Washington State
Department of Transportation

Washington State
Long-Term Air Transportation Study

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Washington Aviation System Plan

Summary Report

March 3, 2009

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

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The report was developed through a joint effort with the Washington State Department of Transportation (WSDOT Aviation) and the SH&E study team, which included Simat, Helliesen & Eichner, Inc. (SH&E), W&H Pacific, URS Corp., PRR, and Cambridge Systematics, Inc. (CSI).

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SUMMARY REPORT

The dynamic Washington public airport system represents an essential element of the state transportation system and provides critical support to the Washington economy

Washington's 138 public-use airports represent an essential element of the State transportation system and provide critical support to the State economy. The importance of air transportation in Washington is accentuated by the State's unique geographic and topographical features, which produce an unusually high reliance on aviation, not only for intercity transport of people and cargo, but also for firefighting, medical evacuation, and other emergency services. Washington's airports span a broad range in terms of scale and role, from Seattle-Tacoma International Airport—the nation's 18th busiest commercial airport—down to 39 remote or recreational airports, many served only by turf runways. The Division of Aviation of the Washington State Department of Transportation has undertaken this air transportation system plan to ensure that the State's system of public-use airports receives the care and funding that is required to effectively serve the needs of Washington residents, businesses and visitors, well into the future.

Here are some quick facts about aviation in Washington:

- Over 17 million scheduled passengers depart from Washington airports every year
- About 3.7 million aircraft landings/departures occur every year
- More than 600,000 tons of air cargo flow through the state's airports annually
- Statewide commercial and general aviation activity together generate approximately 171,000 jobs, $4.1 million in wages, and $18.6 billion in total output[1]

A long-term statewide plan is needed to account for significant population growth and to address a variety of challenges expected over the next 25 years

In order to continue to meet air transportation needs in the state, Washington's airport system must be maintained and improved under a coherent statewide plan. Significant challenges that face the state's aviation system in the next 25 years include:

- Population in Washington has doubled in the last 30 years and will increase by an additional 2.5 million or 40 percent by 2030.
- Limited funding

[1] Washington State Department of Transportation, Aviation Division: Aviation System Plan – Forecast and Economic Analysis Study, 2001.

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- Concentration of aviation activity in key regions of the state
- Local land use conflicts
- Uncertain economic conditions

All these factors underscore the importance of long range aviation planning in Washington.

Washington State Long-Term Air Transportation Study (LATS)

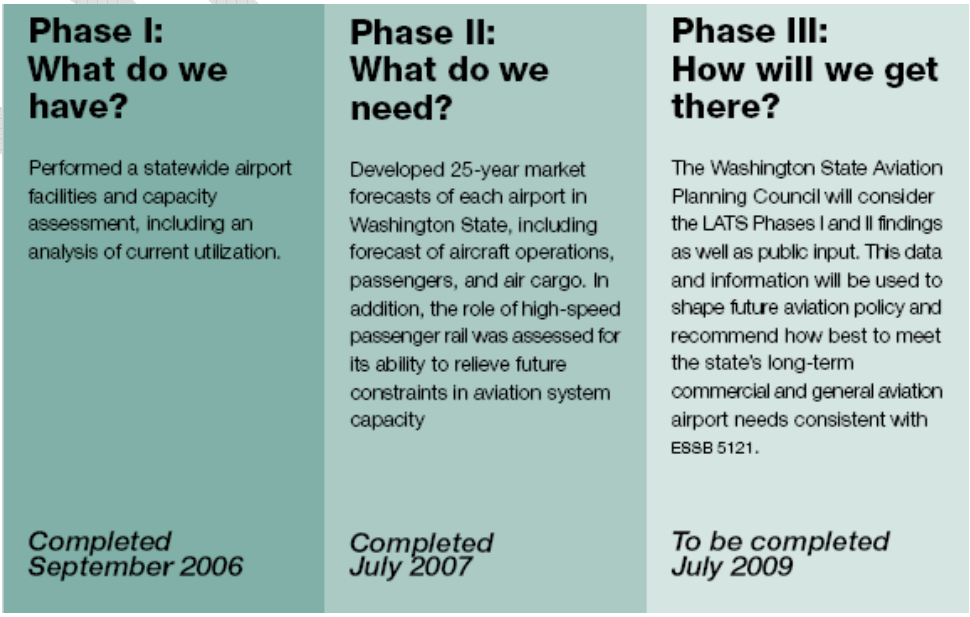
The Washington State Long-Term Air Transportation Study (LATS) was authorized in 2005

In 2005, the Governor authorized the Washington State Long-Term Air Transportation Study (LATS) through Engrossed Substitute Senate Bill (ESSB) 5121. This legislation directed the Washington State Department of Transportation (WSDOT) Aviation to assess existing statewide aviation capacity and implement a plan to address Washington's future air transportation needs.

The bill authorized a long-term planning study for general aviation and commercial airports in Washington State, with primary focus on commercial aviation as well as on four Special Emphasis Regions identified in the legislation – Puget Sound, Southwest Washington, Spokane, and Tri-Cities.

The study was developed in three phases, as shown in Figure 1.

Figure 1: The Three Phases of LATS



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LATS findings and recommendations will be integrated into the Washington Transportation Plan (WTP), the Federal Aviation Administration (FAA) National Plan of Integrated Airport Systems (NPIAS), and regional and local transportation plans.

Aviation Planning Council

An Aviation Planning Council was appointed to develop recommendations based on LATS findings

Pursuant to ESSB 5121, a ten-member Washington State Aviation Planning Council was appointed in Phase III of LATS to develop recommendations for the state air transport system based on LATS findings. The Aviation Planning Council was comprised of representatives from varying geographical areas with diverse aviation-related backgrounds. The Council was formed to:

- Make recommendations based on LATS I and II findings regarding how best to meet statewide commercial and general aviation capacity needs;
- Determine which regions of the state are in need of improvement regarding the matching of existing or projected airport facilities and the long-range capacity needs within the region;
- Make recommendations regarding the placement of future commercial and general aviation airport facilities to meet future aviation needs;
- Include public input in making final recommendations.

This system plan presents the findings and recommendations from LATS. This plan represents the first comprehensive airport system planning effort in Washington State in over 20 years. The plan addresses the issues raised in ESSB 5121 and is consistent with Federal Aviation Regulations (FAR) Advisory Circular (AC) 150/5070-7 "The Airport System Planning Process."

System Plan Components

The system plan considers a variety of technical tasks and analyses completed in LATS

The system plan considers a variety of technical tasks and analyses conducted throughout LATS. As depicted in Figure 2, findings from analyses culminate in the development of recommendations for the Washington State aviation system.

The technical tasks completed in LATS include:

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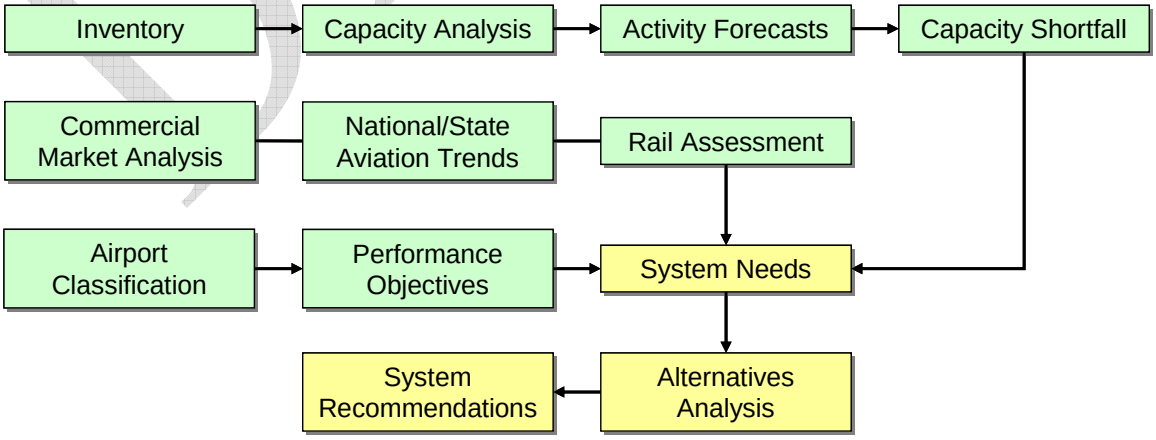
- Inventory of existing facilities and activity at Washington public airports
- Capacity analysis and airspace assessment for Washington public airports
- Review of national and state aviation trends
- Market analyses for Washington's commercial airports
- Development of a State Airport Classification System, and the establishment of measurable performance objectives for each airport class
- Forecasts of future aviation activity in Washington, including airline passenger traffic, general aviation activity, and air cargo
- Determination of future capacity shortfalls at the individual airport and regional levels
- Analysis of capacity and demand in the four Special Emphasis Regions across the state
- High-speed rail service assessment to determine whether proposed rail improvements will alleviate capacity constraints in the aviation system
- Identification and evaluation of alternative strategies that address the long-term needs of the Washington aviation system

Figure 2: The Washington Aviation System Plan Components



Special Emphasis Regions

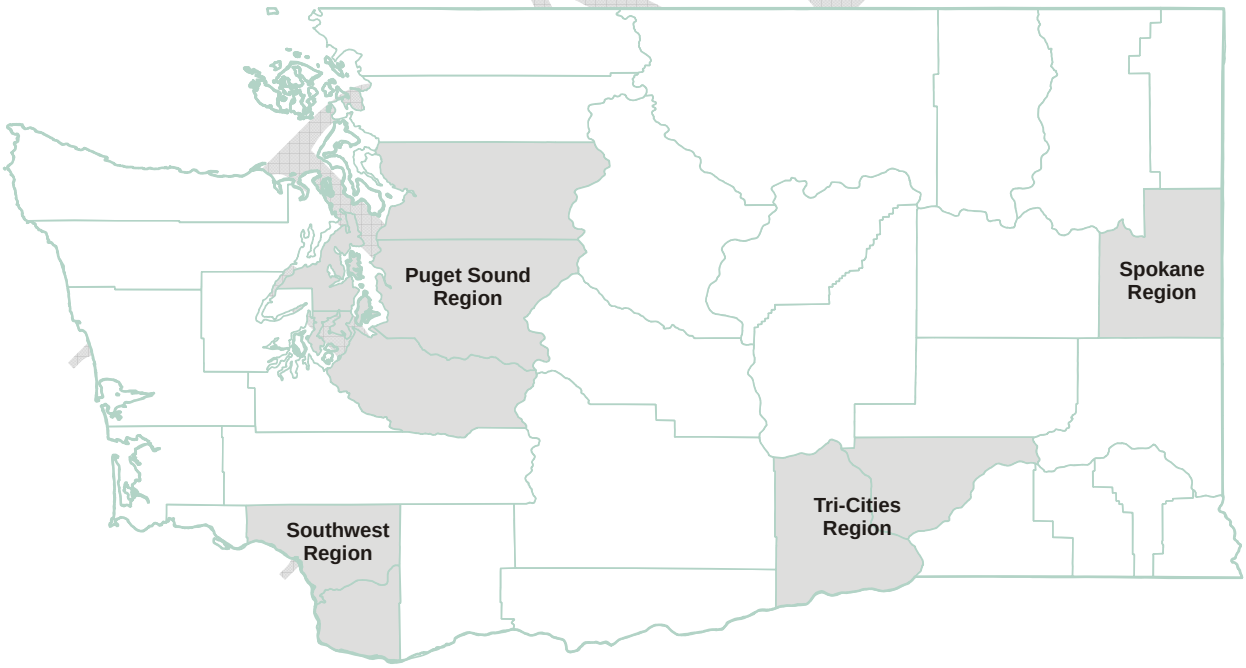
The four Special Emphasis Regions are key centers of population, employment and economic activity in the state

The Washington State Legislature specifically designated four geographic regions for special attention in this study because they constitute key centers of population, employment and economic activity. Activity within these regions is considered to be vital to the health of the state economy. The four designated Special Emphasis Regions are:

1. **Puget Sound:** consisting of King, Snohomish, Pierce, and Kitsap Counties
2. **Southwest Washington:** consisting of Clark and Cowlitz Counties
3. **Spokane:** consisting of Spokane County
4. **Tri-Cities**: consisting of Benton and Franklin Counties

Figure 3 below shows the location of the four Special Emphasis Regions.

Figure 3: Washington State Special Emphasis Regions



Public Participation

Public participation was a central part of the study process

Public participation has been an important part of LATS. Throughout the study, outreach activities have been conducted in order to inform the public of LATS findings and progress, and to elicit invaluable public input. Public outreach initiatives included the following:

- A series of Regional Public Meetings conducted across the state during each phase of LATS
- Two Electronic Town Halls – August 2008 and November 2008
- Online Survey – March 2009
- Briefings to government entities and other organizations throughout LATS
- A series of quarterly E-Newsletters
- Aviation Planning Council Meetings/Workshops – 10 meetings throughout the project
- The LATS project website – http://www.wsdot.wa.gov/Aviation/lats

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Washington Public Airport Classification System

Washington has a system of 138 public airports, ranging from small general aviation facilities to the state's primary commercial airport Sea-Tac

Washington State currently has 138 airports open for public use. Washington public airports range from small general aviation facilities – home to a handful of piston aircraft – to the state's primary commercial airport, Seattle-Tacoma International – which ranked 18th in the nation in terms of passenger volume in 2007. Sixty-five state airports are identified as significant to the national airport system by the FAA and included in the FAA's National Plan of Integrated Airports (NPIAS). These airports are eligible to receive federal funding through the FAA Airports Improvement Program (AIP).

Within the state system, individual airports contribute at varying levels and serve different roles in meeting statewide air transportation demand.

A state airport classification system was developed to identify the role of each airport in the state system

LATS established a state airport classification system to identify the role of each airport in the system and determine the types of facilities and services necessary at each. Factors considered in determining airport classifications include runway length, based aircraft, economic impact, population served, and service area driving time.

Six classifications are used in the Washington State airport classification system:

- Commercial Service Airports
- Regional Service Airports
- Community Service Airports
- Local Service Airports
- Recreation or Remote Airports
- Seaplane Bases

Figure 4 shows the distribution of Washington's public use airports among the six classifications and lists the threshold criteria associated with each role.

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Figure 4: Distribution of Airports by Classification

Classification	No. of Airports	Description
Commercial Service	16	Accommodates at least 2,500 scheduled passenger boardings per year for at least three years.
Regional Service	19	Serves large or multiple communities; all NPIAS Relievers; 40 or more based aircraft and 4,000-foot long runway, with exceptions
Community Service	23	Serves a community; at least 20 based aircraft; paved runway
Local Service	33	Serves a community; fewer than 20 based aircraft; paved runway
Recreation or Remote	39	Other land-based airports, including residential airparks
Seaplane Bases	9	Identified by FAA as a seaplane base, unless it is a Commercial Service Airport

Commercial Service and Regional Service airports accommodate high levels of activity and typically handle high performance aircraft such as jets

The first two classifications, Commercial Service Airports and Regional Service Airports, have the largest service areas, in terms of driving time and population. Airports in both classifications accommodate high levels of activity and are typically capable of handling high performance aircraft such as regional/corporate jets and turboprops.[2] Their ability to accommodate jet traffic makes them vital assets for regional economic development and quality of life.

Most Regional Service airports can accept emergency passenger and cargo flights in large aircraft[3], should Commercial Service Airports or ground transportation modes be incapacitated by natural or manmade disaster. In addition, Regional Service Airports include the facilities most likely to grow into new Commercial Service Airports in the future. WSDOT's goal for providing access to Regional Service Airports is that nearly every Washington resident should be able to reach a "jet-capable" Regional Service or comparable Commercial Service Airport within 90 minutes.

This principle recognizes that most of the Commercial Service Airports in Washington also have the capacity for and provide the

[2] ,This capability is not present at certain Reliever airports that are designed for small aircraft.
[3] Aircraft with maximum takeoff weight over 12,500 pounds

facilities and services needed for high levels of general aviation activity and for jet aircraft.

Community Service and Local Service Airports serve small to medium-sized communities

The Community Service and Local Service Airports serve small-to medium-sized communities. An airport in one of these two classifications accommodates a fairly wide range of general aviation activities such as agriculture interests, business support and emergency medical transportation that are important to the community's economic well-being and quality of life.

Recreation or Remote Airports and Seaplane Bases serve narrower scopes of general aviation

The Recreation or Remote Airports and Seaplane Bases serve narrower scopes of general aviation. An airport in one of these two classifications typically owes its existence to geographic circumstances (e.g., a residential airpark, recreational destination, body of water, or fire fighting / emergency landing area in the mountains), rather than to demand from the population within its service area.

Some of the Recreation or Remote Airports are very busy airparks. Nevertheless, the presence of residential uses close to the runway may pose a challenge for airport operations. Residential land uses are generally considered incompatible land uses when located adjacent to airports because airport operations create noise, vibrations and other effects that affect quality of life. While residents of airpark communities are typically aircraft owners, properties could eventually be sold to persons who do not own aircraft or are not aviation enthusiasts, which could affect the long-term viability of the airport. For this reason, their role in providing transportation access in the state system is limited.

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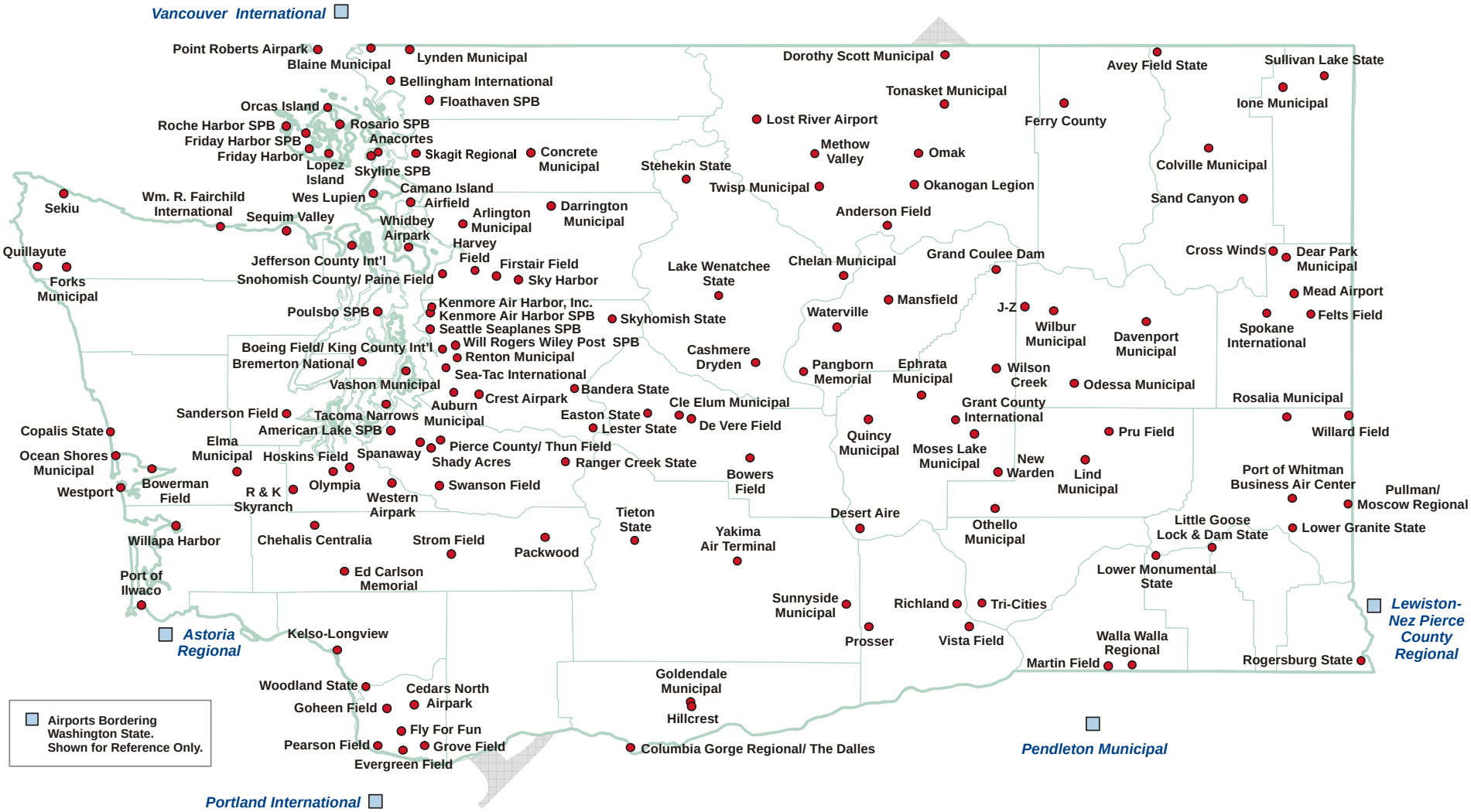
Figure 5: Washington State Public Use Airports System



Washington Public Airport Performance Objectives

Performance objectives were developed to set targets for airport facilities, services and operational capabilities for each airport classification level

Performance objectives targeting airport facilities, services and operational capabilities were developed for each class of airports during LATS. While the classification system assigns airports based on their function and role, the performance objectives establish measurable goals for each airport classification level within Washington's air transportation system.

Two types of performance objectives are proposed: 1) those that relate to all classifications, and 2) those that are customized for the facilities and services appropriate to each classification. The Commercial Service and Regional Service Airports have the same facility and service objectives because of the similarity of baseline needs for commercial passenger jets and corporate jets. In addition, it is possible that some airports will move between the two classifications, as airline service starts and stops and as the number of annual passenger boardings fluctuates above and below 2,500.

Performance objectives for Community Service Airports are focused on accommodating a variety of general aviation aircraft, air taxi operations, and potential operations in very light jets (VLJ). Local Service Airports have facility and service objectives geared to small piston general aviation and visual operations.

Recreation or Remote Airports and Seaplane Bases have no service objectives and few facility objectives, reflecting the lower level of facilities and services needed at these airports, compared to the other classifications.

Figure 6 summarizes the performance objectives and indicates their applicability to the various state classifications. Proposed performance objectives in the areas of operational factors, up-to-date plans and land use compatibility protection are applicable to all public airports in the state. Performance objectives related to airport facilities and services are tailored to the various airport classifications.

The performance objectives provide a means to evaluate facilities, services, and other important factors for each type of airport in the

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state system. Assessing if individual airports meet their appropriate performance objectives helps to identify improvements needed for enhancing the statewide airport system.

Figure 6: Performance Objectives and Their Applicability to Airport Classifications

	Objective	Com-mercial Service	Regional Service	Community Service	Local Service	Recreation or Remote	Seaplane Base
Operational Factors	Standard runway safety area	X	x	X	x	x	NA
	Runway PCI 75	X	x	X	x	x	NA
	Taxiway PCI 70	X	x	X	x	x	NA
	Apron PCI 70	X	x	X	x	x	NA
	No obstacles in threshold siting surface	X	x	X	x	x	X
	No obstacles in obstacle free zone	X	x	X	x	x	X
Plan	Planning documents less than 7 years old	X	x	x	x	x	X
Land Use Compatibility Protection	Compatibility policies in comprehensive plan	X	x	x	x	x	X
	Appropriate zoning designation for airport	X	x	x	x	x	X
	Land use controlled in runway protection zones	X	x	x	x	x	X
	Height hazard zoning or regulations	X	x	x	x	x	X
	Zoning discourages incompatible development	X	x	x	x	x	X
Facilities	Runway Length	5,000 feet	5,000 feet	3,200 feet	2,400 feet	No objective	No objective
	Taxiway	Parallel	Parallel	Parallel	Turn-around	Turn-around	No objective
	Instrument Approach	Lower than ¾ mile visibility minimum	Lower than ¾ mile visibility minimum	1 mile visibility minimum	No objective	No objective	No objective
	Lighting	Medium	Medium	Medium	Low	Reflectors	NA
	Visual Glide Slope Indicators	X	x	x	x	No objective	NA
	Weather Reporting	AWOS or ASOS	AWOS or ASOS	Super-Unicom	No objective	No objective	No objective
Services	Dock Facility	NA	NA	NA	NA	NA	Yes
	Fuel Sales	Jet A and 100LL	Jet A and 100LL	100LL	No objective	No objective	No objective
	Maintenance Service	Major	Major	Minor	No objective	No objective	No objective

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Achievement of Performance Objectives

Washington's airports vary in their ability to meet the established performance objectives

Washington's airports vary in their ability to meet the established performance objectives. As might be expected, Washington's Commercial Service airports are better at meeting performance objectives than the other airport classifications. However, addressing deficiencies at the Commercial Service airports will be much more costly than for any other classification. Considered on a statewide basis, the system performs best with regard to runway, taxiway, and apron pavement condition. This performance reflects past federal and state investments in pavement preservation. On the other hand, all airport classifications need improvement in meeting objectives for land use compatibility protection.

Some key challenges to be addressed include the following:

- Only 63 percent of Commercial Service airports meet the objective to have a precision instrument approach, which is a fundamental need for airline service.
- Only 37 percent of Regional Service airports have a precision instrument approach and only 68 percent have a runway at least 5,000 feet long, both factors important for the airports to be "jet capable." The accommodation of jet traffic is important to Regional Service Airports in order to serve corporate aviation, support disaster relief, and possibly accommodate future airline service.
- The Community Service airports are less than 50 percent compliant with the objectives for a nonprecision instrument approach, standard runway safety area, and weather reporting. These deficiencies hurt the all-weather capability of Community Service airports, which are relied on by small and medium sized communities for medevac.
- Local Service airports' main deficiencies are standard runway safety area and vertical glide slope indicators—both safety-critical needs.

Results from the performance assessment are displayed in Figures 7 to 12. The figures show the percent of airports within each airport class that meet the established performance objectives.

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Figure 7: **Commercial Service Airports Performance Assessment**

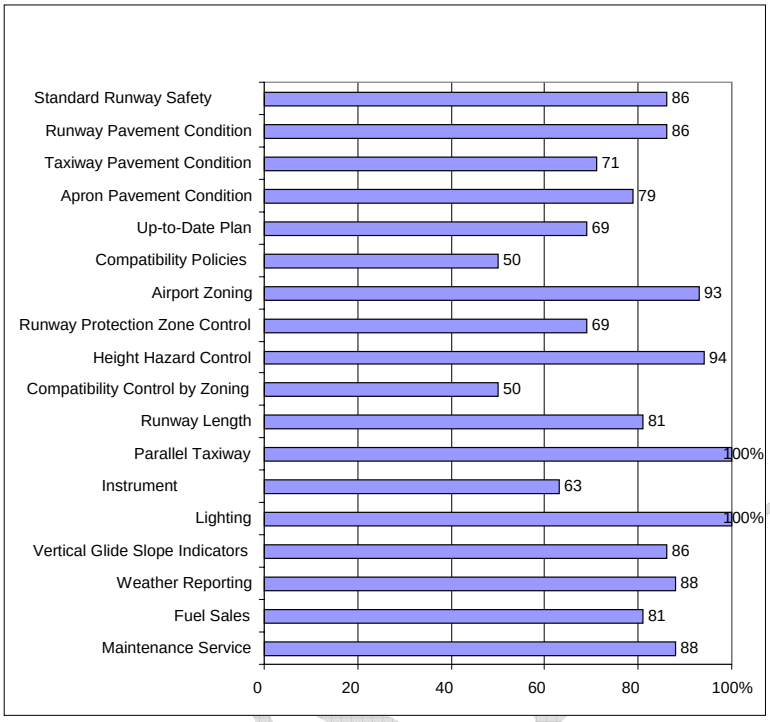


Figure 8: **Regional Service Airports Performance Assessment**

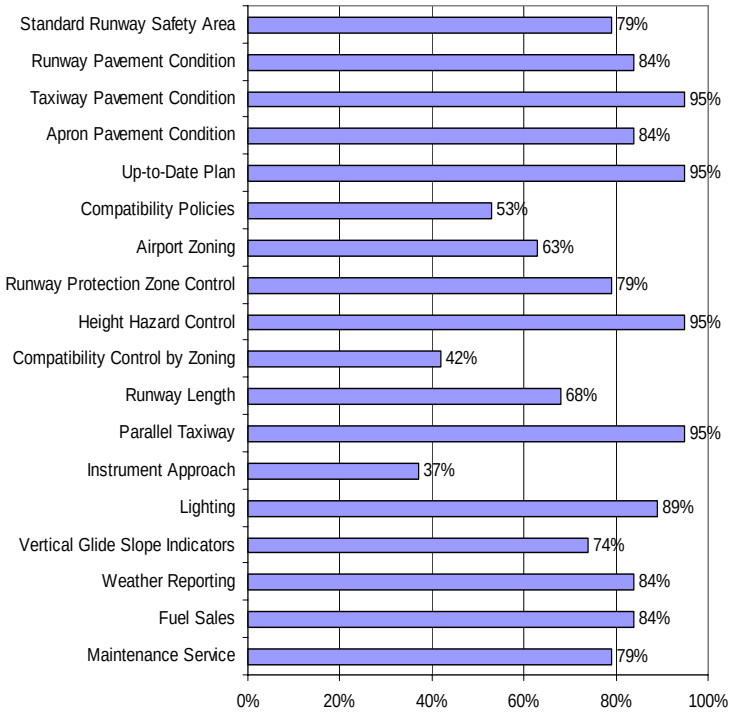


Figure 9: **Community Service Airports Performance Assessment**

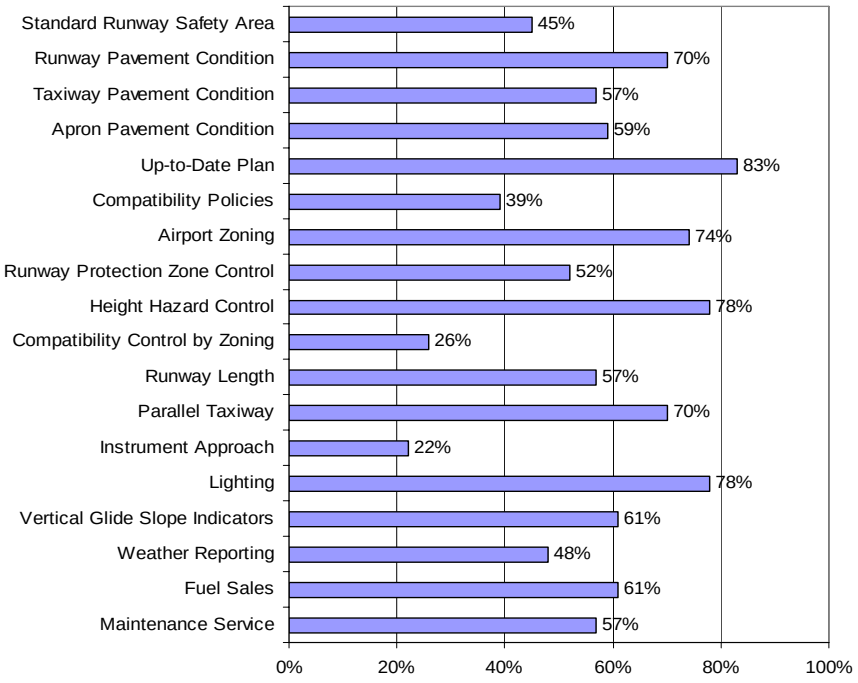


Figure 10: **Local Service Airports Performance Assessment**

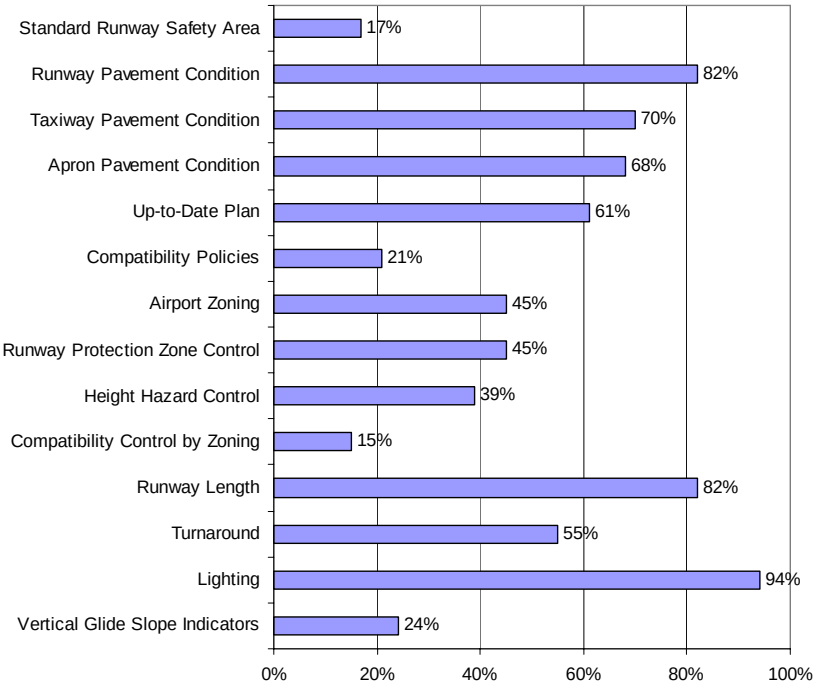


Figure 11: **Recreation or Remote Airports Performance Assessment**

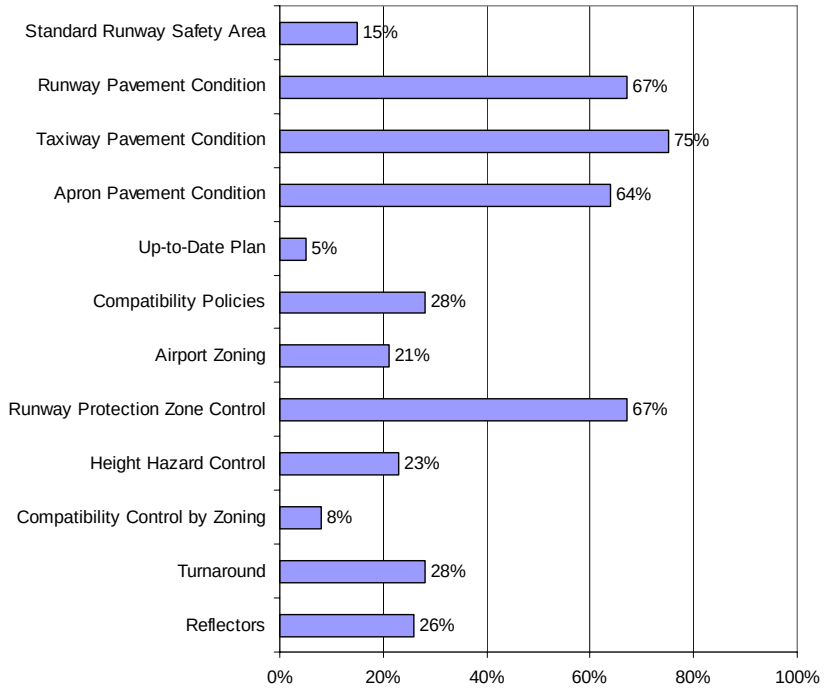
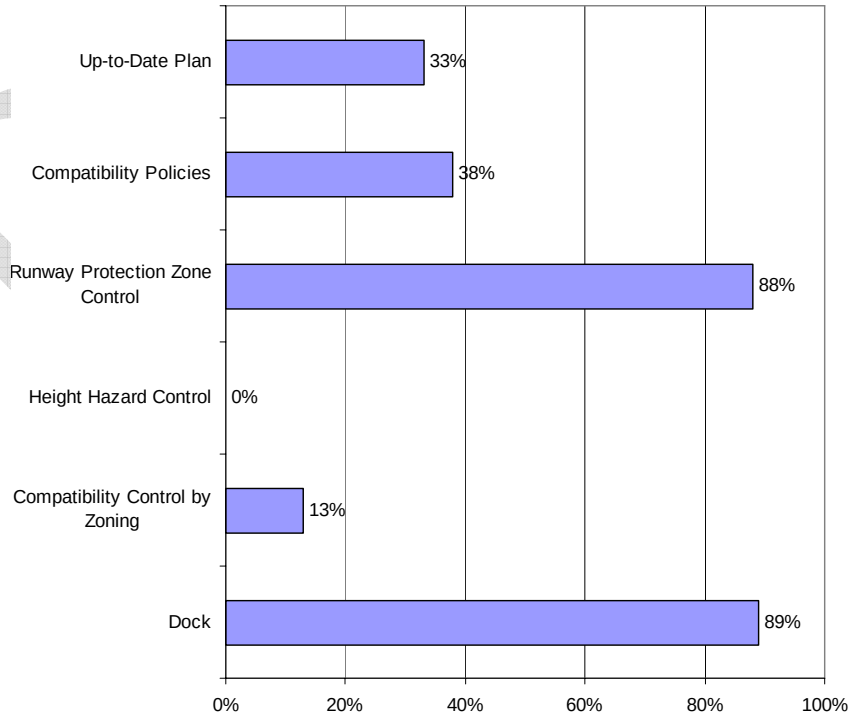


Figure 12: **Seaplane Bases Performance Assessment**



State Aviation Forecasts

Forecasts were developed to identify future demand in commercial passenger traffic, GA activity, and air cargo activity

Forecasting future aviation demand is critical to long range facility planning for the state. In LATS, forecasts of future activity at public use airports across Washington State were developed. The forecasts identify expected demand in commercial passenger traffic, general aviation activity, and air cargo activity in Washington through 2030. Forecast results are summarized below.

- Between 2005 and 2030, passenger enplanements at Washington State's airports are forecast to increase by 85 percent, from 17 million to 31 million -- or 2.5 percent per year on average.
- Passenger traffic in Washington State is projected to remain highly concentrated at Seattle-Tacoma International and Spokane International airports for the foreseeable future. The forecast projects that in 2030, Sea-Tac will still account for 85 percent of the state's total enplanements, and Spokane will account for an additional 11 percent.
- The state's commercial passenger aircraft operations are projected to increase at a healthy 2.1 percent per year, from 570,000 in 2005 to 960,000 by 2030. This represents a 69 percent increase in commercial operations between 2005 and 2030. Commercial operations are expected to grow more slowly than enplanements, as aircraft size, load factors and average passenger loads increase in the future in line with national trends.
- In 2005, approximately 8,100 general aviation aircraft were based at public use airports in Washington State. The number of statewide based aircraft is forecast to increase to approximately 9,700 aircraft in 2015, and 11,800 aircraft in 2030. From 2005 to 2030, the state's based aircraft will increase at an average annual rate of 1.5 percent. This tracks the national average closely.
- Washington State's general aviation aircraft operations are forecast to increase from 3.0 million in 2005 up to 4.4 million in 2030, representing average annual growth of approximately 1.60 percent. The growth in GA operations is slightly higher than the growth in based GA aircraft, reflecting a small increase in the average number of operations per based aircraft.

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- Washington's total air cargo volume is expected to grow from approximately 600,000 tons in 2005 to 1,407,000 tons in 2030. This represents a significant 3.5 percent annual growth over the forecast period.

Ongoing Forecast Tracking

Uncertainty surrounding long-term forecasts will be accounted for through ongoing forecast tracking

There is always uncertainty surrounding long-term forecasts of aviation activity, and the current economic climate clearly introduces the possibility that various segments of the aviation market in Washington State, and across the country, may grow more slowly than forecast. To address this issue, the State is implementing a forecast tracking system to determine on an ongoing basis how actual levels of aviation activity compare with the LATS forecasts. Should it become apparent that the actual levels of commercial, general aviation, and air cargo traffic are substantially different from the forecasts, the State will adjust the timing of the projections to more accurately reflect the observed trends. In this way, the system planning process will be continuously informed by the most recent available information.

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Capacity Analysis

Existing capacity in the state was compared to expected future activity to identify potential capacity shortfall

The capacity analysis measures the ability of existing airport facilities and components to accommodate existing and expected future activity. A comparison of existing capacity at Washington airports with forecast activity levels identifies potential capacity constraints or shortfalls across the state.

The capacity analysis in LATS examined five elements of aviation system capacity:

- **Airfield Capacity:** the ability of an airport's runway system to accommodate take-offs and landings without experiencing delays.
- **Commercial Airline Passengers:** the ability of an airport terminal to accommodate airline passengers with adequate space for ticketing, security, and other facilities.
- **Air Cargo:** the ability of an airport to accommodate processing of air cargo tonnage using existing facilities.
- **Aircraft Storage and Parking:** the ability of an airport to accommodate storage of based and transient aircraft in tie-downs and hangars.
- **Airspace System:** the ability of available airspace to safely accommodate aircraft in transit between airports.

A number of Washington airports are expected to experience either airfield, passenger terminal, or aircraft storage constraints by 2030

A number of airports across Washington are expected to experience either airfield, passenger terminal, or aircraft storage capacity constraints by 2030. These airports are shown in Figure 13 and discussed in the capacity findings that follow.

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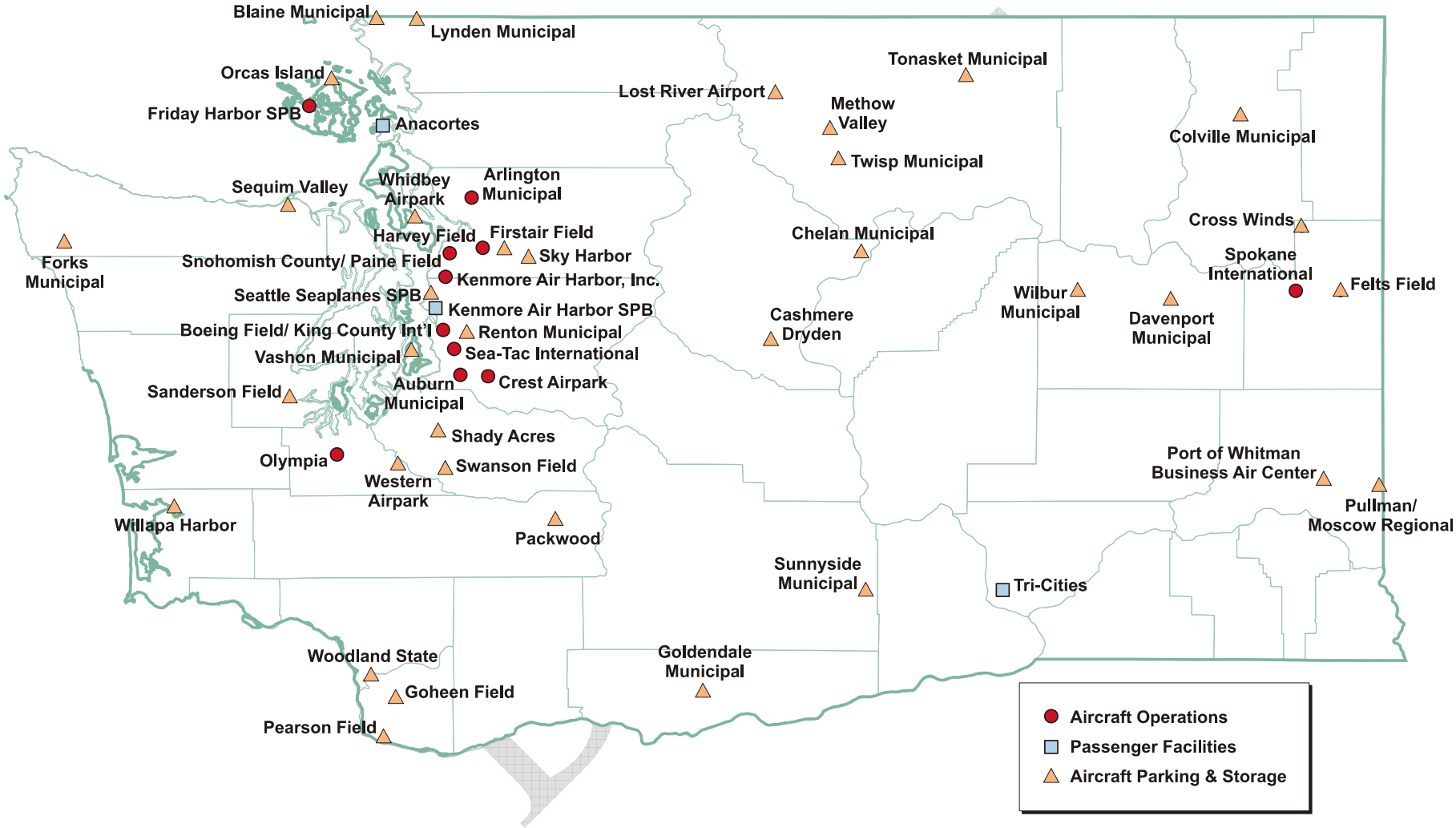
Figure 13: Washington Airports Expected to Experience Capacity Constraints by 2030



Note: Seattle-Tacoma International and Kenmore Air Harbor Inc. are also expected to experience constraints in both Passenger Facilities and Aircraft Storage. Boeing Field, Crest Airpark and Orcas Island are also expected to experience constraints in Aircraft Storage.

Airfield Capacity

The airfield capacity (or operations capacity) of an airport measures the number of aircraft operations that can be accommodated by the airport's runway/taxiway system without incurring unacceptable levels of congestion and delay. Key findings of the airfield capacity analysis are described below.

- Existing and future levels of aircraft operations activity on a statewide basis are well below the capacity of the aviation system as a whole. However, aircraft operations are not uniformly distributed among Washington State airports. Much of the available capacity is not placed strategically to serve expected demand.
    - In 2005, total aircraft operations in Washington utilized less than 15 percent of overall system operations capacity at the state level. Aircraft demand is expected to only increase from 14.6 percent of capacity in 2005 to 22.5 percent of total system capacity in 2030.
    - The primary capacity issue is the distribution or concentration of demand in the most populated regions of the state, particularly in the Puget Sound Region. Airports located in and around the major population and economic centers of the state experience the greatest demand.
    - The smaller, outlying airports in Washington provide over 60 percent of the state's operations capacity, but only generate about 25 percent of statewide activity. The largest airports provide only one-third of total operations capacity but attract 75 percent of the demand.

- Airfield capacity constraints (or the inability of an airport's runway system to accommodate forecast flight activity) are expected to emerge at twelve airports.

Four airports – all located within the Puget Sound Region – are expected to exceed their operational capacity by 2030

    - Four Washington airports are anticipated to exceed 100 percent of their operating capacity by 2030. The four airports are all located within the Puget Sound Special Emphasis Area and include:
        - Seattle-Tacoma International

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- Boeing Field
- Harvey Field
- Kenmore Air Harbor Inc.

Eight additional airports are expected to reach 60% capacity and will need to initiate planning for adding capacity

- Eight additional airports in Washington were identified as exceeding the 60 percent capacity planning threshold – the activity level at which planning should commence for adding capacity – by 2030. These airports include:
  - Arlington Municipal
  - Auburn Municipal
  - Snohomish County/Paine Field
  - Crest Airpark
  - Friday Harbor
  - Kenmore Air Harbor SPB
  - Spokane International
  - Olympia

- Among the airports expected to experience capacity constraints are several that would be likely to have statewide impact (Seattle-Tacoma International, Boeing Field/King County International and Spokane International).
- In regards to Seattle-Tacoma International, recent trends including higher passenger load factors and an "upgauging" of aircraft size indicate that the airport may now reach its capacity limits beyond 2030. Nevertheless, the airport is still expected to be approaching its capacity limits during the study timeframe, and strategies need to be developed to accommodate future growth in underlying demand.

Significant constraints are anticipated in the Puget Sound Region

- The concentration of operations activity within the Puget Sound area results in significant constraints in the region.
  - In 2005, ten of the 20 busiest airports in Washington State were located within the Puget Sound boundary. These airports accommodated approximately 50 percent of total operations statewide.
  - In 2005, operations at six Washington airports exceeded the FAA's 60 percent threshold for

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planning additional capacity. All six airports are located within the Puget Sound Special Emphasis Region.

- Nine airports within the Puget Sound Special Emphasis Area are expected to exceed or approach their operations capacity by 2030.
- The large number of Puget Sound airports anticipated to experience capacity constraints limits the options for managing demand within the region. Methods such as traffic redistribution or demand management are more difficult when all system airports are nearing capacity.

Tables 1 and 2 below summarize the aircraft operations forecast and Airport Service Volume (ASV) or available operational capacity at each of the twelve constrained airports.

Table 1: Airports Exceeding 100 Percent of Operations Capacity by 2030

	ASV	2005	2010	2015	2020	2025	2030
Commercial Service Airports							
Boeing Field/King County Int'l	380,000	251,856	305,209	368,356	423,083	482,822	549,181
Percent Capacity		66%	80%	97%	111%	127%	145%
Operations Over 100% Capacity					43,083	102,822	169,181
Seattle-Tacoma International	533,041	346,744	391,960	443,068	499,673	563,563	633,599
Percent Capacity		65%	74%	83%	94%	106%	119%
Operations Over 100% Capacity						30,522	100,558
Regional Service							
Harvey Field	230,000	139,160	156,790	173,950	193,091	214,556	237,636
Percent Capacity		61%	68%	76%	84%	93%	103%
Operations Over 100% Capacity							7,636
Commercial Service/Seaplane Base							
Kenmore Air Harbor, Inc.	56,250	57,000	65,950	71,250	75,150	78,950	83,300
Percent Capacity		101%	117%	127%	134%	140%	148%
Operations Over 100% Capacity		750	9,700	15,000	18,900	22,700	27,050

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Table 2: Airports at 60 Percent Capacity by 2030

	ASV	2005	2010	2015	2020	2025	2030
Commercial Service							
Friday Harbor	138,000	65,457	70,941	76,931	83,462	90,643	98,450
Percent Capacity		47%	51%	56%	60%	66%	71%
Reserve Operations		72,543	67,059	61,069	54,538	47,357	39,550
Spokane International	215,000	91,354	101,837	115,397	128,004	139,691	151,298
Percent Capacity		42%	47%	54%	60%	65%	70%
Reserve Operations Capacity		123,646	113,163	99,603	86,996	75,309	63,702
Regional Service							
Arlington Municipal	270,000	148,540	164,855	183,178	197,261	211,853	227,208
Percent Capacity		55%	61%	68%	73%	78%	84%
Reserve Operations Capacity		121,460	105,145	86,822	72,739	58,147	42,792
Auburn Municipal	231,000	143,450	150,063	155,872	160,888	165,126	169,949
Percent Capacity		62%	65%	67%	70%	71%	74%
Reserve Operations Capacity		87,550	80,937	75,128	70,112	65,874	61,051
Olympia	230,000	89,527	107,683	127,917	141,493	155,610	170,785
Percent Capacity		39%	47%	56%	62%	68%	74%
Reserve Operations		140,473	122,317	102,083	88,507	74,390	59,215
Snohomish Co./Paine Field	316,218	150,368	160,528	172,020	181,028	189,854	199,783
Percent Capacity		48%	51%	54%	57%	60%	63%
Reserve Operations Capacity		165,850	155,690	144,198	135,190	126,364	116,435
Recreation/Remote							
Crest Airpark	240,000	146,250	151,200	155,250	157,950	160,200	162,450
Percent Capacity		61%	63%	65%	66%	67%	68%
Reserve Operations Capacity		93,750	88,800	84,750	82,050	79,800	77,550
Seaplane Base							
Kenmore Air Harbor SPB	60,000	31,200	39,300	42,500	43,900	45,300	46,700
Percent Capacity		52%	66%	71%	73%	76%	78%
Reserve Operations Capacity		28,800	20,700	17,500	16,100	14,700	13,300

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Passenger Terminal Capacity

Passenger terminal capacity is a measure of how many passengers can be processed through an airport's terminal facilities during peak periods of activity while maintaining an acceptable level of customer service and convenience. The passenger terminal capacity findings for Washington State are summarized below.

Six airports are either currently or expected to exceed their peak hour passenger capacity by 2030 – expansions required at other airports not significant compared to Sea-Tac

- The analyses determined that six airports are expected to exceed their peak hour passenger capacity by 2030. The projected passenger terminal expansion requirements for these airports are presented in Table 3. The six airports include:
    - Anacortes
    - Kenmore Air Harbor, Inc.
    - Kenmore Air Harbor Seaplane Base
    - Orcas Island
    - Seattle-Tacoma International
    - Tri-Cities

Table 3: Passenger Terminal Expansion Requirements

Airport	2005 Terminal Peak Hr Capacity	2005		2030		
		Peak Hour Passengers	Capacity Utilization (%)	Peak Hour Passengers	Capacity Utilization (%)	Add'l Terminal Area Required (sq. ft.)
Anacortes	9	9	100%	32	350%	4,025
Kenmore Air Harbor, Inc.	8	8	100%	13	161%	875
Kenmore Air Harbor SPB	8	8	100%	13	161%	875
Orcas Island	7	7	100%	11	153%	700
Seattle-Tacoma Int'l	8,065	4,800	68%	10,274	127%	386,575
Tri-Cities	271	185	68%	313	115%	7,350

- With the exception of Seattle-Tacoma International, the passenger terminal expansions required at those airports exceeding their 2030 peak hour passenger capacities are not significant and it is assumed that the required expansion can be accommodated within the existing airport footprint.

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- By 2030, four additional airports are forecast to exceed the 60 percent threshold at which planning for terminal expansion should begin. These airports include:
    - Pangborn Memorial
    - Friday Harbor
    - Pullman/Moscow Regional
    - Spokane International

Bellingham is also operating above its terminal capacity due to recent service increases

- Bellingham International is operating above its capacity due to recent service increases that have occurred since 2006.
    - The LATS forecast base year, 2005, preceded Bellingham's rapid passenger growth in 2006 and 2007. The LATS capacity analysis therefore does not identify Bellingham as reaching terminal capacity.
    - Studies done by the Port of Bellingham to address this issue, however, have revealed that the airport will need passenger terminal expansion by 2009.

Aircraft Storage Capacity

There were approximately 8,000 general aviation aircraft based in Washington State in 2005. In order to facilitate access and efficient use of the aviation system, these aircraft must be stored in locations that are both safe and convenient when the aircraft are not in use. This requires aircraft storage facilities at airports across the state. There are generally two types of aircraft storage – tiedowns and hangars. The aircraft storage capacity findings for Washington State are as follows.

- As of 2005, aircraft storage capacity in Washington State totaled 9,772 positions, of which 4,503 were aircraft tiedown positions, and 5,314 were hangar units. With 7,962 aircraft based in the state, the statewide airport system had reached 83 percent of its existing aircraft storage capacity.
- Aircraft parking and storage is generally constructed "on demand", such that tiedown positions and aircraft hangars are constructed only in response to visible demand.

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There are several individual airports throughout the state which are expected to have aircraft storage capacity shortfalls.

- As a whole, the Washington State airport system is expected to have adequate long-term aircraft storage capacity. The system is expected to be 29 percent utilized by 2015 and 36 percent utilized by 2030. However, there are many individual airports throughout the state which are expected to have aircraft storage capacity shortfalls.
- Approximately one-quarter (36 of 138) of Washington State airports are expected to experience aircraft storage constraints by 2030. These airports are listed by region in Table 4. The additional land area required to meet the 2030 storage demand is also indicated.

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Table 4: Airports Exceeding Aircraft Storage Capacity by 2030

	2030 Demand	2030 Capacity	2030 Utilization (%)	Add'l Land Needed to Meet Excess Demand (in Acres)[1]
North Central RTPO				
Cashmere Dryden	88	43	205%	3.8
Chelan Municipal	115	51	225%	5.3
Lost River Resort	3	1	300%	0.2
Methow Valley	20	19	105%	0.1
Tonasket Municipal	18	12	150%	0.5
Twisp Municipal	43	38	113%	0.4
Northeast Washington RTPO				
Colville Municipal	111	20	555%	4.2
Palouse RTPO				
Port of Whitman Bus. Air Center	105	11	955%	7.8
Pullman/Moscow Regional	105	94	112%	0.9
Peninsula RTPO				
Sanderson Field	219	21	1043%	18.3
Sequim Valley	41	35	117%	0.5
Forks Municipal	30	17	176%	1.1
Puget Sound Regional Council				
Boeing Field/King County Int'l	1,410	479	294%	75.6
Crest Airpark	451	325	139%	10.5
Firstair Field	105	87	121%	1.5
Kenmore Air Harbor Inc.	138	0		11.5
Renton Municipal	436	397	150%	3.3
Seattle-Tacoma International	15	4	375%	0.9
Seattle Seaplane Base	4	3	133%	0.1
Sky Harbor	5	0	--	0.4
Swanson Field	25	21	119%	0.3
Shady Acres	43	36	119%	0.6
Vashon Municipal	60	50	120%	0.8
Quad County RTPO				
Davenport Municipal	31	21	148%	0.8
Wilbur Municipal	23	20	115%	0.3
San Juan Islands				
Orcas Island	200	101	198%	8.3
Skagit/Island RTPO				
Whidbey Airpark	33	0	--	2.8
Southwest Washington RTC				
Goldendale Municipal	51	16	319%	2.9
Goheen Field	141	87	162%	4.5
Pearson Field	281	154	182%	10.6

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Figure 4: Airports Exceeding Aircraft Storage Capacity by 2030 (continued)

	2030 Demand	2030 Capacity	2030 Utilization (%)	Add'l Land Needed to Meet Excess Demand (in Acres) [1]
Southwest Washington RTPO				
Packwood	6	2	300%	0.3
Willapa Harbor	5	0	--	0.4
Woodland State	23	20	115%	0.3
Spokane RTC				
Cross Winds	3	2	150%	0.1
Felts Field	565	310	182%	21.3
Thurston RPC				
Western Airpark	79	0	--	6.6
Whatcom COG				
Blaine Municipal	49	35	140%	1.2
Lynden Municipal	49	15	327%	2.8
Yakima Valley COG				
Sunnyside Municipal	16	14	114%	0.2

Note: [1]Additional land area requirement calculated at the rate of 12 aircraft storage positions/acre.

Air Cargo Capacity in Washington State

Over 98 percent of statewide cargo tonnage is handled at three airports: Sea-Tac, Boeing Field, and Spokane

The air cargo analysis identified 15 Washington airports with some level of air cargo activity, although over 98 percent of statewide cargo tonnage was processed through three facilities: Seattle-Tacoma International, Boeing Field/King County International and Spokane International. Key findings concerning air cargo facilities in Washington State are presented below.

- Air cargo companies build facilities when they are needed.
- Facility expansion occurs as demand grows.
- Excess capacity seldom exists.
- Availability of aircraft parking apron is often the key determinant of an airport's ability to serve air cargo.
- Key factors influencing future growth are geographic location and apron/land availability.
- Availability of off-airport properties for cargo processing facilities provide a way around limitations on developable land at airports.

Additional airport-specific findings were developed for the top three cargo airports noted above.

Off-airport facilities may help to solve future limitations in available airport land at Sea-Tac and Boeing Field

- The analysis found that both Seattle-Tacoma International and Boeing Field/King County International are at or above 60 percent cargo capacity. The availability of off-airport cargo processing facilities may be an important determinant in the need for new or additional on-airport facilities.
- The analysis found no evidence of constraints to air cargo activity at other Washington system airports.
- A study of air cargo in the Puget Sound Region was completed by the Puget Sound Regional Council (PSRC) in 2006. The PSRC study addressed air cargo activity within the region and specifically at Seattle-Tacoma International and Boeing Field/King County International airports. This study provides a comprehensive strategy for dealing with future air cargo needs in the Puget Sound Region.

Airspace Analysis

Airspace capacity analysis is primarily an FAA function as stated in Advisory Circular 150/5070-7 (507.b.2). Resolution of airspace conflicts are systematic in nature and handled by the FAA. As a result, the State has limited influence in this area. The airspace analysis conducted during LATS addressed airspace associated with Washington's public use airports to determine areas where airspace interactions or overlaps occur. Additionally, the analysis examined whether such interactions or overlaps need to be addressed when analyzing future system improvements.

Major findings from the airspace analysis are summarized below.

No significant airspace overlaps occur outside of the Puget Sound Region

- No significant airspace overlaps occur outside of the Special Emphasis Regions.
- The majority of overlaps occur within the Puget Sound Special Emphasis Region where population is the greatest.
- Airspace within Washington State is subject to overlap from airports outside of the state. More specifically, airports in Southwest Washington are affected by Portland International Airport.

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The biggest airspace overlap in terms of potential operational conflict occurs between Sea-Tac and Boeing Field

- Seattle-Tacoma International and Boeing Field/King County International show the biggest airspace overlap in terms of potential operational conflict. As such, their proximity requires flight path coordination between the two airports.
- Further study of airspace capacity and available technologies is needed to address future demand anticipated for the Central Puget Sound area. Such a study would fall under the purview of the FAA.

High Speed Rail Findings

LATS also conducted a high-speed rail assessment to determine whether rail system improvements could alleviate forecast capacity constraints at Washington airports. High-speed rail could provide relief to the Washington State aviation system in one of two ways:

- Providing a viable alternative to flying between certain city pairs (and thus help mitigate aviation demand levels)
- Providing improved airport access and connectivity to nearby airports as Seattle-Tacoma International reaches passenger capacity.

Three intercity passenger rail lines currently provide service to Washington State:

1. Amtrak Coast Starlight Service;
2. Amtrak Empire Builder Service; and
3. Amtrak Cascades Service.

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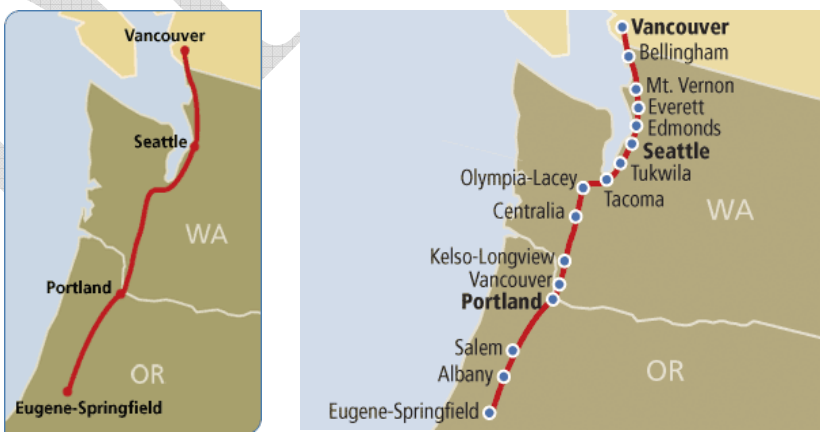
Figure 14: Amtrak Coast Starlight Service

Source: Amtrak.com (accessed March 2007)

Figure 15: Amtrak Empire Builder Service

Source: Amtrak.com (accessed March 2007)

Figure 16: Amtrak Cascades Service



Source: Amtrak.com (accessed March 2007)

The key findings from the high-speed rail assessment are as follows:

- High-speed rail is not an adequate option for relieving airport congestion.

High speed rail will not alleviate airport congestion by a significant amount

  - Analysis results showed that feasible high-speed systems will not alleviate airport congestion levels by a significant amount, even though high-speed ground transportation systems 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.
  - Intercity passenger rail service in Washington State is currently limited to state-supported Amtrak Cascades service between Vancouver (BC), Seattle, Portland (OR), and Eugene (OR) and nominal Amtrak east-west service on long-distance oriented trains.

- Improvements to intercity rail service are limited by rail network capacity.

  - Potential future improvements in intercity rail service are limited by the state's rail network capacity issues, particularly for east-west routes, and by the geographic distances between major population centers.

Due to limited capacity on intercity rail service, passengers diverted from Sea-Tac remain a small percentage of overall passengers

  - The Department of Transportation has developed an ambitious long-range plan for service improvements in the Amtrak Cascades corridor. The proposed improvements are projected by the Department to attract significantly more riders than the current service, and the LATS ridership analyses generally support these forecasts. However, the number of Seattle-Tacoma International passengers diverted to the improved rail system represents only a very small percentage of the overall number of air passengers that will use the airport.

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- Rail service levels are not sufficient to shift airport choice patterns.

Rail service levels are not sufficiently superior to driving – passengers will likely continue to drive to their current airport of choice

  - Even though the Amtrak Cascades Corridor improvements, coupled with ongoing transit improvements in Vancouver (BC), Seattle, and Portland (OR), will provide for potential improvements in air-rail connectivity and in passengers' abilities to use alternative airports, the service levels that will be offered will not be sufficiently superior to existing auto based airport access options to produce significant shifts in airport choice that will not otherwise occur with a congested aviation system.

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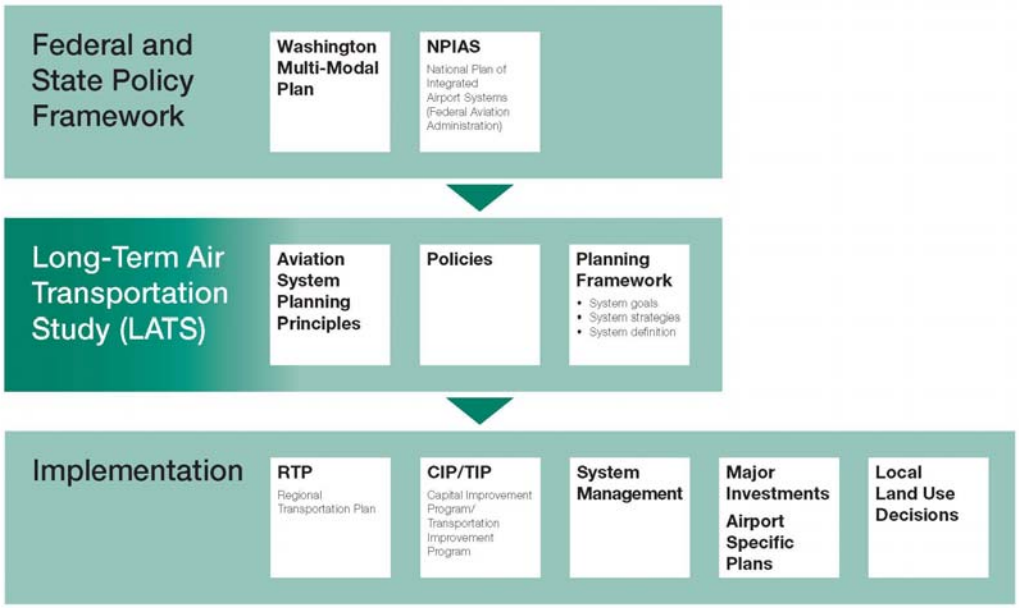
LATS Policy Recommendations

Policy recommendations were developed to help guide the Washington aviation system

A primary responsibility of the Washington State Aviation Planning Council was to develop a series of policy recommendations for the state's aviation system. These policies are intended to guide decisions regarding how best to meet Washington's long-term aviation needs. As shown in Figure 17, proposed policies for the Washington State aviation system will be considered in the context of the State Transportation Goals, the Washington Transportation Plan, and Federal Aviation Administration guidance.

Figure 17: Washington Aviation System Planning Hierarchy



The Council's policy recommendations are based on a series of Guiding Principles

To provide the framework for developing specific policy recommendations, the Aviation Planning Council first adopted a series of nine Guiding Principles. The Guiding Principles represent assumptions intended to direct state policy in all aspects of its aviation programs. These Guiding Principles are presented below.

1. Washington's communities depend on their ability to access Washington State's aviation system to move people and goods safely and securely throughout the State, nation and the world. Washington's aviation system is an essential and integral component of local, state and national economies and must be sustained.

2. Washington State's aviation system should be considered in terms of commercial aviation, general aviation and aviation support facilities (landside and airside) as well as airspace. Furthermore, decisions about Washington's aviation system should be considered in the context of national and international aviation.

3. It will take strong partnerships to effectively address the challenges facing Washington's aviation system between airports, the aviation industry, business community, local, regional and tribal government, educational institutions, Washington State, and the Federal Aviation Administration.

4. To safeguard Washington State's aviation system for future generations, the state must address multiple challenges in a timely manner including: capacity exacerbated by growing demand, delayed maintenance, incompatible land use, funding, work force, and the special needs of small communities.

5. Washington's aviation system currently suffers from a significant funding shortfall that is leading to deferred maintenance that will cost even more to address over the long run. Without adequate maintenance, Washington's aviation system will crumble. Needed revenue for maintenance and preservation of airports should be collected and distributed in an equitable manner.

6. To maximize value and impact of public investment in the aviation system statewide will require strategic and targeted investment that looks first to making the best use of our current assets. We must preserve the system we have in place, and then enhance the capacity of existing facilities with technological innovation and system management best practices. In doing so, we must take into account different roles of airports, serving Washington's diverse communities.

7. Washington's aviation system should be planned to coordinate with other transportation modes to assure effective, efficient, and complementary transportation options for people and goods.

8. Capacity investments must be considered in the context of environmental and social impacts such as noise, air quality, water quality, impacts on adjacent communities, and climate change.

9. The decision-making about the expansion or siting of airports should be made through an open and public

process, taking into account the ultimate need to serve the broadest long term interest of the residents of Washington State and our national security.

These Guiding Principles provide the foundation for the specific aviation policy recommendations developed by the Aviation Planning Council. The policy recommendations are related to the following seven key areas:

Policy recommendations have been developed for seven key areas

- **Capacity:** Policy recommendations focus on the State's role in ensuring the capability of the statewide aviation system to meet future operations demand. Where demand is anticipated to exceed system capacity, recommendations are made as to additional actions that may be needed to maintain and/or expand the system.
- **Land Use:** These policy recommendations address the need to protect airports from encroachment by development of incompatible uses in the airport vicinity. The policies address regulation of incompatible land uses as well as airspace intrusions at both the State and local levels.
- **Environment:** The Environmental policies address a range of issues, from mitigating adverse impacts to wildlife protection, energy conservation, alternative fuels and waste reduction.
- **Safety:** The need for aviation system safety is addressed through policy recommendations on the application of design criteria and safety standards, instrumentation and weather reporting, as well as identification of airports critical to the Washington Comprehensive Emergency Management Plan.
- **Stewardship:** Proposed stewardship policies address issues including but not limited to maintenance of the State's system plan, capital investment and funding, technical assistance to airports and the potential for public/private partnerships.
- **Economy:** Policies relevant to the economy address airports not only as supporting the economic growth of the State, but also the need of the State to support airports through investment in aviation infrastructure and education.
- **Mobility:** The Mobility policies stress the importance of the aviation system as an integral part of Washington's overall transportation infrastructure. Washington airports

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link the State to the national air transportation system. Federal, state, regional and local transportation agencies need to be involved in the planning and development of an integrated transportation system.

Policy Recommendations of the Aviation Planning Council

The specific policy recommendations developed by the Washington State Aviation Planning Council within each key area are presented below.

Capacity

1. The State of Washington must take a lead role in addressing its long-term aviation system capacity needs from a system-wide and regional perspective.

2. Washington State shall place a funding and planning priority on maximizing the efficiency and utility of the existing aviation system before creating new airports.

3. If Washington State's existing system cannot provide sufficient aviation capacity to meet existing and future demand and no sponsor has emerged, the state will be given the authority to undertake a site selection process for a new airport.

Land Use

1. Washington State should strengthen legislation to define and prohibit incompatible land uses and promote appropriate land uses adjacent to public use airports.

2. The State should use a combination of incentives, legislation and regulatory tools to ensure that local governments address land use requirements to protect airports as essential public facilities, discouraging the encroachment of incompatible land uses adjacent to public use airports.

3. Washington State should develop performance measures to assess how well local governments and local comprehensive plans and policies discourage incompatible development adjacent to public use airport.

4. The State should prohibit airspace intrusion around airports and runway approach paths by structural, visual, or wildlife hazards that could potentially impact airport operations or endanger the safety and welfare of aviation users.

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5. Regional Transportation Planning Organizations should be given the authority to certify the transportation and land use element of local comprehensive plans, in order to discourage incompatible development adjacent to public use airports and to ensure consistency of comprehensive plan components and regulations across jurisdictional boundaries.

6. Washington State should develop standards discouraging new development of K-12 public schools, daycare centers and medical facilities adjacent to public use airports.

7. Washington State should require that airport sponsors and local jurisdictions coordinate with each other during the development and amendment of airport master plans and comprehensive plans/development regulations.

Environment

1. Washington State should require airports to appropriately mitigate adverse environmental impacts to threatened and endangered species and habitats occurring at airports, while reducing wildlife attractants that create hazards to airport operations.

2. Airport facilities and operations plans should use best management practices including energy conservation, alternative fuels, and waste reduction.

3. Airports should incorporate evolving state and federal greenhouse gas reduction strategies and/or standards pertaining to air transportation so as to minimize the adverse health and environmental impacts on air quality and the climate while promoting jobs and economic development in a sustainable manner.

4. Statewide and regional strategies should be developed that provide and coordinate a range of transportation mode options for access to public use airports through airport and highway design projects.

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Safety

1. Washington State should use incentives, including state and federal resources, to ensure that airport facilities meet applicable federal or state design criteria and safety standards.

2. The State should identify strategic aviation facilities to support the Washington Comprehensive Emergency Management Plan.

3. Washington State should encourage and support precision instrument approach procedures at all airports with a classification service role of "Regional Service Airport" or higher, and non-precision instrument approach procedures at all airports with a service role of "Community Service Airport" or higher.

Stewardship

1. The Washington State Airport Classification System will help guide decisions on future aviation system needs and investments.

2. Washington State should work with the FAA and regional transportation planning organizations to identify additional airports that can meet federal criteria for classification as reliever airports between 2008 and 2035.

3. The Washington Aviation System Plan (WASP) should be periodically updated to include the following:

   a. Incorporate economic development studies, aviation forecasts, pavement conditions analysis, capacity analysis, airport facility assessment studies and other studies as appropriate to keep the system plan up-to-date to meet changing conditions in the air transportation system.

   b. At each update cycle, reevaluate Washington State Airport Classification System designations for airports to respond to changing conditions and ensure that airport facilities are meeting established performance standards.

   c. Maintain a relational database, including physical and operational airport inventory information to support Aviation System Planning and the statewide aviation capital investment program.

4. Washington State should ensure that the aviation capital investment program strategically prioritizes system investments to serve the state's air transportation system needs in a cost-effective manner.

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5. Provide technical assistance to airports and promote methods that optimize the net public benefit, as consistent with the WASP, airport master plans, and state and federal assurances and guidelines.

6. Support joint public-private partnership and private sector initiatives to provide transportation facilities and services that protect the public interest, such that:

- Public expenditures can be reduced
- Access to aviation facilities is enhanced
- The quality, quantity and stability of service is maintained and/or
- Environmental impacts are reduced.

7. Where gaps exist in the aviation system, it may be in the State's interest to own, operate, or develop airports.

8. The regional transportation planning process should be coordinated with the aviation system plan and local airport master plans to maximize public benefits.

9. It is in the state's interest to implement airport grant terms and conditions that will preserve and protect the State's investments in the system.

10. The State should work with the FAA to encourage investment in facilities and technologies that improve airspace efficiency across Washington State.

Economy

1. Washington State should consider state, regional, or national outcomes in the analyses of aviation investments and policy recommendations.

2. Washington State should encourage and support education infrastructure to train and educate the skilled workforce necessary to support aviation.

3. Washington State should work with state and local economic development agencies to support adequate aviation capacity, services and facilities to support economic growth.

Mobility

1. Washington's aviation facilities should be planned and developed as an integrated system that meets statewide air transportation demand; complements the overall state

transportation system; maximizes the use of existing facilities; and is compatible with the environment.

2. The State should promote adequate access to the national air transportation system for all Washington residents, using adopted standards of the Washington State Airport Classification System.

3. The State should identify transportation needs that extend into adjacent states and promote bi-state/multi modal cooperative solutions to ensure coordinated services and maximum cost effectiveness.

4. Washington State should coordinate with federal, state, regional and local transportation agencies to encourage effective ground access to airports through various modes of transportation, freight/cargo efficiencies and rail and road enhancement projects.

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System Recommendations

[To be provided pending public input on the Alternatives Analysis and formulation of final Council policy]

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