	None
Rosalia Municipal	Rosalia	Whitman	Town of Rosalia	GA
Rosario SPB	Rosario	San Juan	Rosario Resort	None
Sand Canyon	Chewelah	Stevens	City of Chewelah	None
Sanderson Field	Shelton	Mason	Port of Shelton	GA
Sea-Tac International	Seattle	King	Port of Seattle	PR
Sekiu	Sekiu	Clallam	Port of Port Angeles	None
Sequim Valley	Sequim	Clallam	Winifred Sallee	None
Shady Acres	Spanaway	Pierce	Shady Acres APT Inc	None
Skagit Regional	Burlington/Mount Vernon	Skagit	Port of Skagit County	GA
Sky Harbor	Sultan	Snohomish	Barry A Hammer	None
Skykomish State	Skykomish	King	WSDOT Aviation	None
Skyline SPB	Anacortes	Skagit	Skyline Marina Inc.	None
Snohomish County/Paine Field	Everett	Snohomish	Snohomish County	RL
Spanaway	Spanaway	Pierce	Spanaway Airport	None
Spokane International	Spokane	Spokane	City of Spokane/Spokane County	PR
Stehekin State	Stehekin	Chelan	WSDOT Aviation	None
Strom Field	Morton	Lewis	City of Morton	None
Sullivan Lake State	Metaline Falls	Pend Oreille	WSDOT Aviation	None
Sunnyside Municipal	Sunnyside	Yakima	City of Sunnyside	GA

Airport	City	County	Sponsor (Owner)	FAA Service Level
Swanson Field	Eatonville	Pierce	Town of Eatonville	None
Tacoma Narrows	Tacoma	Pierce	City of Tacoma	GA
Tieton State	Rimrock	Yakima	WSDOT Aviation	None
Ed Carlson Memorial Airport	Toledo	Lewis	Lewis County	GA
Tonasket Municipal	Tonasket	Okanogan	Town of Tonasket	None
Tri-Cities	Pasco	Franklin	Port of Pasco	PR
Twisp Municipal	Twisp	Okanogan	City of Twisp	None
Vashon Municipal	Vashon	King	King County Airport District #1	GA
Vista Field	Kennewick	Benton	Port of Kennewick	None
Walla Walla Regional	Walla Walla	Walla Walla	Port of Walla Walla	PR
Waterville	Waterville	Douglas	Port of Douglas County	None
Wes Lupien	Oak Harbor	Island	Air International LLC	None
Western Airpark	Yelm	Thurston	Western Airpark HOA	None
Westport	Westport	Grays Harbor	City of Westport	None
Whidbey Airpark	Langley	Island	Whidbey Air Park LLC	GA
Whitman County Memorial	Colfax	Whitman	Whitman County	GA
Wilbur Municipal	Wilbur	Lincoln	City of Wilbur	GA
Will Rogers Wiley Post SPB	Renton	King	City of Renton	None
Willapa Harbor	South Bend (Raymond)	Pacific	Port of Willapa Harbor	None
Willard Field	Tekoa	Whitman	City of Tekoa	None
Wilson Creek	Wilson Creek	Grant	Town of Wilson Creek	None
Wm. R. Fairchild International	Port Angeles	Clallam	Port of Port Angeles	PR
Woodland State	Woodland	Cowlitz	WSDOT Aviation	None
Yakima Air Terminal	Yakima	Yakima	City of Yakima/ Yakima County	PR

*Airport recently closed.

CM = Commercial Service-Nonprimary Airport
PR = Commercial Service-Primary Airport
GA = General Aviation Airport
RL = Reliever Airport

Source: National Plan of Integrated Airport Systems (2005-2009), published in 2004.

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APPENDIX C: COMMUNICATION PLAN

Washington State Long-term Air Transportation Study (LATS)
Public Outreach and Involvement

Washington State Long-term Air Transportation Study (LATS)
Washington State Department of Transportation, Aviation

Public Communication or Public Involvement

WSDOT is committed to proving and implementing an intensive outreach effort throughout the Washington State Long-term Air Transportation Study (LATS.)

The communications plan has been drafted in accordance with FAA Advisory Circular (AC) No. 150/5070-7 *Airport System Planning and FAA's Community Involvement Manual,* FAA-EE-90-03, which provides guidance on system planning public involvement and stakeholder consultation. The FAA Advisory Circular states specifically that:

Appropriate coordination of study drafts with the aviation public, community organizations, airport sponsors and users, and other interested parties is critical to the successful adoption and implementation of the final planning report. It is important that all affected or potentially affected parties perceive that the process is open, that the opportunity for participation exists, and that the study is designed to consider input from all of them.

The following plan embraces that philosophy to assure that the resultant system plan supports the public's best interest.

Background

In 2005, the Washington State Legislature adopted Engrossed Substitute Senate Bill (ESSB) 5121, which requires the Washington State Department of Transportation (WSDOT) to assess Washington State's aviation facilities. The information will then be used by a Governor-appointed planning council to make recommendations on what is needed to meet future air transportation demand.

WSDOT will embark upon this comprehensive airport system study – also known as the Washington State Long-term Air Transportation Study (LATS) - in conjunction with the Federal Aviation Administration (FAA). The FAA will provide a majority of the funding for LATS, with supporting grants from WSDOT and the Washington State Legislature.

Also as part of LATS, a $50,000 state-funded and appropriated grant will be used to evaluate high-speed passenger rail. This evaluation will broadly study existing materials on how rail may be used to more efficiently utilize airport capacity by connecting airports. This effort will be coordinated as part of Phase II of LATS.

The product of LATS will be a cost-effective action plan to develop Washington State airports consistent with established goals and objectives. The process will also result in establishing perspectives on aviation priorities, such as airport roles, funding, policy strategies, and system trends. It will also identify the roles and characteristics of existing and recommended new airports, describe the overall development required at each, and include timeframes and estimated project costs. This will ensure that aviation plans remain responsive to the overall statewide air transportation needs.

Approach

LATS will encompass three phases:

- Phase I includes a review of airport inventory and capacity.
- Phase II includes detailed activity forecasts for each airport, market analysis of the commercial airports, a high-speed rail review, air cargo study and future capacity assessment.
- Phase III will involve the formation of a Governor's council to review the fact finding in Phases I and II and determine long-term airport development priorities to guide investment decisions.

System Plan Components

The overall goal of any state airport system planning process is to ensure the statewide system of airports are safely, efficiently, and adequately serving immediate and long-term air transportation needs. The system plan for Washington will include 139 public-use airports. Its main components will include:

1) Inventory of the current airport system
2) Identification of air transportation needs
3) Forecast of system demand
4) Consideration of alternative airport systems

5) Definition of airport roles and policy strategies
6) Recommendation of system changes, funding strategies, airport development
7) Preparation of an implementation plan
8) Exploration of issues that impact aviation in the study area
9) Special studies that may include high-speed rail, air cargo and commercial airport analysis
10) Performed in the context of a highly visible platform that includes strong public outreach efforts

WSDOT's system planning efforts do not include:

- Master planning
- Environmental planning
- Site selection studies for new airport facilities

A system plan serves as an important contribution to the FAA's National Plan of Integrated Airport Systems (NPIAS). The FAA's NPIAS is a national plan, updated every two years, that identifies for each state specific airport improvements that will contribute to achieving FAA goals. The NPIAS supports the FAA's strategic goals for safety, system efficiency, and environmental compatibility. Aviation system planning fits between the FAA's national planning effort, as documented in the NPIAS, and contributes to more detailed master and capital improvement plans for each individual airport.

Situation Analysis

Washington's aviation system is a public-private partnership comprised of 139 public-use airports. Airports are an essential component of Washington State's overall transportation system, providing critical links to people, goods, and services. They are a lifeline to and from isolated rural communities, especially for medical and emergency services, and enhance the quality of life for residents in their work and leisure. Additionally, airports allow for easy access by out-of-state visitors, supporting Washington's tourism business.

WSDOT's Aviation Policy Framework

It is in the State's interest that:

- **Aviation facilities and services be preserved that provide access for all regions of the state to the nation's air transportation system, provide for emergency management, and support local economies.**
- **Transportation by air be safe.**
- **There be sufficient airport capacity to respond to growth in demand to ensure access across the state, the nation and the world.**
- **Negative environmental impacts of airports on people and the natural environment be mitigated.**

Airports play a vital role in the state's economy by facilitating jobs

and commerce. According to an economic impact report from 2001, Washington's airport system annually generates 171,311, $4 billion in wages, and $18.5 billion in annual sales output. In spite of its importance to the state economy, inadequate planning, an antiquated funding base, a fluctuating economy and local land use conflict threaten the long-term health of Washington's aviation system.

In its 2004 policy development process, WSDOT Aviation was requested by its Aviation Advisory Committee to address three questions:

- Is Washington positioned to respond to a rapidly changing aviation environment?

- Is Washington using it's limited resources effectively and efficiently to meet the state's long-term interests in Aviation? What should the key priorities be?

- What strategic changes need to be made to satisfy the state's aviation policy, i.e., preservation, safety, capacity and environmental protection?

With input of key stakeholders, including intensive work by study groups on system planning, education and outreach, and safety, WSDOT Aviation identified key issues and goals needed to satisfy Washington State's interest in a healthy aviation system. The study groups were comprised of local elected and planning officials, airport representatives, pilot organizations, universities and members of the State Legislature.

The System Planning Study Group identified policy issues and system plan goals that included:

- Maximize value of public investment in the aviation system statewide.

- Increase consistency and collaboration between FAA, State of Washington, and local aviation policies, rules, and regulations by class of airport recognizing that different types of airports have different regulatory and policy needs.

- Assure adequate capacity to accommodate future aviation system needs, especially through airport preservation and enhancement.

- Anticipate and strategically respond to emerging aviation system trends and issues.

- Strive to maintain serviceability and fairness in current public investments in the aviation system, taking into account different classes of airports.

The System Plan Study Group also identified the need for additional data, necessary to better define the system and its strategic priorities, including:

- Gaps in availability of aviation facilities for emergency medical, fire fighting, disaster relief, national defense and air taxi needs
- System wide performance, role and interrelationship of airports
- Future capacity needs
- Projected cargo needs
- Gaps in airport capacity that may inhibit economic development of rural areas, or that prevent full participation of rural communities in political processes at the state level
- Reliever airports that are necessary to meet general aviation needs near large commercial airports, which if unmet would increase congestion at the commercial airports
- Capacity of reliever airports to continue to meet the demands of GA aircraft

It is in response to these recommendations and the subsequent legislative direction set forth in ESSB 5121 that the Washington State LATS is being conducted.

Public Outreach / Public Involvement Objectives

Increase public awareness about the study
This project is a three-phase approach to determine "what we have, what we need, and how we get there" in terms of air transportation capacity in Washington State. It is important to be proactive about communicating this message. Outreach objectives are to:

- Increase public awareness about the project
- Prevent surprises: actively engage the public
- Minimize misperceptions about what the study is and what it is not
- Promote use of the Web as primary source of information
- Document stakeholder/public involvement

- Minimize negative media coverage
- Engage public in decision making and gather concerns, questions and ideas

Key Audiences

Audience	Priority Concerns	Outreach Recommendations
Legislature	o Delivery of technically sound system plan to be used for the basis of making long-term airport investment decisions o Local constituent concerns o Intermodal integration and efficiency	o Initial interviews to gain perspective of expectations o Ongoing coordination with legislative staff o Regular briefings o Clear messaging about study purpose and outcomes
Airports	o Data collection /airport inventory and overall fact finding data reported accurately o Opportunity to contribute to a comprehensive plan for future airport development o Determining each airport's existing and future role within the state airport system	o Start early and disseminate study goals, objectives and tasks early
Urban Communities	o Impacts of capacity recommendations o Impacts on airport planning and investment o Land use conflicts o Noise o Traffic o Environmental impacts o GMA and other planning implications	o Clear messaging about study purpose and outcomes as well as what the study does not include o Multiple opportunities for involvement o Easily accessible information, presented in simple formats – leverage website and existing aviation forums / associations / meetings
Rural Communities	o Relationship to local land uses o Economic development o Funding o Emergency access o Community impacts	
General aviation pilots	o Airport maintenance o Funding of airport maintenance o Funding equity o Availability of airports o Stability of Search and	o Outreach to identify deficiencies in general aviation airports o Clarity about how designation hierarchy works

	Rescue functions	o Easily accessible information, presented in simple formats
Airlines	o Impact on long term facility and services planning o Taxes o Costs	o Involvement in any recommendations about aviation funding o Clear information about decision process
RTPO's/MPO's	o Consistency with regional/metropolitan transportation plans o Economic development o Access to emergency services o Impact on transportation facilities o Intermodal connections to airports o Regional airport capacity o Compatible land use o GMA implications	o Clear messaging about study purpose and outcomes, including presenting information relevant to rural areas o Multiple opportunities for involvement o Easily accessible information, presented in simple formats o Clear information about decision process
Business communities	o Economic development o Impacts on costs of doing business o Impacts on distribution systems	o Clear messaging about study purpose and outcomes o Multiple opportunities for involvement o Easily accessible information, presented in simple formats
Association of Washington Cities/Counties	o Economic development o Similar to other concerns listed above o Impact on land use	o Clear messaging about study purpose and outcomes, including presenting information relevant to rural areas o Multiple opportunities for involvement o Easily accessible information, presented in simple formats o Clear information about decision process
Washington Chapter of the American Planning Association (WA-APA)	o Land use planning o Economic and social issues o Transportation system integration o Land use o Capital facility	o Clear messaging about study purpose and outcomes, including presenting information relevant to rural areas o Multiple opportunities for involvement o Easily accessible information, presented in simple formats o Clear information about decision process

Rail / Freight	o High-speed passenger rail connectivity with major urban areas o Alternate modes of transportation	o Multiple opportunities for involvement

Strategies

- Keep local media and key audiences informed.
- Lead with the Web: Create a useful, interactive Web page and update news and milestones regularly.
- Promote project benefits using listserv, press releases, Web, ads, etc.
- Implement targeted communication efforts through regional public meetings.

Key Messages

- This study is a three-phase approach to determine "what we have," "what we need," and "what we need to do to get there."

- LATS will provide information and analysis through an open public process that will enable Washington leaders to make informed investment decisions about the aviation system and long-term airport development to meet future needs.

- Washington's aviation system generates hundreds of thousands of jobs and supports local economies throughout Washington State.

Team Members and Affiliations

WSDOT AVIATION TEAM
John Sibold, Director
John Shambaugh, Project Manager
Nisha Hanchinamani, Communications

CONSULTANT TEAM
Rita Brogan, CEO, PRR
Sonjia Murray, Project Manager, SH&E
Deborah Meehan, President, SH&E

Public Communications Tools and Tasks

Media Releases
WSDOT will issue media releases at key milestones in the progress of the LATS to announce dates of public outreach meetings and key study findings. All news releases will reinforce the key messages outlined in this communications plan.

Public Information Materials
Print materials will be made available to support public outreach that describes the purposes of LATS as well as information about the study findings as it progresses.

Website
WSDOT Aviation's website will feature a special section dedicated to the airport system plan that will include media releases, links to relevant publications, links to summaries of the Technical Advisory Committee meetings, links to relevant Web pages, information on LATS' progress, and opportunities for public involvement. Throughout the study process WSDOT Aviation will post finalized working paper, presentation materials, and other related reports. There will also be an interactive area for periodic public comment and to sign up for notification of meetings, reports, presentations, etc.

E-Newsletter
E-Newsletters will be issued to WSDOT Aviation's extensive database of aviation stakeholders to announce opportunities for public input, and to inform the public about study findings at periodic points in LATS. It is anticipated that, at a minimum, newsletters will be issued:

- To announce the study, introduce the Technical Advisory Committee and announce the upcoming Round #1 outreach meetings.
- To inform the community about the findings of the system inventory and to introduce the methodologies that will be employed during Phase II of LATS and announce the upcoming Round #2 outreach meetings.
- To discuss findings and next steps and to offer to brief stakeholder groups on LATS.

Aviation Technical Advisory Committee (ATAC)
A technical advisory committee has been assembled to assist WSDOT Aviation in the technical review of LATS. The purpose of the committee will be to work together towards a common set of objectives to ensure a consistent and comprehensive approach to the development of the air transportation study in accordance with state law.

The technical committee is made up of a diverse group of aviation and transportation-related professionals from varying geographical areas and backgrounds. ATAC is staffed with professionals possessing technical knowledge and expertise on multi-modal transportation issues, aviation system planning, airport operations, current and future industry trends, and market and capacity needs. They will provide important guidance to the study process.

It is anticipated the ATAC will hold four meetings during 2006:

- In Month One, review the study scope and work program
- In Month Five, review inventory findings and proposed methodologies for the commercial airport market analysis.
- In Month 12, review and comment on the commercial airport market analysis and airport activity forecasts.
- In Month 16 review and comment on the Phase II study findings.

Aviation Stakeholder Outreach

Outreach Meetings

During Phase I WSDOT Aviation will sponsor two rounds of four meetings to inform members of the aviation community, and interested members of the public about LATS. **Round One** meetings will set the stage by defining the scope and objectives for LATS. **Round Two** meetings will present information about the airport inventory and capacity analysis conducted during Phase I and educate the public about the issues related to Phase II, which will focus on airport activity forecasts, commercial airport market analysis, high-speed rail, air cargo, and future capacity analysis

Coordination with Regional Transportation/Metropolitan Planning Organizations (RTPO/MPOs)

The participation of RTPO's and MPO's will be actively sought during the study process. In addition to including these organizations in the on-going program outreach, the project team will seek to brief RTPO's at their quarterly coordination meetings in February, May, August, and November.

As part of the special rail study the consultant team will be coordinating with the RTPO/MPO planning groups to review past high-speed rail and aviation-related efforts. These planning groups will contribute information throughout the high-speed rail effort and the outcome will provide guidance to how high-speed rail can potentially support

Washington State's long-term transportation infrastructure needs.

On-line Surveys
WSDOT Aviation will conduct two separate electronic survey efforts eliciting feedback from those listed on its stakeholder database. The first online survey, to be issued shortly after the project starts, will identify information needs and elicit stakeholder feedback on aviation issues (such as aviation safety, capacity, system maintenance or land use compatibility). The second online survey will elicit feedback on issues related to airport inventory and capacity.

Aviation Advisory Committee
WSDOT Aviation's standing Aviation Advisory Committee will provide valuable insight in the progress and development of LATS. Presentations on LATS will be provided to this group at its quarterly meetings.

Organizational Briefings
WSDOT Aviation will be available to present information on study issues or findings when requested by local or regional government or aviation stakeholder groups.

APPENDIX D: GLOSSARY

AC - Advisory Circular
ADF - Automatic Direction Finder
ADIZ - Air Defense Identification Zones
ADPM - Average Day of the Peak Month
AFB - Air Force Base
AGL - Above Ground Level
AIP - Airport Improvement Program
ALP - Airport Layout Plan
ALS - Approach Lighting System
ALSF-1 - Approach Light System with Sequence Flasher Lights
ARC - Airport Reference Code
ARFF - Airport Rescue and Fire Fighting
ARP - Airport Reference Point
ARTCC - Air Route Traffic Control Center
ASDA - Accelerate-Stop Distance Available
ASOS - Automated Surface Observation System
ASR - Airport Surveillance Radar
ASV - Annual Service Volume
ATC - Air Traffic Control
ATCT - Air Traffic Control Tower
AVGAS - Aviation Gasoline
AWOS - Automated Weather Observation System
BRL - Building Restriction Line
CIP - Capital Improvement Program
dBA - A-weighted Decibels
DH - Decision Height
DME - Distance Measuring Equipment
DNL - Day-Night Sound Levels
DOT - Department of Transportation
EA - Environmental Assessment
EIS - Environmental Impact Statement
EP - Enplaned Passenger
EPA - The United States Environmental Protection Agency
EPF - Essential Public Facility
ESSB - Engrossed Senate Substitute Bill
FAA - Federal Aviation Administration
FAR - Federal Aviation Regulation
FBO - Fixed Based Operator

FIS - Federal Inspection Service
FSS - Flight Service Station
GA - General Aviation
GMA - Growth Management Act
GPS - Global Positioning System
HAT - Height Above Threshold
HIRL - High Intensity Runway Lights
ICAO - International Civil Aviation Organization
IFR - Instrument Flight Rules
ILS - Instrument Landing System
INM - Integrated Noise Model
LATS - Long Term Air Transportation Study
LDA - Landing Distance Available
LIRL - Low Intensity Runway Lights
MALS - Medium Intensity Approach Light System
MALSF - Medium Intensity Approach Light System with sequence flashing Lights
MALSR - Medium-Intensity Approach Lighting System with Runway Alignment Indicators
MGW - Maximum Gross Weight
MIRL - Medium Intensity Runway Lights
MLS - Microwave Landing System
MOA - Military Operations Area
MPO - Metropolitan Planning Organization
MSL - Mean Sea Level
NAS - Naval Air Station
NAVAID - Air Navigation Facility/Aid
NBAA - National Business Aircraft Association
NDB - Non-Directional Beacon
NPIAS - National Plan of Integrated Airport Systems
OAG - Official Airline Guide
OFA - Object Free Area
OFZ - Obstacle Free Zone
PAPI - Precision Approach Path Indicator
PCI - Pavement Condition Index
PFC - Passenger Facility Charge
PIR - Precision Instrument Runway
RAIL - Runway Alignment Indicator Lights
RCW - Revised Code of washington
REIL - Runway End Identifier Lights
RTPO - Regional Transportation Planning Organizations
RSA - Runway Safety Area

RPZ - Runway Protection Zone
RVR - Runway Visual Range
SPB - Sea Plane Base
TAF - FAA Terminal Area Forecasts
TODA - Take-Off Distance Available
TORA - Take-Off Run Available
VASI - Visual Approach Slope Indicator
VFR - Visual Flight Rules
VHF - Very High Frequency
WAAS - Wide Area Augmentation System
WTP - Washington Transportation Plan
WSCASP - Washington State Continuous Airport System Plan
WSDOT - Washington State Department of Transportation

Airport Abbreviations

Airport Name	Airport Id	Airport Name	Airport Id
NPIAS – Primary Airports			
		Seattle Tacoma International	SEA
Bellingham International	BLI	Spokane International	GEG
Friday Harbor	FHR	Tri-Cities	PSC
Boeing Field/King County International	BFI	Walla Walla Regional Service	ALW
Pangborn Memorial	EAT	Wm. R. Fairchild International	CLM
Pullman/Moscow Regional Service	PUW	Yakima Air Terminal	YKM
NPIAS – Commercial Airports			
Grant County International	MWH	Orcas Island/Eastsound	ORS
Anacortes	74S		
NPIAS - Reliever Airports			
Auburn Municipal	S50	Harvey Field	S43
Snohomish County/Paine Field	PAE	Renton Municipal/Clayton Scott Field	RNT
Felts Field	SSF		
NPIAS – General Aviation Airports			
Arlington Municipal	AWO	Rosalia Municipal	72S
Bowerman Field	HQM	Sunnyside Municipal	1S5
Bowers Field	ELN	Whitman County Memorial	S94
Bremerton National	PWT	Wilbur Municipal	2S8
		Blaine Municipal	4W6
Deer Park Municipal	DEW	Chehalis Centralia	CLS
Kelso-Longview	KLS	Grove Field	1W1
Olympia	OLM	Jefferson County International	0S9
Omak	OMK	Lopez Island	S31
Richland	RLD	Pearson Field	VUO
Sanderson Field	SHN	Pierce County/Thun Field	1S0
Skagit Regional	BVS	Ed Carlson Memorial Memorial	TDO
Tacoma Narrows	TIW	Grand Coulee Dam	3W7

Airport Name	Airport Id	Airport Name	Airport Id
Anderson Field	S97	Ocean Shores Municipal	W04
Cashmere Dryden	8S2	Pru Field	33S
Chelan Municipal	S10	Cle Elum Municipal	S93
Colville Municipal	63S	Packwood	55S
Davenport Municipal	68S	Ione Municipal	S23
Dorothy Scott Municipal	0S7	Quillayute	UIL
Ephrata Municipal	EPH	Vashon Municipal	2S1
Odessa Municipal	43D	Whidbey Airpark	W10
Othello Municipal	S70	Friday Harbor SPB	W33
Prosser	S40	Methow Valley	S52
Kenmore Air Harbor, Inc.	S60		
Non-NPIAS Airports			
Goldendale Municipal	S20	Fly For Fun	W56
Moses Lake Municipal	W20	Goheen Field	W52
Okanogan Legion	S35	Hillcrest	S20
Sand Canyon	1S9	Hoskins Field	44T
Tonasket Municipal	W01	J-Z	1W0
Waterville	2S5	Lake Wenatchee State	27W
Willard Field	73S	Lester State	
Concrete Municipal	3W5	Little Goose Lock & Dam State	16W
Ferry County	R49	Lost River Airport	W12
Lind Municipal	0S0	Lower Granite State	00W
Mansfield	8W3	Lower Monumental State	W09
New Warden	2S4	Lynden Municipal	38W
Quincy Municipal	80T	Martin Field	S95
Twisp Municipal	2S0	Mead Airport	70S
Vista Field	S98	Point Roberts Airpark	
Westport	14S	R & K Skyranch	8W9
Wilson Creek	5W1	Ranger Creek State	21W
Darrington Municipal	1S2	Rogersburg State	D69
Forks Municipal	S18	Sequim Valley	W28
Port of Ilwaco	7W1	Shady Acres	3B8
Sekiu	11S	Sky Harbor	S86
Strom Field	39P	Skykomish State	S88
Wes Lupien	76S	Spanaway	3B8
Willapa Harbor	2S9	Stehekin State	6S9
Avey Field State	69S	Sullivan Lake State	09S
Bandera State	4W0	Swanson Field	2W3
Camano Island Airfield	13W	Tieton State	4S6
Cedars North Airpark	W58	Western Airpark	92W
Copalis State	S16	Woodland State	W27
Crest Airpark	S36	American Lake SPB	W37
Cross Winds	C72	Floathaven SPB	0W7
Desert Aire	M94	Poulsbo SPB	83Q
DeVere Field	2W1	Roche Harbor SPB	W39
Easton State	ESW	Rosario SPB	W49
Elma Municipal	4W8	Skyline SPB	
Evergreen Field	59S		W36
Firstair Field	W16	Will Rogers Wiley Post SPB	
Kenmore Air Harbor/SPB/Lake Union	S60		
		Columbia Gorge Regional/The Dalles	DLS

Definitions

Active Aircraft - Aircraft registered with the FAA and reported to have flown during the preceding calendar year.

Activity - Used in aviation to refer to any kind of movement, e.g., cargo flights, passenger flights, or passenger enplanements. Without clarification it has no particular meaning.

Advisory Circular (AC) - A series of Federal Aviation Administration (FAA) publications providing guidance and standards for the design, operation and performance of aircraft and airport facilities.

Airport Improvement Program (AIP) - A congressionally mandated program through which the FAA provides funding assistance for the development and enhancement of airport facilities.

Air Cargo - Commercial freight, including express packages and mail, transported by passenger or all-cargo airlines.

Air Carrier - An airline providing scheduled air service for the commercial transport of passengers or cargo.

Air Navigation Facility (NAVAID) - Although generally referring to electronic radio wave transmitters (VOR, NDB, ILS), it also includes any structure or mechanism designed to guide or control aircraft involved in flight operations.

Air Route Traffic Control Center (ARTCC) - FAA-manned facility established to provide air traffic control services to aircraft operating in controlled airspace, en route between terminal areas. Although designed to handle aircraft operating under IFR conditions, some advisory services are provided to participating VFR aircraft when controller work loads permit.

Air Taxi - An air carrier certificated in accordance with FAR Part 135 and authorized to provide, on demand, public transportation of persons and property by aircraft. Air taxi operators generally operate small aircraft "for hire" for specific trips.

Air Traffic Hub - Air traffic hubs are not airports; they are cities and Metropolitan Statistical Areas requiring aviation services and may include more than one airport. Communities fall into four classes as determined by each

community's percentage of the total enplaned passengers by scheduled air carriers in the 50 United States, the District of Columbia, and other U.S. areas designated by the Federal Aviation Administration. Hub designations are determined by the following criteria:

1. Large Hub: 1.00 percent
2. Medium Hub: 0.25 percent to 0.99 percent (cont.)
3. Small Hub: 0.05 percent to 0.249 percent
4. Nonhub: Less than 0.05 percent.

Aircraft Approach Category - A grouping of aircraft based on a speed of 1.3 times the stall speed in the landing configuration at maximum gross landing weight. The aircraft approach categories are:

Category A - Speed less than 91 knots;
Category B - Speed 91 knots or more but less than 121 knots;
Category C - Speed 121 knots or more but less than 141 knots;
Category D - Speed 141 knots or more but less than 166 knots; and,
Category E - Speed 166 knots or more.

Aircraft Gate Position - An aircraft operational stand close to the terminal building and related to a specific passenger loading gate.

Aircraft Mix - The classification of aircraft into groups which are similar in size, noise, and operational characteristics.

Aircraft Operations - The airborne movement of aircraft. There are two types of operations: local and itinerant defined as follows:

1. Local Operations are performed by aircraft which:
   (a) operate in the local traffic pattern or within sight of the airport;
   (b) are known to be departing for or arriving from a local practice area.

2. Itinerant operations are all others.

Airfield - A defined area on land or water including any buildings, installations, and equipment intended to be used either wholly or in part for the arrival, departure or movement of aircraft.

Airplane Design Group - A grouping of airplanes based on wingspan. The groups are:

Group I:	Up to, but not including 49 feet
Group II:	49 feet up to, but not including 79 feet
Group III:	79 feet up to, but not including 118 feet
Group IV:	118 feet up to, but not including 171 feet
Group V:	171 feet up to, but not including 214 feet
Group VI:	214 feet up to, but not including 262 feet.

Airport Layout Plan (ALP) - An FAA required map of an airport depicting existing and proposed facilities and uses, with clearance and dimensional information showing compliance with applicable standards.

Airport Reference Code (ARC) - A coding system used to relate airport design criteria to the operational and physical characteristics of the airplanes intended to operate at the airport. It is a combination of the aircraft approach category and the airplane design group.

Airport Reference Point (ARP) - The location at which the designated latitude and longitude for an airport are measured.

Airport Service Area - The geographic area that generates demand for aviation services at an airport.

Airport Surveillance Radar (ASR) - Radar providing position of aircraft by azimuth and range data without elevation data. It is designed for a range of approximately 50 miles.

Airport Traffic Area - Unless otherwise specifically designated that airspace with a horizontal radius of five statute miles from the geographic center of any airport at which a control tower is operating, extending from the surface up to but not including 3,000 feet above the surface.

Airside - That portion of the airport facility where aircraft movements take place, airline operations areas, and areas that directly serve the

aircraft (taxiway, runway, maintenance, and fueling areas). Also called the airport operations area.

Airspace - The area above the ground in which aircraft travel. It is divided into corridors, routes, and restricted zones for the control and safety of aircraft.

All-Cargo Carrier - An air carrier certificated in accordance with FAR Part 121 to provide scheduled air freight, express, and mail transportation over specific routes, as well as the conduct of nonscheduled operations that may include passengers.

Alternate Airport - An alternate destination airport if flight to the original destination cannot be completed.

Annual Service Volume (ASV) - A reasonable estimate of an airport's annual capacity. It accounts for differences in runway use, aircraft mix, weather conditions, etc., that would be encountered over a year's time.

Approach End of Runway - The near end of the runway as viewed from the cockpit of a landing aircraft.

Approach Surface - An imaginary surface longitudinally centered on the extended runway centerline and extending outward and upward from each end of the primary surface. An approach surface is applied to each end of the runway based upon the planned approach. The inner edge of the approach surface is the same width as the primary surface and expands uniformly depending upon the planned approach.

Approved Instrument Approach - Instrument approach meeting the design requirements, equipment specifications, and accuracies, as determined by periodic FAA flight checks, and which are approved for general use and publication by the FAA.

Apron - A defined area where aircraft are maneuvered and parked and where activities associated with the handling of flights can be carried out.

AVGAS - Aviation gasoline. Fuel used in reciprocating (piston) aircraft engines. Avgas is manufactured in the following grades; 80/87, 100LL, 100/130, and 115/145.

Avigation Easement - A form of limited property right purchase that establishes legal land-use control prohibiting incompatible development of areas required for airports or aviation related purposes.

Based Aircraft - Aircraft stationed at an airport on an annual basis.

Capacity - (Throughput capacity). A measure of the maximum number of aircraft operations which can be accommodated on the airport component in an hour.

Capital Improvement Program (CIP) - A scheduled of planned projects and costs, often prepared and adopted by public agencies.

CAT I (one) - Category I Instrument Landing System which provides for approach to a height above touchdown of not less than 200 feet and with Runway Visual Range of not less than 1,800 feet.

CAT II (two) - Category II ILS approach procedure which provides for approach to a height above touchdown of not less than 100 feet and a RVR of not less than 1,200 feet.

CAT III (three) - Category III ILS approach which provides for an approach with no decision height and a RVR of not less than 700 feet.

Ceiling - The height above the ground of the base of the lowest layer of clouds or obscuring phenomena aloft that is reported as broken or overcast and not classified as scattered, thin, or partial. Ceiling figures in aviation weather reports may be determined as measured, estimated, or indefinite.

Charter - A nonscheduled flight offered by either a supplemental or certificated air carrier.

Circling Approach - An instrument approach procedure in which an aircraft executes the published instrument approach to one runway, the

maneuvers visually to land on a different runway. Circling approaches are also used at airports that have published instrument approaches with a final approach course that is not aligned within 30 degrees of any runway.

Clearway - A clearway is an area available for the continuation of the take-off operation which is above a clearly defined area connected to and extending beyond the end of the runway. The area over which the clearway lies need not be suitable for stopping aircraft in the event of an aborted take-off. Clearways are applicable only in the take-off operations of turbine-engined aircraft.

Commercial Air Carriers - An air carrier certificated in accordance with FAR Parts 121 or 127 to conduct scheduled services on specified routes. These air carriers may also provide nonscheduled or charter services as a secondary operation. Four carrier groupings have been designated for statistical and financial data aggregation and analysis:

1.	Majors:	Air carriers with annual operating revenues greater than $1 billion.
2.	Nationals:	Air carriers with annual operating revenues of between $100 million and $1 billion.
3.	Large Regionals:	Those carriers whose revenues are between $10 million and $99,999,999.
4.	Medium Regionals:	Air carriers with annual revenues less than $10 million.

Commuter Air Carrier - An air carrier certificated in accordance with FAR Part 135 which operates aircraft with a maximum of 60 seats, and provides at least five scheduled round trips per week between two or more points, or carries mail.

Commuter/Air Taxi Operations - Those arrivals and departures performed by air carriers certificated in accordance with FAR Part 135.

Conical Surface - An imaginary surface extending outward and upward from the periphery of the horizontal surface at a slope of 20:1 for a horizontal distance of 4,000 feet.

Control Areas - These consist of the airspace designated as Federal Airways, additional Control Areas, and Control Area Extensions, but do not include the Continental Control Areas.

Control Tower - A central operations facility in the terminal air traffic control system consisting of a tower cab structure using air/ground communications and/or radar, visual signaling, and other devices to provide safe and expeditious movement of air traffic.

Control Zones - Areas of controlled airspace which extend upward from the surface and terminate at the base of the continental control area. Control zones that do not underlie the continental control area have no upper limit. A control zone may include one or more airports and is normally a circular area with a radius of five statute miles and any extensions necessary to include instrument departure and arrival paths.

Controlled Airspace - Airspace designated as continental control area, control area, control zone, or transition area within which some or all aircraft may be subject to air traffic control.

Critical Aircraft - The aircraft which controls one or more design items based on wingspan, approach speed and/or maximum certificated take off weight. The same aircraft may not be critical to all design items.

dBA - Decibels measured on the A-weighted scale to factor out anomalies.

Decibel (dB) - The standard unit of noise measurement relating to a logarithm scale in which 10 units represents a doubling of acoustic energy.

Decision Height (DH) - During a precision approach, the height (or altitude) at which a decision must be made to either continue the approach or execute a missed approach.

Declared Distances - The distances the airport owner declares available and suitable for satisfying an airplane's take-off distance, accelerated-stop distance, and landing distance requirements. The distances are:

Take-off run available (TORA) - The runway length declared available and suitable for the ground run of an airplane taking off.

Take-off distance available (TODA) - The TORA plus the length of any remaining runway and/or clearway (CWY) beyond the far end of the TORA.

Accelerate-stop distance available (ASDA) - The runway plus stopway (SWY) length declared available and suitable for the acceleration and deceleration of an airplane aborting take-off.

Landing distance available (LDA) - The runway length declared available and suitable for a landing airplane.

Design Hour - The design hour is an hour close to the peak but not the absolute peak, which is used for airport planning and design purposes. It is usually the peak hour of the average day of the peak month.

Displaced Threshold - Actual touchdown point on specific runways designated due to obstructions which make it impossible to use the actual physical runway end.

Distance Measuring Equipment (DME) - An airborne instrument which indicates the distance the aircraft is from a fixed point, usually a VOR station.

Effective Runway Gradient - The maximum difference between runway centerline elevations divided by the runway length, expressed as a percentage.

Environmental Assessment (EA) - A report prepared under the National Environmental Policy Act (NEPA) analyzing the potential environmental impacts of a federally funded project.

Environmental Impact Statement (EIS) - A report prepared under NEPA fully analyzing the potential significant environmental impacts of a federally funded project.

EPA - The United States Environmental Protection Agency.

FAR Part 77 - Federal Aviation Regulations which establish standards for determining obstructions in navigable airspace.

Federal Aviation Administration (FAA) - A branch of the U.S. Department of Transportation responsible for the regulation of all civil aviation activities.

Fixed Base Operator (FBO) - An individual or company located at an airport providing commercial general aviation services.

Final Approach - The flight path of an aircraft which is inbound to the airport on an approved final instrument approach course, beginning at the point of interception of that course and extending to the airport or the point where circling for landing or missed approach is executed.

Fixed Wing - For the purposes of this report, any aircraft not considered rotorcraft.

Flight Plan - A description or outline of a planned flight which a pilot submits to the FAA, usually through a Flight Service Station.

Flight Service Station (FSS) - Air traffic facility operated by the FAA to provide flight service assistance such as pilot briefing, en route communications, search and rescue assistance and weather information.

General Aviation - All civil aviation operations other than scheduled air services and non-scheduled air transport operations for remuneration or hire.

Global Positioning System (GPS) - GPS uses a group of many satellites orbiting the earth to determine the position of users on or above the earth's surface. This system will provide at least non precision approach

capability to any airport having published instrument approach procedures.

Horizontal Surface - A horizontal plane 150 feet above the established airport elevation, the perimeter of which is constructed by swinging arcs with a radius of 5,000 feet for all runways designated as utility or general; and 10,000 feet for all other runways from the center of each end of the primary surface and connecting the adjacent arc by tangent lines.

Instrument Flight Rules (IFR) - These rules govern the procedures for conducting instrument flight. Pilots are required to follow these rules when operating in controlled airspace with visibility of less than three miles and/or ceiling lower than 1,000 feet.

Instrument Landing System (ILS) - ILS is designed to provide an exact approach path for alignment and descent of aircraft. Generally consists of a localizer, glide slope, outer marker, middle marker, and approach lights. This type of precision instrument system is being replaced by Microwave Landing Systems (MLS).

Instrument Runway - A runway equipped with electronic and visual navigation aids for which a precision or non precision approach procedure having straight-in landing minimums has been approved.

Itinerant Operation - All aircraft operations at an airport other than local.

Landing Area - That part of the movement area intended for the landing and takeoff of aircraft.

Local Operation - Aircraft operation in the traffic pattern or within sight of the tower, or aircraft known to be departing or arriving from flight in local practice areas, or aircraft executing practice instrument approaches at the airport.

Medium-Intensity Approach Lighting (MALSR) -This system includes runway alignment indicator lights. An airport lighting facility which provides visual guidance to landing aircraft.

Microwave Landing System (MLS) - An instrument landing system operating in the microwave spectrum which provides lateral and vertical guidance to aircraft with compatible equipment.

Minimums - Weather condition requirements established for a particular operation or type of operation.

Movement Area - The runways, taxiways and other areas of the airport used for taxiing, takeoff and landing of aircraft, exclusive of loading ramps and parking areas.

Navigational Aid (NAVAID) - Any visual or electronic device airborne or on the surface which provides point to point guidance information or position data to aircraft in flight.

Non-Directional Beacon (NDB) - Transmits a signal on which a pilot may "home" using equipment installed in the aircraft.

Non precision Instrument Approach - An instrument approach procedure with only horizontal guidance or area-type navigational guidance for straight-in approaches.

Object Free Area (OFA) - A two dimensional ground area surrounding runways, taxiways, and taxilanes which is clear of objects except those whose location is fixed by function.

Object Free Zone (OFZ) - The airspace defined by the runway OFZ and, as appropriate, the inner- approach OFZ and the inner-transitional OFZ, which is clear of object penetrations other than frangible NAVAIDS.

Runway OFZ - The airspace above a surface centered runway centerline.

Inner-approach OFZ - The airspace above a surface centered on the extended runway centerline. It applies to runways with an approach lighting system.

Inner-transitional OFZ - The airspace above the surfaces located on the outer edges of the runway OFZ and the inner-approach OFZ. It applies to precision instrument runways.

Obstruction - An object which penetrates an imaginary surface described in FAR Part 77.

Peaking Factor - The factor applied to the annual operations to determine the peak hour activity.

Precision Approach Path Indicator (PAPI) - Provides visual approach slope guidance to aircraft during approach to landing by radiating a directional pattern of high intensity focused light beams.

Precision Instrument Approach - An instrument approach procedure in which electronic vertical and horizontal guidance is provided, e.g. ILS and MLS.

Primary Surface - A surface longitudinally centered on the runway, extending 200 feet beyond each end of the runway. The elevation of any point on the primary surface is the same as the elevation of the nearest point on the runway centerline.

Rotorcraft (e.g. Helicopter) - A heavier-than-air aircraft supported in flight by the reactions of the air on one or more power-driven rotors on substantially vertical axis.

Runway End Identifier Lights (REIL) - These lights aid in early identification of the approach end of the runway.

Runway Protection Zone (RPZ) - The ground area under the approach surface which extends from the primary surface to a point where the approach surface is fifty feet above the ground. This was formerly known as the clear zone.

Runway Safety Area (RSA) - A defined surface surrounding the runway prepared or suitable for reducing the risk of damage to airplanes in the event of an undershoot, overshoot, or excursion from the runway.

Segmented Circle - A system of visual indicators designed to provide traffic pattern information at airports without operating control towers.

Touch and Go Operation - Practice flight performed by a landing touch down and continuous take off without stopping or exiting the runway.

Transitional Surfaces - These surfaces extend outward and upward at right angles to the runway centerline and the extended runway centerline at a slope of 7:1 from the sides of the primary surface and from the sides of the approach surfaces. Transitional surfaces for those portions of a precision approach surface which project through and beyond the limits of the conical surface extend a distance of 5,000 feet measured horizontally from the edge of the approach surface and at right angles to the runway centerline.

Transport Airport - An airport designed, constructed and maintained to serve airplanes in aircraft approach category C and D.

Utility Airport - An airport designed, constructed and maintained to serve airplanes in aircraft approach category A and B.

Visual Flight Rules (VFR) - Flight rules by which aircraft are operated by visual reference to the ground. Weather conditions for flying under these rules must include a ceiling greater than 1,000 feet, three-miles visibility and standard cloud clearance.

Wind Coverage - Wind coverage is the percent of time for which aeronautical operations are considered safe due to acceptable crosswind components.

Wind Rose - A scaled graphical presentation of wind information.

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APPENDIX E: BIBLIOGRAPHY

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