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Westport Municipal Airport
Westport, Washington

AIRPORT LAYOUT PLAN REPORT

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Chapter One INVENTORY

INTRODUCTION

The initial step in the preparation of an Airport Layout Plan Report is to collect data pertaining to the airport and the area it serves. The inventory task for Westport Municipal Airport was achieved through a physical inspection of all existing facilities, discussions and interviews with the Airport owner and its users, and a review of previous Airport studies and records.

This chapter provides a summary of the Airport's location, history, climate, historical activity levels, existing airfield and landside facilities, and existing land uses on and around the Airport. The information gathered as part of this initial step becomes the basis for various analyses completed in subsequent chapters. By establishing a thorough and accurate inventory, appropriate forecasts and future development needs can be defined.

AIRPORT LOCATION & ACCESS

Westport Municipal Airport is located in the City of Westport, within Grays Harbor County, Washington. Grays Harbor County is at the south end of the Olympic Peninsula, bordering the Pacific Ocean. The City of Westport, population 2,305, is situated on a peninsula (Point Chehalis) at the mouth of Grays Harbor in the southwestern portion of the county. Westport is approximately 70 miles west of Olympia, and nearly equidistant from Seattle (130 miles) and Portland (163 miles). The city is served by State Highway 105, which connects to I-5 via U.S.

Highway 12. The Airport is located two miles from Highway 105. **Exhibit 1A** shows a map of the region and vicinity of the Airport.

The Grays Harbor Transportation Authority operates bus service throughout the County and the closest stop is 0.3 miles south of the airport. On weekends and summer holidays there is also dial-a-ride service. The Westport-Ocean Shores Ferry operates seasonal service from Float 6 at the Westport Marina to Ocean Shores, which is the city located across the mouth of Grays Harbor to the north. South Beach Cab operates a taxi service in the Westport/Grayland area. Several rental car facilities are available in Aberdeen, approximately 22 miles east of the Airport.

AREA TOPOGRAPHY

The Westport peninsula and the adjacent Pacific Ocean and Grays Harbor shorelines are low and flat. Shorelines are sandy or vegetated wetlands. Bogs in the Grayland - North Cove area south of Westport are uniquely suited for growing cranberries. Not far inland from the south side of Grays Harbor, the terrain is hilly and heavily forested with deciduous trees. Nearly 90% of the land area of Grays Harbor County is forested.

The Westport Municipal Airport has an estimated elevation of 14 feet above Mean Sea Level (MSL). The Airport is located on the east side of the Westport peninsula and much of the property is low tidal flats.

CLIMATE

Westport has a marine climate with mild, wet winters, and cool, dry summers. Winter temperatures in Westport generally range from 45 to 55 degrees Fahrenheit, and summer temperatures generally range from 60 to 70 degrees Fahrenheit. Annual rainfall averages about 70 inches, with the majority of it occurring between the months of November and March. Annual snowfall averages about 5 inches per year. The prevailing winds are generally from the southwest, but during the summer are more from the north and northwest. The mean maximum temperature in the hottest month is 68 degrees.

COMMUNITY AND AIRPORT HISTORY

The area was inhabited by Native Americans long before Robert Gray sailed into Grays Harbor in 1792. After Lewis and Clark visited the region in 1805, fur traders followed. By 1840 the fur trade was replaced by fishing and logging and by 1900, logging was the dominant industry in the region. Perhaps the greatest period of economic growth in Grays Harbor County was during World War I, when wooden ships were being mass-produced. The City of Westport, incorporated in 1914, has always had an economy based on fishing, shellfish harvesting, seafood processing, and tourism. Boat-building, primarily by Westport Shipyards, became an important part of the local economy more recently. The Coast Guard Station in Westport, fully equipped for land and sea rescue, serves the coastal region. The Westport Lighthouse, dedicated in 1898, is a symbol of the community. Visitor attractions also include Westport's Aquarium, Maritime Museum, Marina and the Westhaven, Westport Light, and Twin Harbors State Parks.

The City of Westport owns and operates the Airport. The Airport was first established in the 1930's. The runway was originally a grass strip with a length of 1,970 feet and a width of 250 feet. The elevation was such that the Airport closed during high tide and winter months as conditions were too wet for safe operations. The runway was paved in the 1970's and in 1991, the runway was lengthened and the Airport elevation was raised. The Airport is now available for use year-round. The most recent airport improvement, funded largely by a grant from WSDOT, was seal-coating of the taxiway and apron in 2003.

Past state grants to Westport include the following:

- 1992 - $50,000 grant for runway paving (19,000 square yards BST)
- 1993 - $43,600 grant for 600' security fencing, parking & tiedowns, wind sock & paint, runway lighting, and taxiway stubs
- 2003 - $17,500 grant to slurry seal the apron pavement
- 2005 - $33,602 grant for Airport Layout Plan

AVIATION ACTIVITY

As shown in Table 1A, four airports available for public use are located within 20 statute miles, or 17 nautical miles (nm), of Westport Municipal Airport. However, none of these airports are within a 30-minute drive.[1]

Table 1A, Public Use Airports near Westport

Airport	Identifier	Distance/Direction from Westport	City	General Facility Description
Westport Municipal Airport	14S		Westport	Paved 2,317' runway, visual approaches
Ocean Shores Municipal Airport	W04	6.6 nm NNW	Ocean Shores	Paved 2,700' runway, visual approaches
Bowerman Field	HQM	8.1 nm ENE	Hoquiam	Paved 5,000' runway, instrument approaches
Hogan's Corner Airport	5WA8	8.9 nm N	Ocean Shores	Privately owned, paved 3,700' runway, visual approaches
Copalis State Airport	S16	14.1 nm NNW	Copalis	Sand 4,500' runway, visual approaches
Willapa Harbor Airport	2S9	16.5 nm SE	South Bend/ Raymond	Paved 3,005' runway, visual approaches

Source: FAA Airport Master Records and AirNav.com

[1] The FAA's National Plan of Integrated Airport Systems (NPIAS) states that 98.11% of the nation's population is within 20-miles, or 30 minutes, of a public use airport included in the NPIAS. The NPIAS designates airports of national significance that are eligible for federal Airport Improvement Program grants. Westport Municipal Airport is not included in the NPIAS, but might be in the future, because of its location relative to other NPIAS airports and other factors.

The Coast Guard Station located north of the Airport has a helipad. Coast Guard helicopters from the Station in Astoria patrol and conduct other mission-related and training flights in the Grays Harbor area. A representative of the Astoria Station reports a Coast Guard helicopter is in the Westport vicinity about once per weekday on average.

Airport Service Area

The service area for Westport Municipal Airport encompasses the small towns and rural development along Highway 105 within 20 statute miles of the airport. Consequently, the service area extends east along the southern shore of Grays Harbor past Markham and south as far as Tokeland, which is located on Willapa Harbor in Pacific County. Westport Municipal's service area abuts the service areas for Bowerman Field, located in Hoquiam, and Willapa Harbor Airport, located 2 miles northwest of Raymond.

According to the FAA Registry, two registered aircraft and four certificated airmen are located within Westport's service area. Both aircraft are registered to people with Westport addresses and three of the four pilots are Westport residents. The fourth pilot resides in Grayland, just south of Westport.

Based Aircraft

Based aircraft are those that are stored at an airport, either in a hangar or on an apron. The Washington State Aviation System Plan (WSASP) Database records indicate that Westport Municipal Airport had three based aircraft in 1999 and 2002, two single-engine and one multiengine piston aircraft. Currently there are two single-engine piston type aircraft with maximum takeoff weights less than 12,500 pounds based at the Airport. One is a Cessna 170A and the other is a Cessna 210L. Both are stored off airport property, but have through-the-fence[2] access to the airport. Westport Shipyard has a hangar located on airport property; in the past, the company's multiengine piston aircraft (Piper Aztec) was based in the hangar.

Aircraft Operations

Aircraft operations are another measure of aviation activity. An aircraft operation is a landing or a takeoff by a based or transient aircraft. A touch-and-go, which occurs during pilot training, counts as two operations. Touch-and-go operations are categorized as local, along with other operations that remain within 20 miles of the airport. Operations that are not categorized as local are categorized as itinerant. Air Taxi operations are "for-hire" chartered flights in small aircraft, while General Aviation (GA) operations are those conducted by private and business aircraft owners. According to the WSASP Database and FAA Airport Master Record (Form 5010), 11,400 aircraft operations occurred at Westport Municipal Airport in 2002, the most recent year with published data:

[2] "Through-the-fence" describes a situation where an aircraft or aviation business is not located on airport property, but has access to the airfield for taxiing aircraft.

Air Taxi	1,500
General Aviation Local	2,200
General Aviation Itinerant	7,700
Total	11,400

EXISTING FACILITIES

Existing facilities at Westport Municipal Airport are divided into three categories: airfield, landside, and support facilities. Airfield facilities include areas such as runways, taxiways, and aprons. Landside facilities include areas such as hangars, airport buildings, and auto parking. Support facilities include emergency services, utilities, and other miscellaneous facilities that do not logically fall into either airfield or landside facilities. An existing facilities drawing is depicted in **Exhibit 1B**.

Airfield Facilities

Airfield facilities include pavements used for aircraft movement, such as runways, taxiways, and aprons. In 2005, WSDOT Aviation hired a consultant to update the Pavement Condition Index (PCI) at all public-use airports in Washington State. Pavement conditions were rated on a scale of 0-100 with 0 being a failing pavement and 100 reflecting pavement in excellent condition. Generally ratings with a PCI above 70 require only preventative maintenance in the short term, while ratings between 40 and 70 require major rehabilitation and ratings less than 40 require reconstruction. **Exhibit 1C** depicts the pavement condition map for Westport Municipal Airport.

Runway. Westport Municipal Airport has one paved, runway oriented on a heading of 12-30. The runway is 2,317 feet long and 50 feet wide, with 10-foot wide grass shoulders. A 75-foot by 60-foot turnaround is located on the Runway 30 end. The runway pavement is Bituminous Surface Treatment (BST), which has a PCI rating of 81. The Runway 30 turnaround pavement has a PCI rating of 92. The pavement strength rating of Runway 12-30 is unknown. In order to determine the existing pavement strength rating, a geotechnical core sample analysis would be needed.

Taxiways. Runway 12-30 has a partial parallel taxiway, 390 feet long and 30 feet wide, and two connector taxiways. The taxiway surfaces are BST and have PCI ratings between 85 and 90, as shown on Exhibit 1C. In addition, a private, turf taxiway provides access to the off-airport home where one of the based aircraft is located.

Aprons and Aircraft Parking. There is one aircraft apron located on the west side of the runway. It is 400 feet by 175 feet and has 14 tie-down positions. The BST apron has a PCI rating of 89.

Airfield Lighting. Runway 12-30 has Medium Intensity Runway Lights (MIRL), which are not pilot-activated, but are on from dusk to dawn. There is no edge lighting on the airport taxiways or apron; however, there are reflectors located along both connector taxiways. The apron and adjacent vehicle parking area is dimly lit by pole-mounted area lights.

Airport Navigational Aids. Airport Navigational Aids, or NAVAIDS, provide navigational assistance to aircraft for approaches to an airport. NAVAIDS are typically classified as either visual approach aids or instrument approach aids; the former providing a visual navigational tool, and the latter being an instrument-based navigational tool. The types of approaches available at an airport are based on the NAVAIDS which are provided.

Visual Approach Aids. Each runway end has a two-box Visual Approach Slope Indicator (VASI), but they are currently inoperable due to vandalism of the light boxes. A VASI gives glide slope information to a pilot on final approach by displaying sequences of different colored lights. Based on the lights displayed, a pilot can then make the necessary altitude adjustments to ensure the correct glide slope for landing.

Instrument Approach Aids. Neither Runway 12 nor 30 has an instrument approach which can be used when the visibility and cloud ceiling are below minimums for Visual Flight Rules (VFR) conditions.

Other NAVAIDS. There is a lighted wind cone and segmented circle located on the west side of the runway at approximately the midfield point. The closest source of real-time weather reporting for pilots is the Automated Surface Observing System (ASOS) at Bowerman Field, located 8 nm to the northeast. Westport Municipal Airport does not have a rotating beacon.

Landside Facilities

Airport Buildings. There are two 3,600 square foot hangars located at the Airport. One is privately owned by Westport Shipyard under a ground lease from the City. The other is not located within the airport property boundary, but it is adjacent to the apron on the north side and has access to the airfield "through-the-fence." There is also a portable latrine at the airport, but no pilots' lounge or other buildings on the Airport property.

Aviation Services. A fixed based operator is an individual or a business that offers aviation-related services such as flight instruction, aircraft rental, aircraft maintenance, hangar/tiedown storage, and aircraft fueling to Airport users. There are no fixed based operators or other aviation services available at the Airport. The owner of the off-airport hangar adjacent to the apron has operated an aviation business (After Hours Aviation) in the past, but is not doing so now.

Airport Access and Vehicle Parking. Access to the Airport is via the SR105 Spur (Montesano Street). The spur begins at the intersection of SR 105 at the south end of the peninsula and continues north to the marina. The street is designated a bicycle route in the City's Park and Recreation Plan.

There is a paved automobile parking lot adjacent to the apron area on the west side of the airfield. The parking lot is approximately 900 square yards. There are no designated parking stalls; the pavement is not marked.

Airport Support Facilities

Emergency Services. There are no Aircraft Rescue and Firefighting (ARFF) facilities available at the Airport. Emergency services are provided by City of Westport Fire and Police Departments.

Airport Maintenance. Airport maintenance is provided by the City of Westport Streets Department and supplemented by prison workers from nearby Cedar Creek Prison.

Airport Fencing. A four-foot high chain-link fence surrounds the tie-down apron. There is a pedestrian gate located in the parking lot which provides direct access to the apron.

Utilities. Utilities available at the Airport include: electricity, provided by the Grays Harbor County Public Utility District Number 1, and water and sewer, provided by the City.

Airport Signage. Guidance signs are located on Highway 105 and along Montesano Street.

Other Support Facilities. There is a restaurant immediately adjacent to the Airport. Other restaurants, lodging, shops, and other amenities are within walking distance of the Airport.

RATES & CHARGES

The City of Westport receives approximately $1,200 per year from a ground lease for the Westport Shipyard hangar. The City does not charge fees for tie-downs or the through-the-fence operations; however there is a Letter of Agreement in place between the City and one of the hangar owners.

LAND USE PLANNING & ZONING

There are several land use requirements, on the Federal, State, County and City levels, that need to be considered when reviewing existing land uses and planning for future development at and around an airport.

Federal regulations are generally concerned with airspace protection (14 CFR Part 77) and noise levels, particularly for areas that fall within the 65 decibel (dBA) noise contour line. 14 CFR Part 77, *Objects Affecting Navigable Airspace,* established obstruction standards used to identify potential adverse effects to air navigation and established notice standards for proposed construction. Imaginary surfaces were created and are used as the basis for protecting the airspace around an airport. There are five imaginary surfaces, each with specific controlling measures: a primary surface, an approach surface, a transitional surface, a horizontal surface and a conical surface. It is ideal to keep these surfaces clear of any and all obstructions.

Although Westport Municipal Airport is not currently in the NPIAS, FAA guidelines state that, before FAA grants can be received, the airport sponsor must provide assurances that appropriate actions have been (or will be) taken to the extent reasonable, to restrict the use of land adjacent

to or in the immediate vicinity of the airport, to activities and purposes compatible with normal airport operations.

Washington State regulations are based on the Growth Management Act (GMA), Chapter 36.70A of the Revised Code of Washington, which requires counties and cities to adopt goals, and regulations to discourage the siting of incompatible uses near airports that are open for public use.

The GMA establishes four basic principles related to public use airports:

- Local Ordinances must protect public use airports from development of incompatible land uses
- Formal consultation with airport owners, ports, pilots and WSDOT Aviation is required prior to adoption
- WSDOT Aviation is to provide a technical assistance program to develop such protection
- Airport to be identified as an Essential Public Facility (EPF) in the Comprehensive Plan.

Grays Harbor County is not a fully planning jurisdiction under Washington's Growth Management Act because of its historical slow growth and high unemployment; however, the airport land use principles discussed above do apply to Westport Municipal Airport. In addition, the county has enacted zoning ordinances to protect agricultural lands. The county and city also have enacted flood plain regulations. The Westport Shorelines Master Program is part of the federally approved Coastal Zone Management Act for the State of Washington.

Westport Municipal Airport is controlled by the City of Westport's comprehensive plan and zoning ordinance. The following subsections describe the existing land uses and zoning that are currently in place.

Comprehensive Plan Goals and Policies

The City of Westport adopted a comprehensive plan in April of 1998. The comprehensive plan was last revised in February of 1999. The plan provides a vision for the City that is implemented through goals and policies that are defined within the plan.

Westport Municipal Airport is addressed in Chapter 5, Circulation Element, of the comprehensive plan. The section on the Airport addresses the goals, objectives, and policies of the City as it relates to developing the Airport. Emphasis is placed on developing the Airport into a year-round facility (which it now is). The Airport Circulation section does not provide a description of the Airport, nor does it define the Airport as an Essential Public Facility (EPF). Language is included which restricts uses that create hazard or conflict with safe and effective operations (such as tall structures, visual pollution through smoke or dust, and uses which emit transmissions). The policy listed in this section is as follows:

> "The City of Westport shall, when necessary, incorporate an airport overlay zone into the existing and/or subsequent city zoning ordinance(s) which addresses at a minimum, the following:

a. Height Restrictions
b. Compatible land uses with the airport area related to sound levels and overflight hazards
c. Condition zoning and platting approvals as necessary to meet the above restrictions on residential development.

Exhibit 1D shows the City of Westport's Comprehensive Land Use, Shoreline, and Zoning Map.

Existing Land Use

Westport Municipal Airport is surrounded by many different types of land uses. The areas directly to the east and southeast of the airport consist of wetland and vegetation areas. On the north side of the airport is an amusement park and industrial area. The land to the west and south of the airport is a combination of many uses including mini-storage, an RV park, wooded land, and residences.

Existing Zoning

Zoning ordinances and descriptions are discussed in Chapter 17 of the City of Westport's Municipal Code. The City of Westport contains 7.12 square miles, zoned as follows: 8% Industrial, 27% Commercial, 29% Residential, and 36% Recreation.

Westport Municipal Airport, and the area immediately east of the airport, are located in the city's Mixed Use-Tourist Commercial 1 (MU-TC 1) Zone. The intent of this zone is to provide a mixture of commercial tourist and residential uses within a close proximity. Permitted uses within this zone include public facilities such as marinas, ferry terminals, parks and recreation facilities, restaurants, hotels/motels, day care centers, schools, churches, retail sales (limited to 25,000 square feet) and residential uses (densities up to twenty four units per acre). Building heights within this zone are limited to 35 feet or three stories.

The area directly north of the airport is zoned as Marine Industrial (MI). The purpose of this zone is to reserve space for industrial related activities that benefit from the city's marine location. Permitted uses within this area include fish and seafood handling, storage, processing, wholesale, etc., boatyards and boat or barge construction and repair, boat sales, cargo shipping and receiving, marine fuel sales, truck terminals, equipment sales and machine shops, and other marine industrial uses. Amusement parks are also permitted in this zone. A specific allowed density is not listed for this zone. The maximum height of buildings within this zone is 50 feet.

The area adjacent to the airport on the east and south sides is zoned as Conservancy. This area is part of the City's Shoreline Management Overlay Zone. The Conservancy shoreline designation is a designation to conserve and protect natural resources, such as ocean beaches and estuary wetlands. Permitted uses in this zone (subject to the city's Shoreline Master Program policies and regulations) include: oyster culture, commercial fishing and shellfish harvesting, navigational aids, public boat ramps and fishing areas, tree farms, wildlife refuges, and local market farming. The maximum residential density allowed in this zone is one dwelling unit per five acres. A building height limitation in this zone is not defined.

Other zones within a two mile radius of the airport include a Mixed Use-Tourist Commercial 2 Zone (MU-TC 2), Residential 1 (R-1), Residential 2 (R-2), and Tourist Commercial (TC). The MU-TC 2 Zone permits the same uses as the MU-TC 1 Zone (described above), except that retail sales on sites over five acres in size may be up to 65,000 square feet and/or buildings may be constructed up to 50 feet or five stories, whichever is less. The R-1 Zone is classified as a low density residential area which permits single-family homes, townhouses with less than four units per building, duplexes, and multifamily homes with less than four units per building. The maximum density allowed in this zone is eight units per acre. The R-2 Zone is a medium density residential area which permits the same uses as the R-1 Zone, but allows a maximum density of 18 units per acre. The TC Zone is an area that allows for master planned destination tourist resorts. Uses allowed in this area include residential (hotels, condominiums, apartments), recreational and gaming facilities (conference centers, movie theatres, golf courses), and commercial tourism services (restaurants, lounges, retail hotels). Development standards in this area will be adopted once a master planned area is approved by the City.

In addition, the City of Westport's zoning ordinance includes a chapter called Airport Obstruction Zones. This chapter incorporates Part 77 imaginary surfaces and essentially serves as an overlay zone for the Airport. Heights of objects within this zone are limited by Part 77 regulations. The definitions of each imaginary surface will be discussed in subsequent chapters.

Chapter Two Forecasts

INTRODUCTION

Aviation demand forecasts help to determine the size and timing of needed airport improvements. This chapter indicates the types and levels of aviation activity expected at Westport Municipal Airport during the forecast period of 2006 through 2026. The methodology followed is from "Forecasting Aviation Activity by Airport," GRA, Incorporated, July 2001. This is the accepted standard by the FAA.

AVIATION ACTIVITY PARAMETERS AND MEASURES TO FORECASTS

For Westport Municipal Airport, the following activity categories are projected:

- Based Aircraft
- Aircraft Operations
- Airport Reference Code, which defines the appropriate FAA criteria for airport design and is determined by the most demanding, or critical, aircraft that regularly uses the airport

PREVIOUS AIRPORT FORECASTS

WSDOT Aviation Division's *Aviation System Plan – Forecast and Economic Significance Study* contains the forecasts for Westport Municipal Airport that appear in **Table 2A**. The methodology used was to forecast registered aircraft in the state, distribute them to individual counties and airports, and then determine aircraft operations from the ratio of operations to based aircraft, with an adjustment to increase the utilization rate of aircraft slightly in the future.

Table 2A, Washington Aviation System Plan Forecasts

Year	2000	2005	2010	2015	2020	Annual Growth 2000-2020
Aircraft Operations	11,400	11,400	11,500	11,500	11,600	0.1%
Total Based Aircraft	3	3	3	3	3	0.0%

Source: WSDOT Aviation System Plan-Forecast & Economic Significance Study

NATIONAL AVIATION TRENDS AND FORECASTS

FAA Aerospace Forecasts Fiscal Years 2006-2017, published February 2006, describes aviation trends and forecasts growth in general aviation aircraft, hours flown, and pilots. Comparing 2005 with 2004, general aviation aircraft manufacturers reported a 10% increase in shipments, the active general aviation fleet grew 1%, and flight hours increased nearly 4%. The number of student pilots decreased slightly, ending two consecutive years of growth. In 2005, the total number of active pilot certificates was 609,603, general aviation aircraft hours flown totaled 28.3 million, and the active general aviation fleet totaled 214,591 aircraft. Two-thirds of the active general aviation fleet was single engine piston aircraft similar to those now based at Westport Municipal Airport.

The FAA projects 0.9% annual growth in pilots through 2017 and the active general aviation fleet is projected to grow at an average annual rate of 1.4%. The business/corporate side of general aviation is expected to continue growing faster than personal/sport use, benefiting from a growing market for the new, relatively inexpensive (between $1 and $2 million) microjets. The FAA's forecast assumes that 100 microjets, which are also called Very Light Jets (VLJ), will enter the market in 2006, growing to 4,950 aircraft by 2017. Some believe that the VLJ will revolutionize the aviation industry by supporting true "air taxi" service. In fact, DayJet recently announced its plan to launch, in late 2006, a "per-seat, on-demand" jet service throughout the southeastern U.S. using a fleet of Eclipse 500 VLJ aircraft. The FAA also projects high growth for the new category of Light Sport Aircraft.[1] Rotorcraft (helicopters) and fixed wing turbine aircraft are projected to increase at higher rates than fixed wing piston aircraft. Increased utilization of aircraft is projected for the future, resulting in higher growth rates for hours flown than for the number of aircraft. **Table 2B** presents the FAA's forecast growth rates for general aviation aircraft and hours flown.

[1] In 2004, the Sport Pilot Rule was issued, requiring a driver's license, rather than a medical certificate, a factor that may draw older pilots back into aviation. Sport Aircraft is a new category of aircraft for the FAA, so there is no historical record of numbers.

Table 2B, FAA General Aviation Forecasts, Average Annual Growth Rates, 2006-2017

Aircraft Category	Aircraft	Hours Flown
Total Piston Fixed Wing	0.3%	1.2%
Single-Engine	0.3%	1.2%
Multiengine	0.1%	1.1%
Total Turbine Fixed Wing	4.3%	7.5%
Turboprop	2.2%	1.2%
Turbojet	6.0%	10.2%
Total Rotorcraft	4.4%	3.9%
Piston	6.7%	6.8%
Turbine	2.7%	2.8%
Experimental	1.2%	1.7%
Light Sport (2007-2017)	19.5%	21.9%

Source: FAA Aerospace Forecasts Fiscal Years 2006-2017

SOCIOECONOMIC FORECASTS

Population and economic growth within an airport's service area usually correlates with growth of aviation activity at the airport. **Table 2C** shows historical population for Grays Harbor and Pacific Counties, which encompass Westport Municipal Airport's service area. The population of the two counties has changed little over the last 25 years, growing only 9% from 1980 to 2005, a period in which the population of the state grew 51%.

Table 2C, Grays Harbor and Pacific County Population History

Year	Grays Harbor County	Pacific County	Total
1980	66,314	17,237	83,551
1985	63,870	17,764	81,634
1990	64,175	18,882	83,057
1995	67,880	20,496	88,376
2000	67,194	20,984	88,178
2005	70,064	20,957	91,021
Average Annual Growth Rate 1980-2005	0.22%	0.78%	0.34%

Source: State of Washington Office of Financial Management

The State of Washington prepared low, intermediate, and high projections of population by county that were released January 2002. Since then, the state has tracked how actual (estimated) populations compared with the projections. From 2000 through 2005, Grays Harbor County growth was in line with the high projection, while Pacific County's population growth was close to the intermediate projection. State population projections, using the high projection for Grays Harbor County and the intermediate projection for Pacific County, appear in **Table 2D**.

Table 2D, Grays Harbor and Pacific County Population Projections

Year	Grays Harbor County	Pacific County	Total
2010	74,216	21,257	95,473
2015	79,027	21,725	100,752
2020	83,931	22,228	106,159
2025	88,763	22,678	111,441
Average Annual Growth Rate 2005-2025	1.19%	0.40%	1.02%

Source: State of Washington Office of Financial Management, High Projection for Grays Harbor County, Intermediate Projection for Pacific County, Projections Released January 2002

According to *Comprehensive Economic Development Strategy for the Columbia-Pacific Region (June 2005)*, the region is beginning to emerge from decades of economic devastation. Natural resources—forest products, fishing and related aquaculture, agriculture, and food products—comprise the most important economic sector of the region. Timber harvests have decreased dramatically since the 1970s and fishing began declining in the 1980s, although there have been slight increases in recent years. In the ten years between 1979 and 1989, the regional average household income dropped from 91% to 79% of the state average. Some natural resource economies have improved in recent years. Second and third growth timber is becoming available at the southern end of the Olympic Peninsula and value-added wood manufacturing businesses are starting up. Fishing has improved slightly, and the value of agricultural products has increased. Diversification has helped the economic recovery. High-tech industry has been growing, due to the availability of broadband through the region. Tourism has experienced strong growth in recent years. The number of retirees and associated health-related support business and leisure activities has also been growing.

In Grays Harbor County over the last ten years, the labor force grew nearly 15% and the unemployment rate declined from nearly 13% to 8%. From 2003 to 2004, tourism increased 10% and retail sales increased 20%. Coastal communities are growing rapidly in Westport and Ocean Shores.

Westport Shipyard is one of the top employers in Grays Harbor County, with about 500 full time employees. Westport Shipyard is the country's largest yacht builder. Westport Shipyard recently upgraded its facilities in Westport to enable building fiberglass hull yachts up to 150 feet. The Port of Grays Harbor and the City of Westport are implementing the $2.5 million Phase II project of the Marina Master Plan, which is improving downtown and marina infrastructure. Sierra Pacific recently built a $45 million mill in the county, another positive development for the local economy.

The County advertises it has a pro-growth attitude, aggressive banks, reasonably priced land and construction costs, low development costs, tax incentives for new industries, and it is not fully planning under the Growth Management Act.

The population in Westport Municipal Airport's service area is projected to grow at a higher rate than the growth in Grays Harbor and Pacific County. From 2000 through 2005, the City of Westport's population grew at an annual rate of 1.53%, nearly twice the growth rate of Grays Harbor County. The City's population projections through 2025 are shown in **Table 2E**.

Table 2E, City of Westport Population Projections

Year	Population
2005 (estimated)	2,305
2010	2,589
2015	2,899
2020	3,215
2025	3,527
Average Annual Growth Rate 2005-2025	2.15%

Source: City of Westport Facilities Planning Study, 2006

The Westport area is embarking on an economic upswing that will likely fuel aviation activity. Westport has long been a tourist destination, but the resort and second home market is booming. The Links at Half Moon Bay is a luxury golf resort planned for 350 acres northwest of the Airport. Increases in seasonal residents and visitors to Westport will result from the golf resort and from other developments planned in the near-term future:

Development	Units
Links at Half Moon Bay	600
Islander	48
Lighthouse	25
Westport by the Sea (expansion)	100
Cohassett Park	63
Harbor Point	25
Total New Units	861

Source: Windermere Real Estate

Most of the new residential units are "high-end" and will be owned or leased by persons with income higher than the City's average. High per capita income usually correlates with a greater propensity to own an aircraft and more general aviation activity. In addition, the resort, conference center, and vacation homes will likely generate trips in private or chartered aircraft to reduce travel time.

WESTPORT MUNICIPAL AIRPORT FORECASTS

Westport Municipal Airport currently has unmet demand. In 2005, a developer approached the City about developing at the Airport, starting with five or six hangars and growing to the establishment of an FBO. The City is waiting for completion of this Airport Layout Plan before committing to the developer. At the initial public meeting for the Airport Layout Plan, two persons expressed interest in having a hangar at the Airport, one for an A&P (Airframe and Powerplant) maintenance business. Three others have also expressed interest in having a hangar at the Airport: one is a resident of Grayland, another is a Westport real estate agent and helicopter

pilot who wants to lease a helicopter and use it to transport potential buyers of real estate in Westport, and the third is the owner of a condo at Westport by the Sea, whose primary residence is in the Seattle area. Although the Airport's tiedown apron is available for aircraft parking, it is only used by transient aircraft for short-term parking. Aircraft owners want hangars to protect their valuable property from theft, vandalism and potential damage from rain, wind, and saltwater corrosion.

Since the Airport is unattended and no traffic count surveys have been conducted, the actual number of aircraft operations can only be estimated from anecdotal accounts. Currently, there are no fly-ins or other events that account for a surge of airport activity. Summer is the peak season for aviation activity and Airport users have reported seeing as many as six or seven airplanes parked on the apron at one time during the summer.

The fact that fuel cannot be purchased at the Airport may discourage some transient aircraft. More likely, the short, narrow runway and occasional strong crosswinds discourage pilots, particularly the less experienced. In addition, the runway is too short for many high performance aircraft, although a Citation jet and King Air 90 and 200-series turboprops are reported to have used the Airport.[2] As recently as April, 2006, the City was contacted about the feasibility of landing a Citation jet, chartered for deep sea fishing. Westport Shipyard would like to use its recently acquired King Air C90B turboprop at the Airport, but reports that the runway is too short.

Westport Shipyard has accounted for a large portion of the Airport's transient aircraft operations with its Piper Aztec twin engine piston aircraft. Westport Shipyard bases their aircraft in Port Angeles, which is the site of another boat production facility. Shipyard personnel have estimated they make between two and five trips to Westport per week (equal to between 200 and 500 annual operations). On some of their flights in the Aztec, they were transporting customers. Some yacht customers own their own aircraft and land at Bowerman Field, which can accommodate corporate jets on its 5,000-foot runway. Shipyard personnel estimate their Westport facility produces 10 boats per year and that each boat owner makes six trips to see the boat; consequently, the customers of Westport Shipyard alone could account for 120 annual aircraft operations. Eliminating the need for customers to be driven 45 minutes from Bowerman Field to the City of Westport is important to Westport Shipyard.

[2] The length of runway needed for takeoff and landing is not always the same for a particular model of aircraft because it depends on several variables, including the outside temperature and how loaded the aircraft is.

Based Aircraft Forecast

Considering the evidence of unmet demand presented above, the based aircraft forecast for Westport Municipal Airport assumes the construction of six hangars, adding six based aircraft by the year 2008. After 2008, based aircraft are projected to grow at the same rate as Westport's population, 2.15% per year. By the end of the 20-year forecast period, 12 aircraft are expected to be based at the Airport. The current based aircraft fleet is 100% single engine piston. As described in the previous section, a helicopter may be based at the airport in the near future. It is reasonable to expect a multiengine piston aircraft to be based at the airport, such as the Beechcraft Travel Air that is owned by the interested hangar developer. **Table 2F** presents the based aircraft forecast for the Airport.

Table 2F, Based Aircraft Forecast

Year	Single Engine Piston	Multi-Engine Piston	Rotorcraft	Total
2006 (Actual)	2	0	0	2
2011	7	1	1	9
2016	8	1	1	10
2026	10	1	1	12

Source: W&H Pacific, 2006

Aircraft Operations Forecasts

As shown in Table 2A, the reported number of annual aircraft operations is 11,400. This equates to, on average, more than 15 aircraft landings per day. This number of operations is probably overestimated. One of the metrics used to measure airport activity is the ratio of annual operations to based aircraft. According to the data in Table 2A, the ratio of operations per based aircraft is 3,800 (11,400 operations divided by 3 aircraft). General aviation airports with high ratios of operations per based aircraft are those with an unusually large amount of transient aircraft traffic, flight schools, or certain types of high-volume commercial aviation, such as agricultural spraying. None of these scenarios is applicable to Westport. *FAA Order 5090.3C* provides the following estimates to use at airports without forecast data: 250 operations per based aircraft for rural airports with little itinerant traffic, 350 operations per based aircraft for busier general aviation airports, and 450 operations per based aircraft for busy reliever airports.[3]

For the purposes of this Airport Layout Plan, annual operations for 2005, the last full year at the Airport, are estimated to be 1,000, comprised of 150 annual operations for each of the two based aircraft, 500 operations by Westport Shipyard and its customers, and 200 operations (two aircraft per week on average) by other transient aircraft. In the forecast of aircraft operations presented in **Table 2G**, the ratio of 500 operations per based aircraft is used for the first forecast year and then increased 1.2% each year to reflect increased usage of individual aircraft, consistent with the

[3] Reliever airports are outlying airports in metropolitan areas that relieve the traffic demand on busy commercial service airports by accommodating general aviation aircraft traffic.

FAA national forecast for hours flown. By 2026, the projected ratio of operations per based aircraft is 635.

Table 2G also divides the aircraft operations into the categories of air taxi, GA local and GA itinerant. The Airport Master Record (FAA Form 5010) shows that the estimated 11,400 annual operations are divided as follows: 13% air taxi, 19% GA local, and 68% GA itinerant. There currently are no, or very few, air taxi operations, although there may have been an air taxi business at the Airport in the past. It is likely that the resort development planned for Westport and the growth expected in air taxi businesses nationwide portend a return of air taxi operations to the Airport. It is likely that there will continue to be fewer local operations than itinerant operations, unless flight instruction starts at the Airport. Table 2G assumes the future composition of aircraft operations will be 10% air taxi, 20% GA local, and 70% GA itinerant.

Table 2G, Aircraft Operations Forecast

Year	Air Taxi	GA Local	GA Itinerant	Total
2005 (est.)	0	200	800	1,000
2011	450	900	3,150	4,500
2016	530	1,060	3,710	5,300
2026	740	1,480	5,180	7,400

Source: W&H Pacific, 2006

Table 2H presents the forecast for operational fleet mix. Higher performance turboprop and turbojet aircraft and helicopters are projected to account for increasing proportions of airport traffic, consistent with the national trend.

Table 2H, Operational Fleet Mix Forecast

Year	Single Engine Piston	Multi-Engine Piston	Turboprop	Turbojet	Rotorcraft
2005 (est.)	50%	50%	0%	0%	0%
2011	66%	18%	12%	1%	3%
2016	63%	18%	13%	2%	4%
2026	60%	18%	14%	3%	5%

Another component of an airport forecast is the number of instrument approaches. The Airport does not have an instrument approach now and it has not been determined if one is feasible or desirable. According to information in the Washington Aviation System Plan, instrument weather occurs approximately 13% of the time west of the Cascades. Air taxi and corporate aircraft fly by IFR (Instrument Flight Rules) all the time, regardless of the weather. Many GA pilots are not instrument-rated. Consistent with the State Aviation System Plan, if Westport were to have an instrument approach, 46.1% of GA aircraft approaches would be assumed to be instrument approaches.

CRITICAL AIRCRAFT AND AIRPORT REFERENCE CODE

An airport is designed based on the characteristics of the most demanding aircraft, or critical aircraft, which uses the airport regularly. According to FAA criteria, regular use is defined as at least 500 annual itinerant operations. Until last fall, the most demanding aircraft using Westport Municipal Airport on a regular basis was Westport Shipyard's Piper Aztec PA-23-250 (ARC B-I (small)), a light twin engine piston aircraft, accounting for 500 annual operations. In September 2005, Westport Shipyard purchased a turboprop King Air C90B to replace the Aztec and would like to use it at Westport Municipal Airport, but the runway is too short. The Shipyard estimates up to 500 annual operations if the runway were adequate for the King Air. According to the operations and fleet mix forecasts in Tables 2G and 2H, by 2011 the Airport will have 540 annual operations in turboprop aircraft, which exceeds the 500 operations threshold for regular use. The King Air C90B is the critical aircraft for airport design.

The Airport Reference Code (ARC) is the main criterion for determining applicable FAA airport design standards. The ARC is defined by the Aircraft Approach Category and the Airplane Design Group of the critical aircraft. The Aircraft Approach Category is determined by the approach speed, or 1.3 times the stall speed of the aircraft in its landing configuration at its maximum landing weight. The Aircraft Approach Category is represented by the letters A, B, C, D and E. The Airplane Design Group of the aircraft is based on the wingspan and is defined by Roman numerals I, II, III, IV, V and VI.

The King Air C90B has an approach speed of 100 knots, wingspan of 50 feet 3 inches, and maximum takeoff weight of 10,100 pounds. This means that the ARC for the aircraft is B-II and its weight (not more than 12,500 pounds maximum takeoff weight) categorizes the aircraft as "small," which is another important criterion for airport design.

Most of the other aircraft that use the Airport now have wingspans less than 49 feet, which places them in Airplane Design Group I. Because of the physical and environmental constraints at the airport, the City, in consultation with WSDOT Aviation, may decide not to plan to meet the FAA standards for ARC B-II. For this reason, the FAA standards for both Airplane Design Groups I and II will be analyzed in the next chapter.

Chapter Three
AIRPORT FACILITY REQUIREMENTS

INTRODUCTION

In this chapter, existing airport facilities are evaluated to identify their condition, functionality, compliance with design standards and State performance criteria, and capacity to accommodate the demand projected in Chapter Two.

The objective of this effort is to identify, in general terms, the adequacy of the existing airport facilities, outline what new facilities may be needed, and when these may be needed. Having established these facility requirements, alternatives for providing these facilities will be created. Due to the physical and environmental constraints at Westport Municipal Airport, it may not be financially or environmentally feasible to accommodate all of the required facilities at the existing airport site, therefore the alternatives will address different levels of facility development.

PLANNING MILESTONES

Cost-effective, safe, efficient, and orderly development of an airport should rely more upon actual demand than on a time-based forecast. It is important to consider that the actual activity at an airport may be higher or lower than what the annualized forecast portrays. In order to develop a plan that is demand-based rather than time-based, a series of activity milestones have been established. By planning according to these milestones, unexpected shifts, or changes, in the area's aviation demand can be accommodated. Table 3A presents the planning milestones for each aircraft activity category. The planning milestones essentially correlate to the five, ten, and twenty-year periods used in the previous chapter.

Table 3A, Aviation Demand Planning Milestones

Demand Category	Current	Short Term (2011)	Intermediate Term (2016)	Long Term (2026)
Total Operations	1,000	4,500	5,300	7,400
Local	200	900	1,060	1,480
Itinerant	800	3,150	3,710	5,180
Air Taxi	0	450	530	740
Based Aircraft	2	9	10	12

Source: W&H Pacific, 2006

AIRPORT PLANNING CRITERIA

WSDOT has adopted FAA airport design standards. The FAA specifies design standards by Airport Reference Code (ARC) and instrument approach visibility minimums. In the previous chapter, it was determined that the critical aircraft for airport design is the Beech King Air C90B, which has an ARC of B-II (small). However, the majority of aircraft that use the Airport fall into Airplane Design Group (ADG) I (small). In addition, the critical aircraft's wingspan is less than two feet larger than ADG I. Since the physical and environmental constraints of the Airport may restrict development of an ADG II facility, standards for both ADG I and II will be analyzed.

The Airport does not currently have an instrument approach and is classified as a visual runway. For determining airport design criteria, instrument approach visibility minimums are divided into three categories:

- visual and not lower than one-mile
- not lower than ¾-mile
- lower than ¾-mile

Due to Westport's location near the ocean, rain and fog are common and often reduce visibility. Consequently, the usability of the Airport is also reduced. It is therefore desirable for an instrument approach procedure to be implemented. In addition to frequent instrument weather conditions, corporate and air taxi aircraft typically fly under Instrument Flight Rules (IFR), regardless of the weather conditions. New technology allows instrument approaches using the Global Positioning System (GPS) to be implemented at a minimal cost, in terms of navigational aids and cockpit equipment. For many small general aviation airports, however, the cost of upgrading facilities to the minimum requirements for the different approach visibility categories is a significant constraint to establishing an instrument approach. This chapter presents the requirements of all the different instrument approach visibility minimums, to aid in assessing the feasibility of an instrument approach, considering the physical, environmental and funding constraints that exist at the Airport.

In addition to FAA criteria, WSDOT Aviation Division recently created general guidelines for airport development based on the roles, or classifications, of airports within the statewide system. The classifications and guidelines are only draft proposals at this time, but they still provide useful guidance for Westport. Five unique classifications were created, each with its own set of

performance criteria. The classifications were created based on factors such as access, facilities, services, expansion and preservation, and economic opportunities. The classifications are: Commercial Service, Regional, Local Community Airports, Recreation or Remote Airports, and Sea Plane Bases. Westport Municipal Airport has been classified as a Local Community Airport. Local Community Airports serve medium to small communities and local business activities. Typically, they can accommodate single- and multiengine general aviation aircraft. Local Community Airports are subdivided into two groups, those with fewer than 10 based aircraft, and those with 10 or more based aircraft. Westport Municipal Airport now has fewer than 10 based aircraft, but is projected to grow to 10 based aircraft by 2016. Table 3B shows the minimum performance criteria for Local Community Airports.

Table 3B. WSDOT Local Community Airport Performance Criteria

Facilities and Services	10 or More Based Aircraft	Fewer than 10 Based Aircraft
Passenger Service	Desirable	Desirable
Service Area Coverage	30 minutes	30 minutes
Runway Length	3,500 feet	3,000 feet desirable
Taxiway	Parallel	Turn around at each end, Parallel desirable
Runway Edge Lighting	Medium Intensity Runway Lights (MIRL)	MIRL desirable
Approach	Non-Precision Instrument	Visual
Visual Glide Slope Indicator (VGSI)	VGSI, such as Precision Approach Path Indicator (PAPI) or Visual Approach Slope Indicator (VASI)	Desirable
Wide Area Augmentation System (WAAS) for GPS Instrument Approaches	Desirable	--------
Automated Weather Reporting	Desirable in Adverse Weather Areas	--------
Fuel Sales Available	100LL	100LL desirable
Maintenance Service Available	Minor Service	Desirable
Visual Aids, rotating beacon, segmented circle and wind cone	Yes	Yes
Local Support	Yes	Yes
Operational Safety Issues	No	No
Approach area free of height obstructions	Yes	Yes

Facilities and Services	10 or More Based Aircraft	Fewer than 10 Based Aircraft
Expansion Capability	Yes	Yes
Airport Zoning	Yes	Yes
Compatible Land Use Policies & Zoning	Yes	Yes

Source: Washington Aviation System Plan, System Classification Strategy, Preliminary Draft (currently under review as part of Washington's Long-Term Air Transportation Study, begun in 2006)

AIRFIELD DESIGN STANDARDS

The FAA has established several design standards to protect aircraft operational areas and keep them free from obstructions that could affect the safe operation of aircraft. These include the runway safety area (RSA), object free area (OFA), obstacle free zone (OFZ), and runway protection zone (RPZ).

The RSA is "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 an excursion from the runway."

The OFA is an area on the ground centered on the runway or taxiway centerline provided to enhance the safety of aircraft operations. No above ground objects are allowed except for objects that need to be located in the OFA for air navigation or aircraft ground maneuvering purposes.

The OFZ is a volume of airspace that is required to be clear of objects, except for frangible items required for navigation of aircraft. It is centered along the runway and extended runway centerline.

The RPZ is defined as an area off each runway end whose purpose is to enhance the protection of people and property on the ground. The RPZ is trapezoidal in shape and centered about the extended runway centerline. The dimensions of an RPZ are a function of the runway ARC and approach visibility minimums. The FAA recommends that RPZs be clear of all residences and places of public assembly (churches, schools, hospitals, etc) and that Airports own the land within the RPZs.

In addition to the design standards discussed above, the FAA provides recommended dimensions for runway width, taxiway width, taxiway safety areas and others. Design standards are set forth in AC 150/5300-13; Table 3C compares existing dimensions to the recommended design standards for ADG I (small) and ADG II (small) based on two different categories of approaches. One category reflects dimensions based on approach visibility minimums not lower than ¾ statute mile, while the other category depicts approach visibility minimums lower than ¾ statute mile. It is important to note that while these recommendations are created by the FAA, WSDOT Aviation Division follows the same guidance criteria.

TABLE 3C, Airfield Design Standards

	Existing Dimensions	**ADG I (small)** Not lower than ¾ statute mile	**ADG I (small)** Lower than ¾ statute mile	**ADG II (small)** Not lower than ¾ statute mile	**ADG II (small)** Lower than 3/4 statute mile
Runway Width	50’	60’	75’	75’	100’
Runway Centerline to Parallel Taxiway Centerline Separation	215’	150’	200’	240’	300’
RSA					
Width	70’	120’	300’	150’	300’
Length beyond runway end (12/30)	245’/150’	240’	600’	300’	600’
OFA					
Width	70’	250’	800’	500’	800’
Length beyond runway end (12/30)	245’/240’	240’	600’	300’	600’
OFZ					
Width	70’	250’	300’	250’	300’
Length beyond runway end (12/30)	245’/240’	200’	200’	200’	200’
RPZ					
Inner Width x Outer Width x Length	250’ x 450’x 1,000’	1,000’x 1,510’x 1,700’[1/]	1,000’ x 1,750’ x 2,500’	1,000’x 1,510’x 1,700’[1/]	1,000’ x 1,750’ x 2,500’
Runway Blast Pads					
Length	0’	60’	60’	150’	150’
Width	0’	80’	95’	95’	120’
Runway Shoulder Width	10’	10’	10’	10’	10’
Taxiway Width	30’	25’	25’	35’	35’
Taxiway Safety Area Width	56’	49’	49’	79’	79’
Taxiway Object Free Area Width	56’	89’	89’	131’	131’

Source: FAA Advisory Circular 150/5300-13

[1/] Because RPZ sizes are further divided into more categories for approach visibility minimums; it is possible that the RPZ sizes can be a dimension other than the one shown in the table. For approaches with visibility minimums of one mile or more, the RPZ size would be either 250’ x 450’ x 1,000’ for runways supporting small aircraft exclusively, or 500’ x 700’ x 1,00’ for runways supporting Aircraft Approach Categories A & B.

As shown in Table 3C, several of the existing dimensions do not meet any of the recommended standards. The existing RSA is non-standard as it does not meet the width recommendations. The current RSA width of 70 feet is based on a 50-foot runway width and 10-foot graded grass shoulders on both sides of the runway. Beyond the shoulders, the terrain drops off six to seven feet to wetland areas. The RSA length beyond the Runway 12 threshold is adequate; it is flat and graded for 245 feet beyond the runway end. The RSA length beyond the Runway 30 threshold is non-standard; it is flat and graded for 150 feet at which point the terrain drops approximately six feet. To bring the existing RSA into compliance, fill will be needed along both sides of the runway for its entire length, and beyond the Runway 30 end, unless declared distances[1], which will reduce the useable runway length are employed.

Similar to the RSA, the existing OFA is also non-standard. The width of the OFA is 70 feet and should be 250 feet. There are several objects that are penetrating its surface: near the Runway 12 threshold, trees and brush are located approximately 35 feet from both sides of the runway centerline, the wind cone is located two to three feet inside of the OFA, and near the Runway 30 threshold a nearby homeowner's fence is located within the OFA. The OFA lengths beyond both runway ends are adequate, however because the width is non-standard, the entire OFA is non-standard. In order to bring the OFA into compliance, the objects that are currently penetrating its surface need to be removed.

The Taxiway Object Free Area (TOFA) does not meet recommended standards. The TOFAs recommended width is 89 feet. It is currently non-standard due to the trees/bushes located 28 feet west of the taxiway centerline. The fence surrounding the apron area is also located within the TOFA. These objects should be removed from the TOFA to comply with standards.

AIRFIELD REQUIREMENTS

As discussed in Chapter One, airfield facilities are those that are related to the arrival, departure, and ground movement of aircraft. Airfield facility requirements are addressed for the following areas:

- Airfield Capacity
- Runway Orientation, Length, Width, and Strength
- Taxiways
- Lighting, Marking, and Signage
- Navigational and Approach Aids

Airfield Capacity

A demand/capacity analysis measures the capacity of the airfield configuration by determining its Annual Service Volume (ASV). ASV is an estimate of an Airport's maximum annual capacity based on factors such as aircraft mix, weather conditions, and others. FAA Advisory Circular 150/5060-5, *Airport Capacity and Delay*, provides guidance on determining ASV.

[1] Declared distances are the distances the airport owner declares available for the airplane's takeoff run, takeoff distance, accelerate-stop distance, and landing distance requirements.

Annual capacity of a single runway configuration with a parallel taxiway is approximately 230,000 operations. Since Westport Municipal Airport does not have a full length parallel taxiway available, its ASV is estimated to be 30% less, or 161,000 aircraft operations. The forecasts project annual operations of 7,400 by 2026, remaining well below the capacity of the existing airfield system.

Runway Orientation

For the operational safety and efficiency of an airport, it is desirable for the primary runway to be oriented as close as possible to the direction of the prevailing wind. This reduces the impact of crosswind components during landing or takeoff.

The FAA recommends providing a crosswind runway when the primary runway configuration provides less than 95 percent wind coverage at specific crosswind components. The 95 percent wind coverage is computed on the basis of crosswinds not exceeding 10.5 knots for aircraft in Airplane Design Group I or 13 knots for aircraft in Airplane Design Group II.

Westport Municipal Airport has a single runway oriented northwest-southeast (Runway 12-30). Wind coverage data is unavailable for Westport; however, wind coverage at nearby airports has been analyzed. Bowerman Field in Hoquiam has a runway heading of 6-24 and is reporting wind coverage of 94.59% at a 10.5 knot crosswind component and 97.24% at a 13 knot crosswind component. Wind roses from Bowerman Field indicate that its runway is aligned for the greatest wind coverage. Hogan's Corner Airport, located four miles north of Ocean Shores, is a private airfield whose runway is also oriented on a heading of 6-24. Both of these airports' runways are oriented nearly perpendicular to Westport Municipal Airport and are aligned for the best wind coverage. Ocean Shores Municipal Airport has a runway heading of 15-33, more north-south similar to Westport, and is assumed to be less than the 95% recommended coverage. Based on this data, it can be concluded that Westport Municipal Airport may not meet the FAA's recommended 95% wind coverage; therefore, consideration should be given to construction of a crosswind runway. The City of Westport could conduct a wind survey to obtain information on wind direction/strength to help determine the appropriate runway orientation. In the past, the FAA recommended increasing the width of the runway to the next highest ARC for runways that do not meet the recommended wind coverage, when the provision of a crosswind runway is infeasible due to severe terrain constraints. [2]

Runway Length

Runway length requirements for an airport are based on several factors such as airport elevation, mean maximum temperature of the hottest month, runway gradient, airplane operating weights, runway surface conditions (i.e., wet or dry), and others. FAA Advisory Circular 150/5325-4B, *Runway Length Requirements for Airport Design*, as well as the FAA's Airport Design Computer Program was consulted for guidance on recommended runway lengths at Westport.

[2] FAA Advisory Circular 150/5300-13, *Airport Design,* Appendix 1. In this case, the width of the runway is the only design standard that would be upgraded to the next highest ARC. All other dimensional standards would remain unchanged.

Both the Advisory Circular and the computer program classify aircraft based on weight. For "small" airplanes (those weighing no more than 12,500 pounds), the classifications are further divided into two additional categories - small airplanes with fewer than 10 passenger seats and small airplanes with 10 or more passenger seats. The computer program, using site-specific data, reflects runway length recommendations by grouping general aviation aircraft into several categories, reflecting the percentage of the fleet within each category. Table 3D summarizes FAA's generalized recommended runway lengths for Westport Municipal Airport.

Table 3D, Runway Length Requirements

Airport and Runway Data	
Airport elevation	14 feet
Mean daily maximum temperature of the hottest month	68° F
Maximum difference in runway centerline elevation	0 feet
Wet and slippery runways	
Runway Lengths Recommended for Airport Design	
Small airplanes with less than 10 passenger seats	
To accommodate 75 percent of these small airplanes	2,280 feet
To accommodate 95 percent of these small airplanes	2,820 feet
To accommodate 100 percent of these small airplanes	3,340 feet
Small airplanes with 10 or more passenger seats	3,880 feet

Source: FAA's Airport Design Computer Program, Version 4.2D, AC 150/5325-4B, Runway Length Requirements for Airport Design

The current runway length of 2,317 feet accommodates slightly more than 75% of the small aircraft fleet with fewer than 10 passenger seats. It is better for a runway to accommodate 95% to 100% of the family of aircraft it is designed for. In addition, Airport users have expressed the need for additional runway length, particularly to accommodate the critical aircraft - Westport Shipyard's Beech King Air C90B. The runway length required for takeoff by this aircraft at Westport, is 2,832 feet[3]. The Shipyard has expressed preference for a runway length between 3,000 and 3,600 feet.[4]

Runway Width

The current runway width of 50 feet is non-standard. The minimum recommended runway width is 60 feet for an ARC of A-I (small) and as shown in Table 3B, could range between 60 feet and 100 feet, depending on the ARC and approach visibility minimum.

[3] King Air C90B performance specifications state the runway length needed in standard conditions (sea level and 59 degrees) is 2,710 feet. FAA Central Region guidance states that the runway length required for standard conditions should be increased 0.5% for each degree above the standard temperature in the hottest month and 7% for every 1000' above sea level.

[4] After this facility requirements analysis was completed, Westport Shipyard indicated that the minimum runway length required for the King Air C90B's insurance coverage is 3,400 feet.

Runway Pavement Strength

The most important feature of airfield pavement is its ability to withstand repeated use by the most weight-demanding aircraft that operates at an airport. The pavement strength rating of Runway 12-30 is unknown; however the pavement was slurry sealed in 2003 and is in good condition. When a new runway for "small" aircraft is constructed to WSDOT/FAA standards, it is constructed to a pavement strength rating of 12,500 pounds. This strength rating ensures adequate pavement wear and decreases the frequency of short-term pavement maintenance needs.

Taxiways

Taxiways are constructed primarily to facilitate aircraft movements to and from the runway environment. Some taxiways are necessary simply to provide access between the aprons and the runways, whereas other taxiways become necessary to provide safe and efficient use of the airfield as airport activity increases.

At Westport Municipal Airport, a partial parallel taxiway is located on the southeast side of the apron. Because this taxiway does not span the entire runway length, aircraft are required to back taxi in order to takeoff and may need to back taxi after landing. Constructing a full length parallel taxiway would eliminate the need to back taxi and would provide a safer, more efficient traffic flow. In addition, a parallel taxiway is recommended for non-precision instrument approaches with visibility minimums one mile or more and is required for instrument approaches with visibility minimums lower than one mile.

Similar to runway width, taxiway width is also determined by the ADG of the most demanding aircraft to use the taxiway. The existing taxiways at the Airport are 30 feet wide. This width exceeds the ADG I recommendation of 25 feet, but falls short of the ADG II recommendation of 35 feet.

Runway centerline to parallel taxiway centerline separation distance is another important criterion to examine. The recommended distance is based on satisfying the requirement that no part of an aircraft on a taxiway or taxilane centerline is within the runway safety area or penetrates the obstacle free zone (OFZ). The current distance between the Runway 12-30 centerline and the partial parallel taxiway centerline is 215 feet, which exceeds the 150-foot standard for ADG I. Similar to runway width, the separation distance between a runway and parallel taxiway can vary significantly depending on the ARC and the type of approach available. At Westport, this separation distance could range between 150 feet and 300 feet, as shown in Table 3B.

Navigational and Approach Aids

Visual Approach Aids. As discussed in Chapter One, the Airport has two-box VASIs on both runway ends, however, due to vandalism, they are both inoperable. It is recommended that the Airport repair the existing VASIs or install Precision Approach Path Indicators (PAPIs). WSDOT recommends visual glide slope indicators, such as PAPIs or VASIs at Local

Community Airports. PAPIs are similar to VASIs in that they assist a pilot by providing visual glide slope information when landing at the Airport, however the light units are configured differently (single row versus bars).

Instrument Approach Aids. There are currently no instrument approach aids available at the Airport, although some users report using Bowerman Field instrument approach aids when landing at Westport Airport in low visibility conditions. The advent of Global Positioning System (GPS) technology can ultimately provide the airport with the capability of establishing new instrument approaches at minimal cost since there is not a requirement for the installation and maintenance of costly ground-based transmission equipment at the airport.

The FAA is proceeding with a program to transition from existing ground-based navigational aids to a satellite-based navigation system utilizing GPS technology. The FAA commissioned the Wide Area Augmentation System (WAAS) in July 2003. WAAS refines GPS guidance for enroute navigation and approaches. General aviation, corporate, air taxi, and regional airline operators are expected to benefit from this augmentation to GPS signals. The FAA is certifying new approaches at the current rate of about 300 per year, nationally.

GPS approaches fit into three categories, each based upon the desired visibility minimum of the approach. The three categories of GPS approaches are: precision, non-precision with vertical guidance, and non-precision. To be eligible for a GPS approach, the airport landing surface must meet specific standards as outlined in FAA AC 150/5300-13, *Airport Design*. The FAA requires that airports having a non-precision GPS approach must have a minimum runway length of 3,200 feet. *Airport Design* states that airports having runways as short as 2,400 feet could support an instrument approach if the lowest Height Above Touchdown (HAT) is based on clearing a 200-foot obstacle within the final approach segment. At this time there are no surveyed obstruction data to identify obstacles that might affect an instrument approach to Westport. Additional survey data would be needed for the FAA Flight Procedures Office to analyze before they could design an instrument approach for the Airport and determine if a runway shorter than 3,200 feet could support an instrument approach.

Other NAVAIDS. There is currently a lighted wind cone and segmented circle located between the runway and the taxiway. It is also recommended that a rotating beacon be installed to assist pilots in locating the airport at night or in low visibility conditions.

Airfield Lighting, Signing, and Marking

Airports commonly include a variety of lighting, signage, and pavement markings to assist pilots using the airport.

Runway and Taxiway Lighting. Airport lighting systems provide critical guidance to pilots during nighttime and low visibility operations. Runway 12-30 is equipped with medium intensity runway lighting (MIRL). It is recommended that this system be maintained throughout the planning period.

Effective ground movement of aircraft at night is enhanced by the availability of taxiway

lighting. There is currently no taxiway lighting system at the Airport. Taxiway lighting is not required and a system of edge reflectors may be adequate. If a full length parallel taxiway is constructed, a taxiway lighting system could be considered, particularly if an instrument approach is implemented, although it is not required.

Visual Approach Lighting. Runway identification lighting provides the pilot with a rapid and positive identification of the runway end. The most basic system involves runway end identifier lights (REILs). Currently, there are no REILs installed at Westport. REILs have been identified by the Airport as a desired future improvement, particularly because of frequent low visibility conditions which make it hard to locate the runway ends. In addition, if a night time instrument approach procedure is implemented, REILS would aid pilots in locating the runway ends quickly. It is recommended that REILs be installed at both runway ends.

Pilot-Controlled Lighting. Westport Municipal Airport is not equipped with pilot-controlled lighting (PCL). PCL allows pilots to turn runway lighting on and control its intensity using the radio transmitter in their aircraft. Currently the runway edge lights are left on from dusk until dawn. Installing a PCL system at the Airport will reduce electricity bills and will give the pilot greater flexibility in controlling the lighting system at the Airport.

Airfield Signage. The airport currently has one non-lighted hold sign on the south connector taxiway. The purpose of a hold sign is to notify the pilot of an entrance to a runway. Hold signs should be located on taxiways wherever they intersect with runways. Hold signs display the runway end number(s) and generally correlate with hold markings located on taxiway pavement. Aircraft should not proceed past these signs and/or markings until the runway is clear. Hold signs should be installed on any future connector taxiways. Lighted hold signs are not required, however they are helpful and could be considered when installing hold signs.

Distance-to-Go signs should also be installed on the runway. These signs are located at 1,000-foot intervals along the runway edge and they provide pilots with runway distance remaining information.

Pavement Markings. Runway markings are designed according to the type of instrument approach available on the runway. FAA Advisory Circular 150/5340-1J, *Standards for Airport Markings*, provides the guidance necessary to design airport markings. Basic (visual) markings are currently in place on Runway 12-30. If the Airport implements a non-precision approach, the runway markings will need to be upgraded to non-precision markings.

There are no hold markings on the taxiways adjoining the runways. It is recommended that hold markings be painted on taxiways connecting to the runway so that aircraft waiting for arriving or departing aircraft to clear the runway are not in the RSA.

Weather Reporting

Westport Shipyard has expressed interest in the airport having a weather reporting device, particularly something that will provide wind information. If an instrument approach is implemented, an approved altimeter reporting source will also be needed. The Airport could

install an Automated Weather Observation System (AWOS) or a SuperUnicom, both have been approved by the FAA. An AWOS consists of a sensor located on top of a tower that provides automatic recordings of cloud heights, visibility, wind speed, wind direction, temperature, dew point, and altimeter setting. An AWOS requires a 500-foot critical radius in which buildings taller than a specified height can not be located. A SuperUnicom (also known as a SuperAWOS) will provide both wind and altimeter information. A SuperUnicom is a small box that is typically co-located with an Airport's windcone. The device does not have the height restrictions that a traditional AWOS carries, and the installation costs are significantly less.

A representative of the Coast Guard Air Station at Astoria has also stated that weather reporting and an instrument approach at Westport Municipal Airport would be helpful to their flights landing at Westport Coast Guard Air Station; their aircraft currently uses Bowerman Field in Hoquiam for weather reporting and instrument approach NAVAIDS.

Helicopter Facilities

There are currently no helicopter facilities at the Airport. Helicopters are used regionally for logging, medical evacuation, firefighting, sightseeing, and other uses. It is expected that these types of activities will continue to grow throughout the planning period. Chapter Two projects one helicopter will be based at the Airport in the future: one individual in Westport who is interested in leasing a helicopter to use for business purposes.

The Coast Guard also uses helicopters for patrols, search and rescue missions, and other marine activities. A helipad is located at the Westport Coast Guard Station, however if additional facilities (such as fueling) were available at the Airport, the Coast Guard might use the Airport.

Planning for future improvement projects at Westport Municipal Airport should consider reserving space for helicopter facilities.

LANDSIDE REQUIREMENTS

Landside facilities are those facilities necessary for handling aircraft while on the ground, and those facilities which provide an interface between the air and ground transportation modes. Landside requirements are addressed for the following facilities:

- Airport Buildings (Hangars, Pilot Lounge)
- Aprons and Aircraft Parking
- Aviation Services
- Airport Access and Vehicle Parking

Airport Buildings

The most common buildings at an airport are hangars. The use of hangars for aircraft storage instead of tiedown apron parking depends on the local climate, security, and owner preferences. The trend in general aviation aircraft is toward higher performance, higher value aircraft. Therefore, many aircraft owners prefer enclosed hangar space to outside tiedowns. At Westport

Municipal Airport, hangars are a more desirable option because of weather conditions and corrosion caused by salt spray. There is currently one hangar building located on Airport property. There are also two hangars that are located on private property and access the Airport with a through-the-fence agreement with the City. One building accesses the Airport from the tiedown ramp, while the other hangar accesses the Airport via a turf taxiway connecting to the partial parallel taxiway.

The demand for aircraft hangars is dependent upon the number and type of aircraft expected to be based at the airport in the future. Hangar development should be based upon actual demand trends and financial investment conditions, not solely on forecasts. At Westport Municipal Airport all based aircraft are currently stored in hangars. In the future, it is expected that this ratio will remain the same, creating a need for 12 hangar spaces by 2026. Table 3E summarizes the hangar development needs for each milestone year.

TABLE 3E, Landside Facility Needs

	Current	2011	2016	2026
Based Aircraft	2	9	10	12
Hangar Units[1/]	3[1/]	9	10	12
Total Tie-Downs	14	7	7	7
Based Aircraft Tiedowns		0	0	0
Transient Aircraft Tiedowns		7	7	7

Source: W&H Pacific, 2006
Note: [1/] Includes two through-the-fence operators' hangars

The City has been approached by a hangar developer who is interested in constructing five or six T-hangars and eventually an FBO building and more hangars at the Airport.

Hangar facilities at an airport typically consist of some combination of T-hangars and conventional/private hangars. T-hangars typically store one aircraft in one unit, while conventional/private hangars can store more than one aircraft in one large enclosed structure.

There are currently no other buildings located at the Airport, but there is a portable latrine. Considering the projected increase in air traffic, it is recommended that the Airport consider constructing a pilot's lounge/flight planning building with restrooms and telephone service to allow Airport users a place to check weather, file flight plans, and rest. This facility could be operated by an FBO or the City and could serve as the "welcome center" for visitors arriving to Westport via airplane

Aprons and Aircraft Parking

The existing apron has 14 tiedown positions. There are no based aircraft parked at the tiedowns; they are generally used only by transient aircraft. It is expected that this practice will remain the same throughout the planning period.

The FAA has developed an approach for determining the number of tiedowns needed for itinerant aircraft operating at an airport. The following methodology was taken from Appendix 5 of FAA Advisory Circular 150/5300-13, *Airport Design*, and is based on peak operations calculations:

1. Total annual operations (from Chapter Two)
2. Multiplied by 50 percent (50 percent of annual operations are departures)
3. Divided by 12 (Number of departures per month in a one year period)
4. Divided by 30 (Number of departures per day, based on 30 day month)
5. Reduced by 50 percent to account for aircraft that do not remain at the Airport.

Using this methodology, the Airport will need to have transient tiedown space for five aircraft by 2026. Discussions with the Airport and airport users have revealed that as many as six aircraft have been tied down during the summer months. To be conservative, it is recommended that the Airport maintain half of the existing tiedown positions (seven) to accommodate transient aircraft, including at least one space large enough for a transient ADG II aircraft. Table 3E depicts the tiedown needs throughout the planning period. The area occupied by the remaining tiedown positions could be used for additional hangar buildings, a fueling facility, or some other type of aviation service.

Aviation Services

As discussed in Chapter One, there are no aviation services or FBOs currently available at the Airport. The forecast chapter documented an individual who is interested in starting an aircraft maintenance shop at the Airport. Based on this interest and the increased traffic demand projected to occur, it is recommended that space be reserved for a future aviation service provider. As previously mentioned, the hangar developer who has approached the City included an FBO building in the initial conceptual layout. A specific size of building or types of services to be provided has not been defined.

Airport Access and Vehicle Parking

The existing access to the Airport, via Montesano Street, is adequate. No changes are recommended.

Vehicle parking at the Airport is adequate. The current lot is 900 square yards paved, and can accommodate approximately 15-20 vehicles. If demand warrants, the Airport should consider marking the parking lot to provide designated parking spaces.

Future hangar development may require the construction of more access roads.

SUPPORT FACILITY REQUIREMENTS

Various facilities that do not logically fall within the classifications of airfield or landside have been categorized as Support Facilities. The following components were evaluated to determine the need for future improvements:

- Emergency Services
- Airport Maintenance
- Airport Fencing
- Utilities
- Aviation Fuel Facility
- Other Facilities

Emergency Services

Emergency services are currently provided by City of Westport Fire and Police Departments. These services are adequate for the planning period.

Airport Maintenance

Airport maintenance is provided by the City of Westport Streets Department and supplemented by prison workers from nearby Cedar Creek Prison. No changes are recommended.

Airport Fencing

A four-foot high chain-link fence surrounds the tie-down apron. There is a pedestrian gate located in the parking lot which provides direct access to the apron. Other areas of the Airport are unfenced. The Airport has had trouble in the past with vandalism to navigational aids. While fencing is not required, it is recommended that the entire Airport perimeter be fenced, particularly to deter vandalism and to keep dogs, children, and wildlife off the airfield. Typically either six or eight-foot chain link fencing with three strand barbed wire is used. In addition, there may be a need to install automated vehicle access gates to secure the airfield and hangar areas, while still allowing airport users easy access to the airport facilities.

Utilities

Utilities available at the Airport include electricity, provided by the Grays Harbor County Public Utility District Number 1, and water and sewer, provided by the City. These services are adequate through the planning period. However, if a pilot's lounge is constructed, telephone service should be available for filing flight plans and receiving weather briefings.

Aviation Fuel Facility

Fuel is not available for sale at the Airport now. Bowerman Field in Hoquiam is the closest airport where aviation gasoline and jet fuel are sold. Transient aircraft might make more use of the airport and the airport would be more attractive to based aircraft if fuel were available for sale. For some GA airport sponsors, the major source of revenue at an airport is profit from selling fuel. Even when not the fuel vendor, airport sponsors derive revenue from fuel flowage fees imposed on vendors. The first entry into fuel sales for a small GA airport is usually a self-service facility for aviation gasoline, and space for a self-service fueling facility should be planned at Westport for the near-term future. However, a minimum level of aircraft activity is

required to justify the capital and operating/maintenance investment required for a fueling facility. The investment should not be made until there is a substantial increase in hangars, based aircraft, and transient aircraft. If land is allotted for a full-service FBO, fuel truck and fuel tank storage areas could be part of the FBO land requirement.

Other Facilities

A nearby resident has expressed interest in developing an airpark on the southeast side of the Airport. The FAA and WSDOT Aviation Division highly discourage airparks; therefore, the development of this type of facility would need to be funded privately. In addition it is likely not feasible to develop an airpark near the Airport due to the high value of wetlands in the surrounding area. Any environmental costs associated with a project of this type would also need to be privately funded. For these reasons, it is recommended that the City of Westport does not pursue the development of an airpark.

RATES & CHARGES

The City of Westport receives approximately $1,200 per year from a ground lease for the one on-airport hangar building. There are no tiedown fees or landing fees imposed on users. It is recommended that the City charge a fee to the two through-the-fence operators for providing direct access to the runway. The FAA and WSDOT highly discourage through-the-fence operations and expect that airports treat all users fairly with regard to fees charged.

LAND USE PLANNING & ZONING RECOMMENDATIONS

There are several items that the City of Westport should work towards with regard to land use and zoning around the Airport. Recommendations are provided below. The Capital Improvement Plan (CIP) (included in Chapter Five) will provide a cost estimate to implement these recommendations.

Zoning Code:

- Rezone the Airport property as “Airport” to ensure that only compatible uses are occurring within the Airport property boundary. Alternatively, the property could be zoned as “Industrial”, which would help limit incompatible uses.
- Specify height limitations within each zoning designation throughout entire zoning code.

Comprehensive Plan:

- Adopt the final Airport Layout Plan, by reference, into the City of Westport’s Comprehensive Plan.
- Insert a description of Westport Municipal Airport and its facilities (i.e., runway dimensions, runway orientation, number of hangars, aviation activity levels).
- Insert a summary of planned improvements identified in the Airport Layout Plan to the transportation inventory section.
- Identify Westport Municipal Airport as an Essential Public Facility.

- Adopt a title notice or similar requirement to inform purchasers of property within one mile of the Airport that their property is located adjacent to or in close proximity to Westport Municipal Airport and that their property may be impacted by a variety of aviation activities. Note that such activities may include but are not limited to noise, vibration, chemical odors, hours of operations, low overhead flights, and other associated activities.

Chapter Four
ALTERNATIVES ANAYLYSIS

INTRODUCTION

Chapter Three described the deficiencies of Westport Municipal Airport with respect to existing and projected demand and WSDOT/FAA airport design standards. This chapter presents alternatives for accommodating most of these deficiencies and reasons for why some deficiencies are infeasible to fix at the existing airport site. The proposed alternatives are evaluated for environmental consequences, functionality, and relative cost. This chapter also describes the preferred alternative, which was selected by the City, following review by WSDOT and the Advisory Committee.

SUMMARY OF FACILITY REQUIREMENTS

As stated in the previous chapter, it may not be feasible to develop the airport to meet the ADG-II standards that are applicable for the King Air C90B design aircraft or to provide an instrument approach. Without considering environmental or funding constraints, Chapter Three identified the following needs at the airport over the 20-year planning period:

- Realign the runway and/or provide a crosswind runway to provide at least 95% wind coverage. This conclusion is based on wind data from Bowerman Field. Before such a major project as runway realignment or a new crosswind runway is undertaken, a wind survey should be conducted at Westport.

- Strengthen airfield pavements as required to accommodate 12,500 pound aircraft.
- Lengthen the runway. A length of 2,800 feet will accommodate 95% of the small aircraft fleet with fewer than 10 seats, according to FAA criteria. The minimum length for having an instrument approach without penalizing the approach visibility minimums is 3,200 feet. Westport Shipyard's insurance requirements for the King Air C90B call for a runway length of at least 3,400 feet.
- Widen the runway to 60 feet, 75 feet, or 100 feet to meet the applicable WSDOT/FAA standard. The width standard varies according to instrument approach visibility minimum and ADG.
- Bring RSA and OFA into compliance with WSDOT/FAA standards. The airport does not meet standards for ADG I (visual approaches only) and is more deficient in meeting standards for ADG-II (instrument approaches).
- Construct a full-length parallel taxiway, which is a requirement for an instrument approach according to WSDOT/FAA criteria and is recommended by the State for Local Community Airports with at least 10 based aircraft.
- Make improvements to accommodate instrument approaches, which are recommended by the State for Local Community Airports with at least 10 based aircraft. Obtain a feasibility study from the FAA Flight Procedures Office to determine the best approach feasible. The lower the instrument approach visibility minimum, the larger is the required RSA, OFA, and RPZ. Approach lighting is recommended or required for some types of instrument approaches.
- Improve navigational aids, lighting, and pavement markings:
    - Repair existing VASIs or install PAPIs on both runway ends.
    - Install a rotating beacon.
    - Install edge reflectors or lighting along all taxiways.
    - Install REILs.
    - Install a Pilot Controlled Lighting system.
    - Install standard hold signs and distance-to-go signs.
    - Paint hold markings on taxiway pavements.
- Install a weather reporting system (AWOS or SuperUnicom), which is a requirement for an instrument approach.
- Accommodate helicopter operations.
- Accommodate future landside and support facility needs, either by leasing land for private development or by City development. These needs include additional hangars for based aircraft and aviation businesses, an FBO, a pilot's lounge/flight planning facility, and self-service fueling.
- Install perimeter fencing to keep dogs, wildlife, and unauthorized persons away from aircraft operating areas.

DEVELOPMENT CONSTRAINTS

An important step in identifying alternatives is analyzing the context in which airport development must occur, including constraints and opportunities. At Westport, the primary development constraints are related to environmental issues. **Exhibit 4A** highlights the areas of environmental concern.

Environmental Constraints

Federal, state and local environmental laws require consideration of the natural and built environment in evaluating potential improvements at an airport. Westport Municipal Airport is located in an area surrounded by tidal marshes, freshwater wetlands and other potentially sensitive environmental features. The following summarizes the environmental context of the airport.

Natural Environment. Natural environment elements include features such as air quality, soils and geology, water resources (and associated water quality), wetlands, plants and animals (including endangered species and commercial fisheries). Critical elements at Westport include wetlands, water quality, commercial fish species and endangered species, as well as the interaction between them.

The runway and taxiways are built on fill above the surrounding ground level. As a part of the 1991 airport improvement, a wetland permit was obtained to fill some wetland areas and enhance others. There is a full-length drain on the east side of the runway that serves to convey storm water from the runway. It also appears to provide a tidal linkage to the airport area at times of higher tides. The area between the runway and the apron, as well as the area parallel to the runway on the western side, was used for a wetland improvement project. The area is divided into five subareas with the following conditions and goals established in the 1989 mitigation plan:

1. Southern end to southern taxiway – Area was enhanced to create intertidal ponds and channels. No mowing in this area, with the goal of attracting waterfowl and potentially providing fish habitat. Area does not appear to be functioning as planned. Waterfowl habitat is inconsistent with airport use.

2. Area between taxiways – The area was enhanced and established as a "no mow" area. The goal was to create wetland areas with no open water ponds. A culvert provides water transfer between tidal "east drain." Area is cluttered with litter, storm and tidal debris.

3. North of north taxiway to runway end – The area was enhanced and established as a "no mow" area. The goal was to create wetland areas with no open water ponds. Culverts provides water transfer between tidal "east drain" and Area 2. Area is cluttered with litter, storm and tidal debris.

4. Northern RSA – "Pristine" wetland transected with main tidal drain. Area served as reference for on-site wetland enhancement.

5. East Ditch – Established to create a combination of tidal channels, mud flats and tidally flooded areas. Potential fish and waterfowl habitat. Provide drainage of airport..

Actions which would impact these areas would be required, at the time of design, to undergo a review for impacts, including potential wetland permits through the Corps of Engineers and

Washington Department of Ecology, and endangered species review through NOAA Fisheries, US Fish and Wildlife Service and Washington Department of Fish and Wildlife.

All of these areas provide some level of water quality treatment for stormwater running off the airport and the adjacent developed lands.

The Grays Harbor estuary is home to many fish, crustacean and shellfish species, many of which are commercially harvested. Water quality is a critical issue for the survival of these commercial markets as well as for fish on the Endangered Species List. Habitats of many fish species are also protected under the Endangered Species Act and the Magnuson-Stevens Act.

Evaluation of airport improvements will need to consider the potential impacts on wetlands, surface waters, and the potential for water quality impacts.

Built Environment. Built environment elements include land use (discussed above), property impacts including noise, and impacts on the community associated with changes at the airport.

As discussed above, the Airport has open land on the south, open water on the east, and developed uses on the north and west. Key issues of airport development (e.g. runway extension, parallel taxiway development) include noise effects on adjacent residences, community character changes as a result of a potentially busier airport, and protection of the airport from incompatible land uses.

Other Constraints

Because of environmental constraints, existing off-airport development adjacent to the airport, and limited funding to overcome these constraints, it is very difficult for the airport to meet all the WSDOT/FAA airport design standards applicable to the unconstrained facility requirements. To fully meet the long-term aviation needs, the airport should be relocated to a new site. However, the goal of this study is to determine the best solution for development at the existing airport site. To do that, it has been necessary to decide that some of the facility requirements addressed in Chapter Three are not feasible to provide at the existing airport site.

Providing a crosswind runway or runway realignment to meet the WSDOT/FAA wind coverage recommendation would have such a significant environmental impact, it has been dismissed from further consideration.

It has also been concluded that it is not feasible to acquire the amount of land that should be contained within the airport boundary to protect Part 77 imaginary surfaces[1] from obstructions that could be hazardous to aviation. Instead, the less demanding criteria for object clearance from FAA Advisory Circular 150/5300-13, ***Airport Design***, are used to determine land acquisition for the proposed airport development alternatives. Using Part 77 as guidance for the airport boundary, airport property should include the land within the primary surface and land under portions of the approach and transitional surfaces to the point where these surfaces are 35 feet above the runway. If the airport owns the RPZ, it also owns the significant portion of the

[1] The imaginary surfaces are defined in 14 CFR Part 77, *Objects Affecting Navigable Airspace*.

approach surface. Most of the existing RPZs at Westport extend beyond airport property. The RPZ required if the runway has an instrument approach with visibility minimum below 1 mile is much larger than if it has a visual approach. The transitional surface slopes up and out perpendicular to the runway from the edges of the primary and approach surfaces. For the existing airport, the point at which the transitional surface is 35 feet above the runway is 375 feet from the runway centerline, which includes several homes located on Elizabeth Street. With an instrument approach, the primary surface would widen so that the recommended boundary would extend even farther towards Elizabeth Street.

Meeting the standards from FAA's *Airport Design* will be difficult, particularly the standards for ADG II and instrument approaches. **Exhibit 4B** was prepared to compare design standards (particularly Runway Protection Zones, Safety Areas, and Object Free Areas) of four scenarios and to highlight the impact these standards would have on the Airport and its surroundings:

- Picture A – Picture A depicts WSDOT/FAA standards for the existing condition - ADG I (small)[2] and a visual approach. The existing conditions do not meet these standards.
- Picture B – Picture B depicts the standards for ADG II (small)[3] and a visual approach. In this scenario the RSA, OFA, and RPZ become wider. The wind sock becomes a penetration to the RSA, and the OFA begins to encroach on the houses located southwest of the runway. Picture B shows the existing runway length of 2,317 feet.
- Picture C – Picture C incorporates a runway length of 3,200' and shows standards for ADG I (small), and instrument approach procedures to both ends with visibility minimums greater than or equal to ¾ mile. The RSA and OFA dimensions are the same as in Picture A, however the RPZ is significantly larger. The south RPZ is primarily over water, while the north RPZ is penetrated by the mini-storage facility, a portion of the RV Park, and other industrial buildings.
- Picture D – Picture D also incorporates a runway length of 3,200'. This scenario shows design standards for ADG II (small), and instrument approach procedures with visibility minimums lower than ¾ mile. The dimensions of all the surfaces increase and encompass more off-airport residential, commercial, and industrial areas.

Due to the size of the standard surfaces for ADG II and the effect that they would have on the surrounding wetlands, houses, and other buildings, the scenarios shown in Pictures B and D have been eliminated from further consideration for the future development of Westport Municipal Airport. Although the King Air C90B is an ADG II aircraft, its wingspan is only 1-foot, 3 inches larger than ADG I. If the King Air C90B's requirement for runway length is met and the airport layout provides adequate room for the King Air C90B aircraft to taxi safely to the hangar and to maneuver on the apron, it is not vital for the airport to meet the standards for ADG-II.

[2] Westport Shipyard's Piper Aztec and the aircraft based at the airport are ADG-I (small).
[3] Westport Shipyard's new King Air C90B is ADG-II (small).

The clearance areas required for approach visibility minimums lower than ¾ mile, compared with approach visibility minimums not lower than ¾ mile, are considerably larger, leading to the conclusion that planning for an instrument approach with lower than ¾ mile visibility minimum should also be eliminated from further consideration.

Consequently, the alternatives proposed for future development of the airfield are based on the standards shown in Pictures A and C of Exhibit 4B.

DESCRIPTION OF ALTERNATIVES

Four proposed alternatives for the runway and two alternatives for landside development are described in this section. Both the runway and landside alternatives include a "No Action" alternative.

Runway Alternatives

The four runway alternatives are as follows:

- Runway Alternative 1 is the No Action alternative.
- Runway Alternative 2 provides minimal improvements to bring the existing condition into compliance with WSDOT/FAA airport design standards.
- Runway Alternative 3 lengthens the runway, adds a parallel taxiway, and accommodates circling approaches with 1-mile visibility minimums.
- Runway Alternative 4 provides a better instrument approach and longer runway than Alternative 3 and also includes a full-length parallel taxiway.

Table 4A summarizes the major facilities associated with each runway alternative.

Table 4A, Runway Alternatives Comparison

	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Runway Length	2,317'	2,317'	2,800'	3,200'
Runway Width	50'	60'	60'	60'
Parallel Taxiway	No	No	Yes	Yes
Standard RSA/OFA?	No	Yes	Yes	Yes
Instrument Approach?	No	No	Yes – w/penalty	Yes
Land Acquisition[1/]?	No	Yes – 12 acres	Yes -17 acres	Yes- 120 acres

Source: W&H Pacific, 2006
Note: [1/] Acreage shown includes acquiring land within RPZ that is not currently owned.

Each runway alternative is described in more detail below. Although not specifically described or illustrated, Alternatives 2, 3, and 4 include the previously recommended improvements to navigational aids, lighting, and pavement markings and the construction or reconstruction of the airfield pavements to meet WSDOT/FAA specifications for 12,500 pound aircraft.

Alternatives 2, 3 and 4 all include acquiring land or easements in the RPZs to ensure land use compatibility. Particularly where there is existing development, this may take many years to

fully implement. Land use control of the RPZs is primarily for the protection of people on the ground, which is why residences, public assemblies, and bulk fuel storage should not be in an RPZ. RPZs also protect aviation by preventing approach surface obstructions and activities that attract wildlife. Even if existing incompatibilities cannot be eliminated quickly, it is important to ensure land use compatibly problems in the RPZs do not worsen.

Three of the four runway alternatives depict long-term improvements that would be implemented over a period of several years. A short-term, interim runway improvement has been proposed that could be incorporated in any of these three alternatives.

Potential Interim Runway Development. While the King Air C90B is considered the future design aircraft, it is used now by Westport Shipyards. The Shipyard would like to use the airplane at Westport Municipal Airport and has even considered funding the paving of RSA areas, or overruns, at the ends of the runway in order to lengthen the runway for takeoff.

Runway extensions into RSA and OFA areas are not recommended by WSDOT or FAA, but are acceptable at constrained airports when declared distances conforming to Appendix 14 of ***Airport Design*** are employed. Declared distances are the distances an airport owner declares available for the airplane's takeoff run, takeoff distance, accelerate-stop distance, and landing distance requirements. By extending the runway 185 feet on the north end and moving the existing threshold 5 feet and paving 90 feet on the south end and moving the existing threshold 90 feet, the following declared distances would be available:

Takeoff Run Available (TORA):	2,592 feet
Takeoff Distance Available (TODA):	2,592 feet
Accelerate-Stop Distance Available (ASDA):	2,412 feet
Landing Distance Available (LDA):	2,232 feet

Runway Alternative 1. Exhibit 4C depicts the No Action alternative. No capital improvements would be constructed. The airfield would continue to be maintained and operated in its current configuration. The airport would continue to be unable to accommodate Westport Shipyard's King Air C90B and the safety concerns associated with not complying with WSDOT/FAA design standards would continue.

Runway Alternative 2. As shown in **Exhibit 4D**, this alternative would maintain the existing runway/taxiway configuration. Alternative 2 includes minimal improvements to comply with standards, by providing standard Runway Safety Areas and Object Free Areas, and widening the runway to the FAA recommended width of 60'. The existing RSA is 2,707' by 70'. With Alternative 2, fill would be required along the sides and south end to bring it to the required size, 2,797' by 120'.

Unless declared distances are employed and the runway is extended into the RSA as discussed above, Alternative 2 would not lengthen the runway to accommodate use by the King Air C90B. Runway approaches would continue to be visual.

Portions of the RPZ that extend beyond airport property would be acquired by the City or an easement for the RPZ would be acquired to ensure compatible land use within the RPZ. If it is considered a place of public assembly, the go-kart activity in the RPZ should be discontinued.

The only land easement/acquisition associated with the airfield would be in the RPZs.

For information, Exhibit 4 D shows the FAA recommended airport boundary (for protection of Part 77 imaginary surfaces) is shown.

Runway Alternative 3. Exhibit 4E illustrates Runway Alternative 3. This alternative includes a moderate level of improvements - extending both ends of the runway for a total length of 2,800 feet, widening the runway to 60', constructing a full length parallel taxiway, and incorporating an instrument approach procedure with visibility minimums of one mile.[4] The instrument approach would be aided by GPS. Although an obstruction or feasibility study has not been conducted, it is likely that the airport facility and its surroundings would allow a 1-mile visibility minimum approach. Fill would be required to provide an RSA of 3,280' by 120'. Fill would also be required for the parallel taxiway safety area, which would be 49' wide.

The parallel taxiway in Alternative 3 would be located 150 feet from the runway (measured between centerlines), which is the standard for ADG-I (small aircraft exclusively).

Portions of the RPZ that extend beyond airport property would be acquired by the City or an easement for the RPZ would be acquired to ensure compatible land use within the RPZ. If they are considered a place of public assembly, the go-kart track and associated building activity should be discontinued.

Additional land acquisition would be needed on the west and east sides so that the airport property would contain the object free areas of the runway and parallel taxiway.

For information, Exhibit 4E shows the FAA recommended airport boundary (for protection of Part 77 imaginary surfaces).

Runway Alternative 4. Alternative 4 (**Exhibit 4F**) incorporates the most improvements. The runway is extended on the south end for a total length of 3,200' and widened to 60', a full length parallel taxiway is provided, and instrument approaches with visibility minimums greater than or equal to ¾ mile are planned.

The instrument approaches would be aided by GPS. An obstruction or feasibility study has not been conducted, so it is not known if the airport facility and its surroundings would allow a 3/4-mile visibility minimum approach. Approach lights are recommended for this approach.

Fill would be required to provide an RSA of 3,680' by 120'. Fill would also be required for the parallel taxiway safety area, which would be 49'wide.

[4] Because this option does not provide a 3,200' runway, if an instrument approach is implemented a penalty will be applied to the Height Above Touchdown (HAT). 3,200' is the minimum runway length for an instrument approach without this penalty.

The parallel taxiway in Alternative 4 would be located to align with the existing partial parallel taxiway, 215 feet from the runway (measured between centerlines). This distance is greater than the 150 feet required for ADG-I, but would provide more distance for aircraft with wider wingspans. The standard dimension for ADG-II is 240 feet. Consequently, the 215-foot dimension should be adequate for an ADG-II aircraft to use the taxiway while an ADG-I aircraft is using the runway, or vice versa.

Portions of the RPZ that extend beyond airport property would be acquired by the City or an easement for the RPZ would be acquired to ensure compatible land use within the RPZ. The north RPZ acquisition would be so extensive that it might be prudent to limit the north approach to visual or 1-mile visibility minimum, which would reduce the size of the RPZ by 40 acres.

Additional land acquisition would be needed on the west and east sides so that the airport property contains the object free areas of the runway and parallel taxiway.

For information, Exhibit 4F shows the FAA recommended airport boundary (for protection of Part 77 imaginary surfaces).

Alternative 4 shows land acquisition for a helicopter landing facility. There is adequate land shown to accommodate the inner portion of the approach surface and allow a helicopter operator to lease land and build a hangar. Helicopters should not operate too close to where small airplanes are taxiing or parked, due to the potential damage to rotorcraft. In the other alternatives that lack a separate facility for helicopters, the northeast edge of the existing apron edge would be the best location for helicopters.

Landside Facility Alternatives

Landside facilities include hangars, tiedowns, support facilities, and vehicle parking and access. Chapter Three projects the need for additional hangars, a pilot's lounge, fueling facility, and fencing.

The No Action alternative would accommodate none of these additional facilities. Existing facilities would be maintained. Excess tiedown capacity would be available to accommodate an increase in based aircraft; however, the demand from aircraft owners is for hangars, not tiedowns. With the No Action alternative, the City could consider proposals for additional through-the-fence operations from off-airport development.

One landside development alternative has been created to show a potential layout that will accommodate long-term demand. The alternative is depicted in **Exhibit 4G**.

Landside development is less eligible or a lower priority for WSDOT grant funds than airfield development. The same is true for FAA-administered funding, if Westport Municipal Airport is ever included in the NPIAS and eligible for those funds. At many airports, private entities develop hangars and other landside improvements on land leased from the airport owner. This is the case with the Westport Shipyards hangar. If the City were to fund improvements, such as

hangars, the revenue from leasing them would be greater than the revenue from a ground lease. However, the City must provide the capital funding and there is a greater risk associated with renting facilities than with ground leasing.

The City has been approached by a developer interested in developing hangars and eventually an FBO. If the City elects to lease land to the developer, the developer may propose a slightly different layout than Exhibit 4G. However, the developer must comply with WSDOT/FAA design standards and building codes. In addition, before significant development occurs at the Airport, it would be prudent for the City to establish Minimum Standards for Aeronautical Activities.[5]

Exhibit 4G shows a total of 29 additional hangars, which exceeds the projected long-term need for 12. Demand for hangars may grow more than forecast, or the Airport would have capacity beyond the 20-year planning horizon. Hangars should be constructed as warranted by demand.

Three nested T-hangar buildings would each be accessible from two sides and contain storage for 26 aircraft. Three individual hangars are also depicted, two are 60' by 60' and the third is 80' by 80'. These individual hangars provide space for larger aircraft or for conducting an aviation business.

In addition to hangar buildings, Exhibit 4G also shows a lot reserved for the establishment of an FBO, an aviation business that provides aircraft storage, maintenance, fueling, and similar services. The lot is sized to accommodate an FBO hangar that is approximately 100 feet by 100 feet, plus side yards and space for customers to park. A public auto parking lot, where the existing auto parking is located, is north of the FBO lot, adjacent to the pilot lounge. A second auto parking lot is located near the new T hangar buildings. This lot could be used by aircraft owners and their guests while flying. Each lot should accommodate five to ten vehicles. The pilot lounge is situated adjacent to the apron and parking area for tiedown users' convenience and easy access to/from aircraft after checking the weather or taking a break. A self-service fueling facility is located on the north side of the apron. Perimeter fencing is shown along the south edge of the hangar development area to Montesano Street where it follows the road to the north side of the FBO lot, and continues along the west edge of the apron. Auto parking lots would be outside the fenced perimeter.

All of the facilities shown on Exhibit 4G meet or exceed long-term demand defined in the previous chapters, and comply with FAA/WSDOT design standards for ADG-I. Because many of the support facilities identified in this exhibit are not planned to be developed until the intermediate- and long-term horizons, and because other airports improvements are a higher priority (i.e., runway lengthening and widening, runway safety area improvements, wetland mitigation), it may be worthwhile for the City to consider updating this ALP at that time to reflect any completed improvements and/or changes in demand or other needs.

As previously mentioned, the City has been approached by a developer interested in building hangars and eventually an FBO at the airport. The developer submitted a proposed layout to the City in early 2005. Due to the conceptual nature of the sketch, it is unclear if FAA/WSDOT

[5] FAA guidance is available for Minimum Standards.

standards are met, although the space appears to be laid out efficiently. There are three hangars shown which appear to be eight to 12 units each; this would more than accommodate 20 year demand projections. The area sited as future FBO is relatively large and would provide adequate space for an aviation maintenance or avionics shop. The layout also includes a large auto parking area and a possible restaurant or other aviation facility. Based on the developer's conceptual layout, it appears that the size and general location of the facilities will be adequate for long-term needs. However, placing a hangar immediately adjacent to Westport Shipyard's hangar, as shown, would require the Shipyard's permission and possibly a fire wall for code compliance. In addition, a full-service restaurant would likely need to draw customers additional to airport users to be financially viable. Care would need to be taken to facilitate access by customers from outside the airport, while preserving control of access to the airport, and auto parking for these customers would be additional to airport demand. With limited land available for the development of landside aviation facilities, it might be preferable for on-airport food service to be limited to a snack bar and catering service, particularly since a full service restaurant is located immediately adjacent to the airport.

ALTERNATIVES EVALUATION

Alternatives have been evaluated based on factors such as environmental impacts, safety, functionality, and capital costs. Table 4B, below, provides a summary of potential environmental impacts and concerns associated with the alternatives and Table 4C evaluates the alternatives based on other factors mentioned above.

Table 4B, Environmental Comparison of Alternatives

Environmental Element	Runway Alternatives 1, 2, 3 and 4 and Landside Alternative
Controversy	Controversy is a measure of community opposition or concern over the proposed project. Alternatives 1 and 2 have minimal potential for controversy. Alternative 3 may generate some controversy, likely associated with on property acquisition, noise, and wetland fill, Alternative 4 may generate significant controversy due to lengthening, property acquisition, land use limitations in expanded RPZ, wetland fill and noise. The landside alternative is not likely to generate controversy, likely favored by parts of community.
Noise	Airports generate noise, particularly from takeoffs and landings. Noise is modeled based on the number of operations, type of aircraft, airport features (e.g. runway length) and produces noise contours in 10 decibel increments. Alternatives 1 and 2 would have no change in noise profile for the airport. Alternative 3 would extend noise contours slightly to the north and south, while Alternative 4 would extend contours to the south with potential impacts on residences. Helicopter activity is forecast for the airport; all the alternatives except 4 will have helicopters operating near the apron and noise sensitive areas. Landside area not likely to contribute to overall noise profile.
Compatible Land Use	Airports are typically considered an essential public facility that needs to be protected from encroachment of incompatible land uses. Areas in the RPZ should not have places of public assembly; parking, warehouse and storage

	facilities are typically allowable uses. The City needs to adopt airport-protective zoning, regardless of alternative. Landside actions are consistent with public and airport use designations. Alternative 4 would require a larger area of protection than the other alternatives. The existing amusement park/go-kart track is probably an incompatible use in the existing RPZ. All of the alternatives except Alternative 1 would eliminate incompatible land uses in RPZs.
Social Impact	This is related to relocations of residents and businesses, the impact of any surface transportation changes, et cetera. Alternative 1 would have minimal impact. Alternative 2 would require some property acquisition. Alternatives 3 and 4 would involve acquisition of yards from existing residences, may require acquisition of some homes along Elizabeth Avenue, especially under Alternative 4. Property values of the remaining homes adjacent to the airport may also be affected by Alternatives 3 and 4. Residents adjacent to the landside improvements may have some impact from being closer to airport activity.
Induced Socio-Economic Impacts, Environmental Justice, and Children's Health and Safety	Impacts in this category relate to economic development, employment opportunity, relocations of businesses or residents, changes in surface transportation, or other activities considered potentially disruptive to the community. As alternatives increase in development intensity, there are trade-offs between community social impacts and potential increases in economic benefits to the community. For example, the No-Action alternative would not allow the unconstrained forecast to occur, thus negatively impacting the economic potential of the community. Alternative 4 would allow the unconstrained forecast to occur, helping Westport become attractive to various types of growth, but at an impact to existing residents and neighborhoods. There do not appear to be environmental justice issues or issues that specifically impact children associated with any of the alternatives.
Air Quality	In more urbanized areas, air quality, as measured by concentrations of specific monitored pollutants, including carbon monoxide, ozone, and particulates, can be a problem. At small, general aviation airports, and in somewhat rural coastal areas, air quality is not an issue. All alternatives would have negligible long-term impact on air quality. As the area of ground disturbed during construction increases, the temporary impacts related to airborne particulates may increase. Ground disturbance associated with the landside alternative could temporarily create airborne dust.
Water Quality	Water quality impacts are typically related to stormwater quantity and the potential for any contaminants in stormwater runoff. Water quantity issues increase as the amount of impervious surface increases. Alternative 1 would not change the existing condition. Water quality issues for the landside alternative and alternatives 2, 3 and 4 can likely be mitigated through expansion and enhancement of the vegetated swales which currently exist on the airport.

Section 4(f) and Cultural Resources	Section 4(f) relates to potential impacts of an airport on recreation facilities, historic structures or certain other lands considered public. Cultural resources are where tribal or other historic or archaeological issues are reviewed. Alternative 1 would not increase the area previously disturbed. Disturbance of any new ground in a tidal or coastal area has the potential to unearth cultural resources. Alternatives 2, 3 and 4, as well as the landside alternative, would require consultation with the tribes and State Historic Preservation Office and likely require a records search and field visit by a qualified archaeologist. Alternatives 3 and 4 may have "constructive use" issues with the parkland south of the airport.
Biotic Communities (including T&E Species, Essential Fish Habitat, Migratory Birds)	This category includes general biological conditions, State and federally listed threatened and endangered species, Magnuson-Stevens Act (MSA) fish species and bird protected under the Migratory Bird Act. The primary issue on the airport will be endangered and MSA fish species. A biological evaluation will need to be prepared for any action where there is new impervious surface or ground disturbance, and the likelihood of a determination of "may effect" increases as the amount of new impervious surface increases. The requirements for mitigation of impacts, primarily as related to wetlands and water quality will increase with the intensity of the alternatives in order to meet regulatory agency requirements.
Wetlands	The airport appears to be surrounded by wetlands. Alternative 1 will not impact any wetland areas. Alternatives 2, 3 and 4 will require more than one acre of fill. Alternatives 2, 3, and 4 will require compensatory mitigation for wetland impacts, and should be located off-airport to reduce the potential for wildlife strikes, in accordance with FAA guidelines. This would include acquisition of property for mitigation to occur on, or financial participation in an established mitigation "bank." The landside alternative does not appear to affect potential wetland areas.
Floodplains	None of the proposed alternatives would raise base flood levels for the area.
Coastal Zone Management	The City has a Shoreline Management Plan and protective ordinance. The airport property and potential development area appears to be outside of the Shoreline zone. Alternative 4 could require approach lighting at the south end that would likely be installed in the water. This would require approvals within the City's land use/shoreline process.
Wild and Scenic Rivers	There are no designated Wild and Scenic Rivers in the airport vicinity.
Farmlands	This category relates to the Farmland Preservation Act. None of the land affected by any of the alternatives is currently farmed. The soils in the area are not on a list of Prime and Unique farm soils as identified by the Natural Resources Conservation Service.
Energy Supply and Natural Resources	This category relates to the demand placed by alternatives on any potentially scarce resources, including energy and construction materials. In ascending order, each runway alternative places a greater demand on energy use for construction, and an increased use of fill soil, rock, gravel and petroleum for paving. The landside alternative will also require these resources, along with materials for building hangars and other structures. None of these items are

	considered scarce in the Westport vicinity.
Light Emissions	Each of the alternatives includes improvement of airport lighting and lighted navigation aids. These lights are typically focused for pilots to see and would have little off-airport visibility. Alternative 4 could include installation of approach lighting in the water at the southern end. Buildings would likely have security lighting that would be visible off-site during times of darkness.
Solid Waste	Airport operations generate small amounts of solid waste. Construction can also generate materials if there is demolition or excavation. In general, the alternatives are equal in this regard. Existing piles of concrete and debris will need to be removed for construction of the landside alternative.
Construction Impacts	This category reviews the temporary impacts of construction on the above elements of the environment. Critical areas include erosion as it relates to water quality, potential for spills of petroleum or other contaminants, and airborne particulates from excavation activity. As the intensity of development increases with each alternative, so do the risks for construction-related impacts. Most of these risks can be managed through pro-active work, including erosion fencing and other site management activities in the construction specifications.
Hazardous Materials	The history of former septic system use by homes on the east side of Elizabeth Street is not known, but may be a concern. Based on general knowledge of the area, it is not believed that any issues will arise beyond former septic systems or home heating oil tanks. Any land used for new airport development, including the area where construction debris has been dumped, should undergo a "Phase I" study for potential contaminants.
Cumulative Impacts	This category reviews the proposed airport development action in the context of known and anticipated future actions in the airport vicinity. Alternatives 3 and 4 may present potential cumulative impacts as associated with wetland filling, water quality, and potential uses of property to the southeast of the airport.

Table 4C, Runway Alternatives Evaluation for Safety, Function, and Cost

	Runway Alternative 1	**Runway Alternative 2**	**Runway Alternative 3**	**Runway Alternative 4**
Safety	Does not meet FAA/WSDOT design standards in several areas (RSA, OFA, runway width and length). Lack of rotating beacon and other needed navaids remain safety deficiencies.	Airport complies with RSA/OFA and runway width standards. Navaid improvements enhance safety. Incompatible land use in RPZ corrected. Perimeter fence reduces runway	Design standards are met. Navaid improvements enhance safety. Incompatible land uses in RPZs corrected. Parallel taxiway eliminates need for aircraft to back-taxi on runway before	Design standards are met. Navaid improvements enhance safety. Incompatible land use in RPZs corrected. Parallel taxiway eliminates need for aircraft to back-taxi on runway before

	Incompatible land use remains in RPZ.	incursion potential.	takeoff or after landing. Perimeter fence reduces runway incursion potential.	takeoff or after landing. Perimeter fence reduces runway incursion potential.
Function	Maintains existing configuration and facilities, therefore, maintains existing functional deficiencies.	Improvements in navaids, lighting, and pavement marking increase functionality, but runway length remains deficient for critical aircraft and no improvement in all-weather use.	Runway length is adequate for critical aircraft, but still less than WSDOT standard for Local Community Airports with at least 10 based aircraft. New approach capability reduces time airport is closed because of weather.	Runway is longest of alternatives, so serves more aircraft types/more conditions. Instrument approach provides lower minimums than Alternative 3, resulting in less time airport is closed. New helicopter area prevents possible damage to fixed wing aircraft by rotor wash, although helicopter operators may prefer access to amenities at the apron on the west side.
Capital Cost	No capital costs are incurred.	Lower capital cost than Alternatives 3 and 4.	Higher cost than Alternatives 1 and 2, but significantly lower than Alternative 4.	Highest capital cost due to most wetlands fill, most pavement construction and most land acquisition.

PREFERRED ALTERNATIVE

The four airside and one landside alternatives were presented to the public and the Airport Layout Plan Advisory Committee in August, 2006. After further review and consultation with

the Committee, the City decided upon a preferred alternative for development at Westport Municipal Airport, which is shown in **Exhibit 4H.** This alternative incorporated recommendations of the Airport Layout Plan Advisory Committee and is based on various components of each of the alternatives presented in this chapter, as well as a few additional components not previously depicted. The list below summarizes the proposed development plan. Further documentation is provided in the text that follows.

- Extend Runway 12/30 250 feet north and 833 feet south for a total runway length of 3,400 feet.
- Widen runway to 75 feet.
- Expand the Runway Safety Area around the runway to 120 feet wide and 240 feet beyond each runway end to provide a safe place for recovering aircraft that overshoot, undershoot, or leave the runway.
- Construct a partial parallel taxiway from the existing apron to the Runway 12 end.
- Construct a full length parallel taxiway on the east side of the runway.
- Obtain a circling GPS instrument approach procedure with visibility minimums of one mile or greater. This type of approach will result in RPZ dimensions of 250 by 450 by 1,000 feet.
- Construct additional hangars
- Construct a pilot's lounge
- Reconfigure existing auto parking area to accommodate space for an FBO or other aviation service provider.
- Acquire land on all sides of the Airport.

The Airport Advisory Committee agreed that the most critical facility need is a runway length adequate for Westport Shipyards' King Air – 3,400 feet. The runway extension length on each end is based on maintaining a clear and compatible RPZ. The extension length on the Runway 12 end is limited by the location of buildings and other facilities on the north side of the Airport and therefore has a maximum extension length of 250 feet. The remaining length needed to obtain an ultimate runway length of 3,400 feet was added to the Runway 30 end.

All of the alternatives presented in the chapter depict a 60-foot runway width while the preferred alternative shows a 75-foot runway width. This 75-foot width is more than required for ADG-I; it is the width required for ADG-II. Due to crosswinds that frequent the Westport Airport; the additional width will provide a safety factor by allowing additional maneuvering room for operations during crosswind conditions. The FAA has in some cases allowed airports to increase their runway width to the next higher Airplane Design Group standard if the runway alignment provides less than 95% wind coverage, and a crosswind runway is not feasible. Exact wind coverage is not known at this time, although historical wind data for Bowerman Field and anecdotal evidence at Westport suggests this is the case. In order to be eligible to receive WSDOT Aviation funding for a runway wider than 60 feet, additional justification that the wind coverage is less than 95% will be required. It is also worth mentioning that only the runway pavement width would be "upsized" one design group category for wind coverage. All other standards should remain as ADG I.

If the runway width is indeed widened to 75 feet, the ADG-II standard width, to provide additional crosswind coverage, the Airport is still to remain a Design Group I airport; therefore all other dimensional standards should remain as Design Group I.

A full length parallel taxiway was depicted on the west side of the runway in several of the alternatives. Constructing a taxiway in this location would impact several houses and properties near the south end of the runway. In order to avoid this impact, the preferred alternative depicts a full length parallel taxiway on the east side of the runway and a partial parallel taxiway on the west side between the apron and the Runway 12 end. The east side full length taxiway is depicted as an ultimate build out option; however, due to the location of the taxiway in a high valued wetlands area, construction of the taxiway may not be environmentally feasible. In addition, the FAA does not require a full length taxiway for visual runways. For this reason, the runway extension on the south end is planned to include a turnaround which can eventually become part of a full length parallel taxiway when an instrument approach is implemented that requires a parallel taxiway, or when aircraft traffic grows enough to warrant the parallel taxiway for safety reasons.

The Landside Facility exhibit (4G) calls out an area for installation of a self-service fueling facility. The location of the proposed fueling facility would limit the existing number of tie-downs and was therefore removed from the preferred alternative. Future aircraft fueling could be achieved via a mobile fuel truck. The truck could be stored adjacent to the proposed FBO area as shown in Exhibit 4H.

Nearly any action that requires a government approval in Washington State requires a review under the State Environmental Policy Act (SEPA). This can be a simple checklist developed and processed by the City, or the nature of the project may require a detailed environmental impact statement (EIS). In general, the key environmental issues that will need to be addressed for implementation of any action at Westport Municipal Airport include noise, endangered species/essential fish habitat, cultural resources and wetlands/water quality. Table 4D summarizes the anticipated study and permitting requirements for each element of the preferred alternative. A full environmental overview is provided in Appendix B.

If the airport becomes a NPIAS airport, the additional requirement of the National Environmental Policy Act (NEPA) will apply to projects with federal funding. Projects such as additional privately funded hangars would not need NEPA review. Some items are shown as "NEPA TBD" because the environmental review requirement is "to be determined." In some cases, the need to prepare an Environmental Assessment (EA) under NEPA or an EIS under SEPA is contingent on the amount of impact. It may be desirable to review some of the linked projects together, such as the runway extension, widening and RSA expansion. This will help in identifying cumulative impacts, as well as meet the needs of agencies such as the Corps of Engineers.

Table 4D, Anticipated Environmental Review Requirements

Action	SEPA/ NEPA	Noise	ESA/EFH	Cultural Resources	Wetlands	Other Issues
Runway extension to north and south	SEPA EIS NEPA EA	Noise contours prepared for entire preferred alternative	Biological Assessment (BA)	Site study and SHPO/tribe consultation	Delineation, impact assessment, permit, mitigation	Potential property acquisition/ relocation
Runway widening	SEPA EIS NEPA EA	Minimal impact	BA	Site study/ consultation	As above	
Runway safety area expansion	SEPA EIS NEPA EA	Minimal impact	BA	Site study/ consultation	As above	
Partial Parallel Taxiway on west side	SEPA TBD NEPA TBD	Minimal impact	BA	Not likely needed	As above	
Full Parallel Taxiway on east side	SEPA EIS NEPA EA	Minimal impact	BA	Site study/ consultation	As above	
Implement GPS approach	SEPA checklist	Minimal impact	Studies not likely needed unless areas require substantial earthwork, filling, or increases in impervious surfaces.			
Pilots Lounge and Hangars	SEPA checklist	Minimal impact				
Develop FBO	SEPA checklist	Minimal impact				Fuel storage permits etc needed from Dept. of Ecology
Land Acquisition	SEPA Expanded checklist or EIS Depending on number of relocations	Minimal impact				Appraisals and other procedural requirements.

Chapter Five
AIRPORT LAYOUT PLAN

The Airport Layout Plan (ALP) drawings are a pictorial representation and summarization of the efforts made in this planning process. The previous chapters on Inventory, Forecasting, Facility Requirements, and Alternatives Analysis and the reviews provided by the Airport Layout Plan Advisory Committee supply the basis for the future airport layout that is shown in the drawing set.

AIRPORT LAYOUT PLAN DRAWING SET

The following section describes the specific elements found on each sheet within the ALP drawing set.

Cover Sheet

The cover sheet shows location and vicinity maps of Westport Airport, a sheet index to the airport layout plan drawing set, and provides pertinent information such as the airport sponsor, airport name, grant number the project is funded through, and date the plan was completed. Typically, airport windroses would be depicted on this sheet, however because wind data is unavailable for Westport, there are no windroses to show.

Airport Layout Plan Drawing

The airport layout plan depicts the current airport layout and the proposed improvements to the airport for the 20-year planning period and beyond. Descriptions of the improvements and costs

over the next 20-years are included in Chapter 6, *Capital Improvement Projects*. As previously mentioned, the preferred alternative selected by the City of Westport after consultation with the Advisory Committee was the basis for determining the proposed improvements at the Airport. The future airport development is shown on the airport layout plan as required by WSDOT Aviation Division. The plan can be modified to accommodate development as dictated by demand.

Runway approach visibility minimums, runway protection zones, the runway object free area, the runway safety area and other standard airport dimensions are shown in the plan and in the runway data tables. Other tables include an airport data table, buildings/facilities table, modifications to standards, and a non-standard conditions and disposition table.

Airport Airspace Plan Drawing

This drawing shows the Part 77 Imaginary Surfaces for the future layout of Westport Municipal Airport with a USGS topographic map as the background. Part 77 defines five distinct surfaces, each with a different size and shape. The dimensions of these surfaces are based on the type of runway and the type of approach that exist or that is planned for the Airport. Each imaginary surface and its dimension as it applies to Westport Municipal Airport are defined below.

Primary Surface: A rectangular surface with a width (centered on the runway centerline) that varies for each runway and a length that extends 200 feet beyond each end of the runway. The elevation of the primary surface corresponds to the elevation of the nearest point of the runway centerline. The width of the primary surface of Runway 12-30 is 250 feet.

Approach Surface: A surface centered on the extended runway centerline, starting at each end of the primary surface (200 feet beyond each end of the runway), at a width equal to that of the primary surface and an elevation equal to that of the end of the runway. The approach surfaces at Westport Municipal Airport reflect visual approaches to both runway ends, which are the type required for circling GPS approaches with 1-mile visibility minimums. The surface extends for a horizontal distance of 5,000 feet at a slope of 20:1 to a width of 1,250 feet.

Transitional Surface: A sloping 7:1 surface that extends outward and upward at right angles to the runway centerline from the sides of the primary surface and the approach surfaces.

Horizontal Surface: An elliptical surface at an elevation 150 feet above the established airport elevation created by swinging arcs of a 5,000-foot radius from the center of each end of the primary surface.

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

The Part 77 surfaces are the basis for protection of the airspace around the Airport, therefore, it is ideal to keep these surfaces clear of obstructions whenever possible. At Westport Municipal

Airport, all identified obstructions are off airport property within the transitional surface. The obstruction data tables on Sheets 3 and 4 identify each obstruction, along with the disposition to address the described obstruction.

Obstructions to the Part 77 surfaces were determined based on preliminary field observation performed by W&H Pacific. The height of obstructions has not been determined by a survey, which will be required before an instrument approach procedure to the Airport can be established. Obstruction removal has been incorporated into the capital improvement program.

Runway Protection Zone Approach Plan & Profile Drawing

This drawing provides a plan and profile view of the runway and the Runway Protection Zones. There are no obstructions within the primary or approach surfaces, therefore obstructions are not shown in the profile view.

Land Use Plan Drawing

A land use plan has been developed for the airport and the surrounding area. This plan includes the land uses on and around the airport per the City of Westport Comprehensive Plan.

In general, land use concerns associated with the areas around airports fall into one of the following categories:

- Lighting
- Glare, Smoke and Dust
- Bird Attractions/Landfills
- Airspace Obstructions and Height Restrictions
- Electrical Interference
- Concentrations of People
- Noise Impacts

Any of these activities can create safety concerns for airport users and people on the ground or can be impacted adversely by airport operations. It is important that these issues be addressed in the land use zoning and development around an airport.

Chapter Six
CAPITAL IMPROVEMENT PROJECTS

Through the evaluation of the facility requirements, identification of the preferred alternative, and the development of the Airport Layout Plan, the improvements needed at Westport Municipal Airport over the next 20-year period have been determined. The capital improvement plan provides the basis for planning the funding of these improvements. The planned phases of development are in the 5-, 10- and 20-year time frames. Because one of the goals of this planning process was to identify an ultimate build-out scenario, improvement projects beyond the 20-year period have also been identified.

CAPITAL IMPROVEMENT PROJECTS

The Capital Improvement Plan (CIP) develops both the timeline for airport improvements and estimated costs for those improvements. The plan is divided into four phases: Phase I, present-2011; Phase II, 2012-2016; Phase III, 2017-2026; and Phase IV, beyond 20 years.

Phase I

Phase I is the first five years of the planning period, through 2011. The projects included in this stage are:

- Hangar taxilane and hangar construction
- Environmental assessment/preliminary engineering for runway improvements
- Obstruction removal (Part 77 and objects within the Runway and Taxiway OFA)
  -includes topping and/or removing trees and brush, and installing obstruction lighting on power poles)

- Installation of a rotating beacon
- Conduct wind study
- Implement Zoning/Land Use Recommendations

Phase II

Phase II is the second five years of the planning period, 2012-2016. Projects during this phase include:

- Development of mitigation sites for runway improvements
- Land acquisition (OFA, Runway 30 turnaround)
- Runway improvements (bringing RSA to standard, runway extension, widening and strengthening)
- Construction of Runway 30 turnaround
- Installation of PAPIs, REILs, and SuperUnicom
- Installation of perimeter fencing
- Hangar construction
- FBO building construction
- Acquisition of avigation easements

Phase III

Phase III is the last ten years of the planning period, 2017 – 2026. These projects include:

- Construction of partial parallel taxiway from apron to Runway 12 end
- Construction of parking lot near hangar area
- Land acquisition (landside development)
- Hangar taxilane and hangar construction
- Construction of pilot lounge

Phase IV

Phase IV includes the following projects that are beyond the 20-year planning period:

- Environmental assessment/preliminary engineering for eastside parallel taxiway
- Development of mitigation sites for eastside taxiway improvements
- Land acquisition (eastside parallel taxiway)
- Construction of eastside parallel taxiway
- Construction of midfield connector taxiway
- Construction of 10-unit T-Hangar

PROJECT COSTS

A list of improvements and costs over the next 20-years are included in **Table 6A** at the end of this chapter. All costs are estimated in 2006 dollars. Total project costs include construction, temporary flagging and signing, construction staking, testing, engineering, administration, and

contingency, as applicable. Utilities including phone and power are included in all new hangar projects, along with septic costs. No water service cost was added for the hangar developments.

FUNDING SOURCES

Because Westport Municipal Airport is not part of the NPIAS, it is not eligible to receive federal Airport Improvement Program (AIP) funding; therefore, funding for airport improvement projects is likely to come from the State of Washington Department of Transportation (WSDOT), the City of Westport, and private sources. Other funding sources that the City could pursue would be the State Legislature and Grays Harbor County. As the number of based aircraft at the Airport grows, the feasibility of being included in the NPIAS will increase.[1] The City should continue monitoring this possibility with WSDOT and the FAA. General aviation airports in the NPIAS now receive $150,000 in annual entitlements from the AIP and are eligible for discretionary AIP funding grants.

WSDOT provides grants of up to a maximum of $250,000 per grant per year. For projects funded by the State, the minimum sponsor share is 5%. It is important to note that eligibility for State funds does not ensure that funds will be available or granted.

[1] One criteria for being included as a NPIAS airport is for an airport to have at least 10 based aircraft.

TABLE 6A
Westport Municipal Airport

Proposed Capital Improvement Projects

	Project Description	Total Cost	Funding Source: City/Airport (5%)	Funding Source: State* (95%)	Funding Source: Private
Phase I (current-2011)					
1	Site Development (Taxilanes/Apron for 8-unit T-Hangar, 80x80 hangar)	$315,200	$0	$0	$315,200
2	Construct 8-unit T-Hangar	$840,200	$0	$0	$840,200
3	Construct 80x80 Hangar	$705,100	$0	$0	$705,100
4	Conduct Environmental Assessment/Preliminary Engineering (Runway Improvements)	$150,000	$7,500	$142,500	$0
5	Tree & Brush Removal Within Rwy and Twy OFA	$29,800	$1,490	$28,310	$0
6	Obstruction Removal (for Part 77)	$17,000	$850	$16,150	$0
7	Install Rotating Beacon	$25,500	$1,275	$24,225	$0
8	Conduct Wind Study	$10,000	$500	$9,500	$0
9	Implement Zoning/Land Use Recommendations	$20,000	$1,000	$19,000	$0
	Subtotal Phase I	**$2,092,800**	**$11,615**	**$220,685**	**$1,860,500**
Phase II (2012-2016)					
10	Develop Mitigation Site (22 acres) (Runway Improvements)	$2,489,200	$124,460	$2,364,740	$0
11	Aquire Land (.11 acres) (OFA)	$71,600	$3,580	$68,020	$0
12	Aquire Land (1.19 acre) (Runway 30 Turn-around)	$26,200	$1,310	$24,890	$0
13	Runway Project (Standard RSA, extend, widen, and strenghten runway)	$2,119,400	$105,970	$2,013,430	$0
14	Construct Runway 30 Turn-around	$158,300	$7,915	$150,385	$0
15	Install PAPIs	$139,500	$6,975	$132,525	$0
16	Install REILs	$136,100	$6,805	$129,295	$0
17	Install SuperUnicom	$42,500	$2,125	$40,375	$0
18	Install Perimeter Fencing (9,567')	$244,100	$12,205	$231,895	$0
19	Construct 60x60 Hangar	$396,600	$0	$0	$396,600
20	Construct FBO Building	$804,400	$0	$0	$804,400
21	Aquire Avigation Easement (8.72 acres) (Runway 12 RPZ)	$321,700	$16,085	$305,615	$0
22	Aquire Avigation Easement (9.18) (Runway 30 RPZ)	$102,100	$5,105	$96,995	$0
	Subtotal Phase II	**$7,051,700**	**$292,535**	**$5,558,165**	**$1,201,000**
Phase III (2017-2026)					
23	Construct partial parallel taxiway from apron to Runway 12 end	$254,600	$12,730	$241,870	$0
24	Construct parking lot near hangar area	$21,800	$21,800	$0	$0
25	Aquire Land (1.85 acres) (Landside Development)	$1,171,400	$58,570	$1,112,830	$0
26	Site Development (Taxilanes/Apron for 60x60 hangar)	$90,300	$0	$0	$90,300
27	Construct 60x60 Hangar	$396,600	$0	$0	$396,600
28	Site Development (Taxilanes/Apron for 8-unit T-Hangar)	$131,100	$0	$0	$131,100
29	Construct 8-unit T-Hangar	$840,200	$0	$0	$840,200
30	Construct Pilot Lounge	$116,500	$116,500	$0	$0
	Subtotal Phase III	**$3,022,500**	**$209,600**	**$1,354,700**	**$1,458,200**
Phase IV (Beyond 20 years)					
31	Conduct Environmental Assessment/Preliminary Engineering (Eastside Taxiway)	$150,000	$7,500	$142,500	$0
32	Develop Mitigation Site (32 acres) (for Eastside Taxiway Impts)	$2,437,400	$121,870	$2,315,530	$0
33	Aquire Land (8 acres) (Eastside Parallel Taxiway)	$177,500	$8,875	$168,625	$0
34	Construct East Side Parallel Taxiway	$1,302,800	$65,140	$1,237,660	$0
35	Construct Midfield Connector Taxiway	$24,400	$1,220	$23,180	$0
36	Construct 10-unit T-Hangar	$1,050,300	$0	$0	$1,050,300
	Subtotal Phase IV	**$5,142,400**	**$204,605**	**$3,887,495**	**$1,050,300**
	Cumulative Total =	**$17,309,400**	**$718,355**	**$11,021,045**	**$5,570,000**

* ELIGIBILITY FOR STATE FUNDING DOES NOT INSURE THAT FUNDS WILL BE AVAILABLE OR GRANTED FOR THE PROJECT.

- THE MAXIMUM ALLOWABLE LEVEL OF A WSDOT AVIATION GRANT IS $250,000

- ALL COST ESTIMATES ARE IN 2006 DOLLARS.

- TOTAL COSTS INCLUDE CONSTRUCTION, TEMPORARY FLAGGING AND SIGNING, CONSTRUCTION STAKING, TESTING, SALES TAX, ENGINEERING, ADMINISTRATION, AND CONTINGENCY, AS APPLICABLE.